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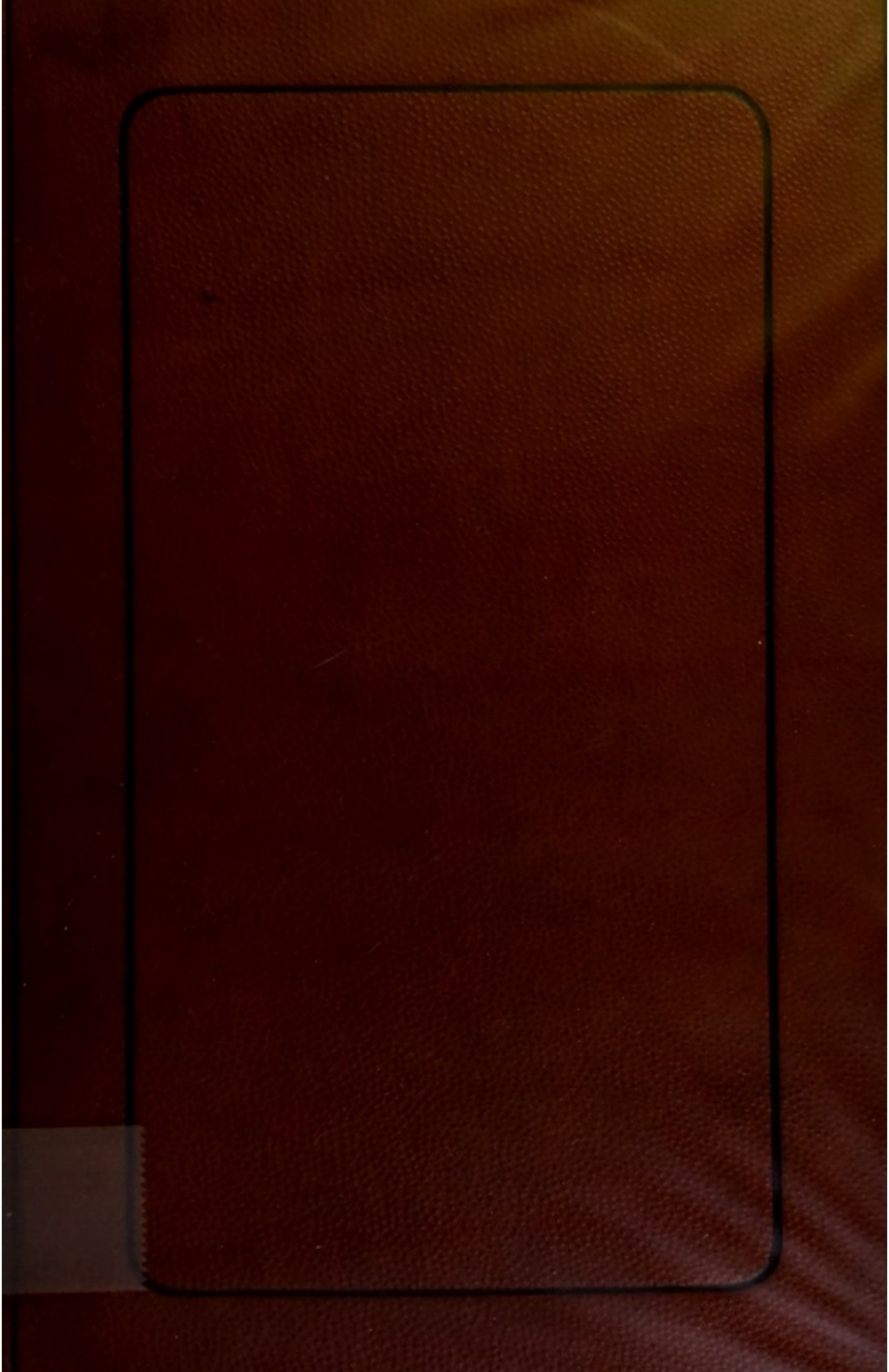
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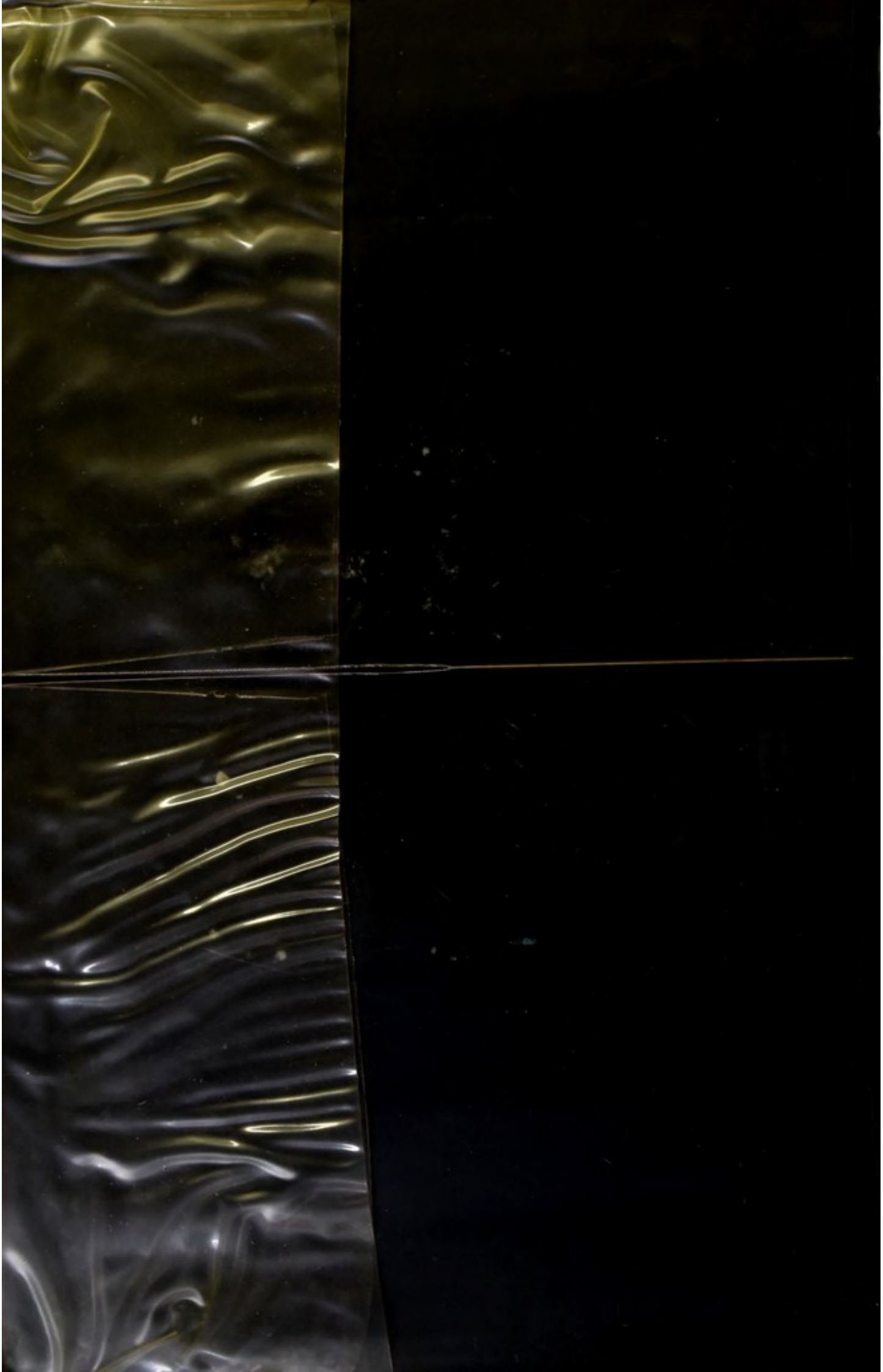
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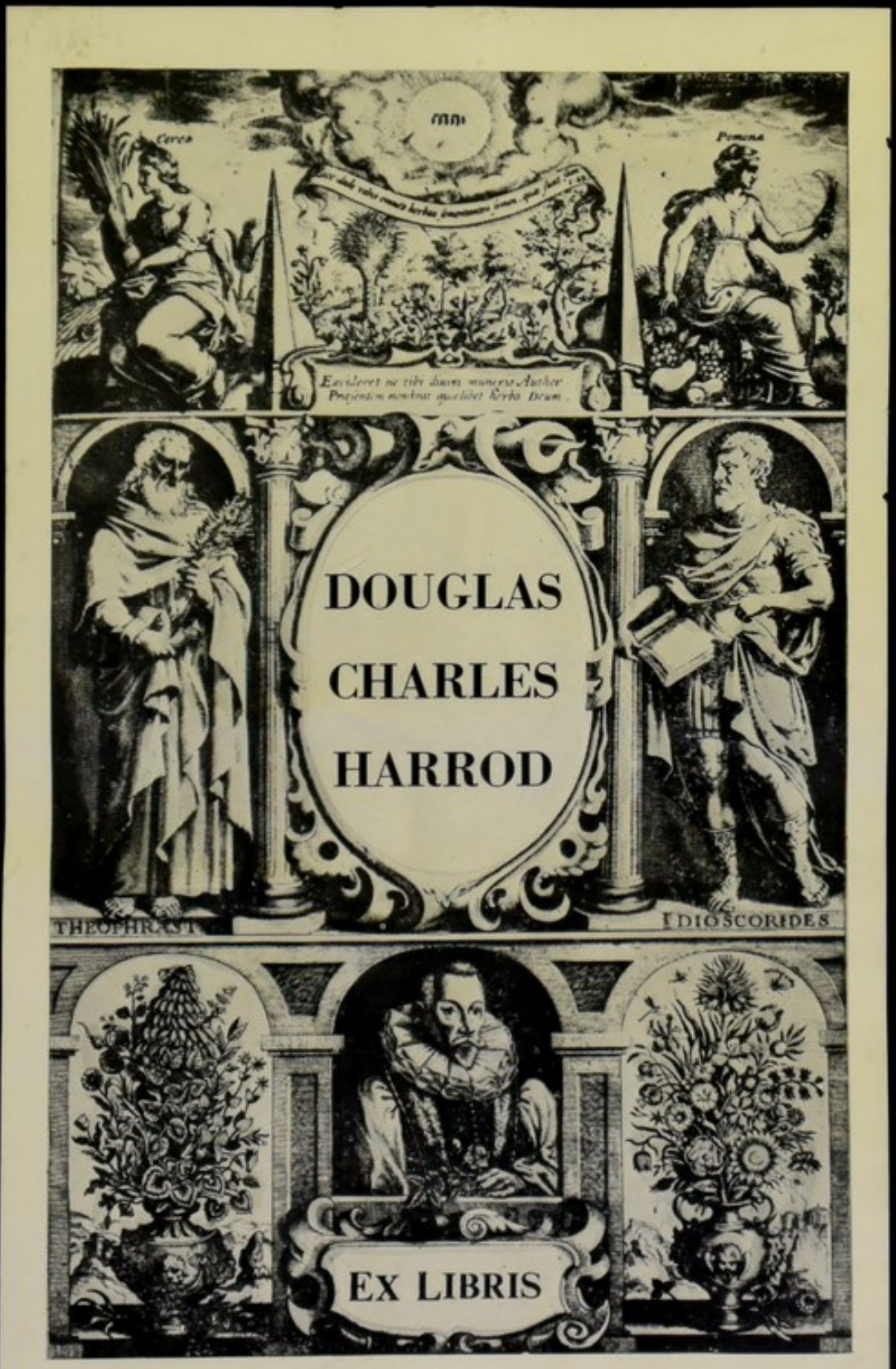
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Yours very faithfully

Dan.l Hanbury

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SCIENCE PAPERS,

CHIEFLY

PHARMACOLOGICAL AND BOTANICAL.

BY

DANIEL HANBURY, F.R.S.,

FELLOW OF THE LINNEAN, CHEMICAL, AND MICROSCOPICAL SOCIETIES OF LONDON;
MEMBER AND LATE EXAMINER OF THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN;
MEMBER OF THE IMPERIAL LEOPOLDINE-CAROLINE ACADEMY; CORRESPONDING MEMBER OF THE SOCIÉTÉS DE PHARMACIE OF PARIS, BRUSSELS, ETC.

EDITED, WITH MEMOIR, BY

JOSEPH INCE, F.L.S., F.C.S.

London:
MACMILLAN AND CO.
1876.

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J. Robert Scott

from his friend

Thomas Hanbury

La Mortola 20. Decr 1888.

THIS VOLUME

IS DEDICATED TO

The many Learned Societies

IN WHICH THROUGH LIFE

HANBURY FOUND DELIGHT.

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Since this Memoir was in print, the travels of Lieut.-Colonel N. Prejevalsky in Mongolia have appeared.

The Russian explorer penetrated into the province of Kan-su, and while there ascertained beyond doubt that the true rhubarb of commerce was *Rheum palmatum*, and not *Rheum officinale*, as had been supposed. The passage therefore relating to the identification of the plant cannot stand good.

Thanks are gratefully offered to the Linnean and Pharmaceutical Societies for permission granted to republish many of these papers; to the Secretary and Librarian of both Societies for their kind assistance; and to Dr. Hooker for the loan of a valuable private manuscript.

MEMOIR OF DANIEL HANBURY.

MEMOIR OF DANIEL HANBURY.[1]

One bright autumn afternoon, whilst the British Pharmaceutical Conference met at Exeter, a small party of friends went over the grounds that had belonged to the late Mr. Veitch. The visit was arranged in honour of Daniel Hanbury, the President for the year, who, on this particular day, was in his happiest mood. Amongst the noble collection of trees that were the pride of the West of England, a number were unknown to the new proprietor; Hanbury named them in succession, and described their habitat to the delighted owner.

One trying day, when at the London Board of the Pharmaceutical Society he sat for many hours as botanical examiner, it was noticed that he had never asked the same question twice.

I own then to feeling diffident in attempting to describe a man so profoundly master of his subject and of such admirable learning.

Early Life.

Daniel Hanbury was born on September 11, 1825, and entered into rest March 24, 1875. He was, therefore,

[1] Founded on the Memoir contributed by the writer to the *Chemist and Druggist*.

forty-nine years old when his earthly labours ceased. He was the eldest son of Daniel Bell and Rachel Hanbury ; his parents being both esteemed members of the Society of Friends. He left school early, and his great attainments in languages and in science were due entirely to his own industry. While at school he gained skill in water-colour drawing, an art which, when on his journeys, and specially at Mentone, he practised with assiduity. He had a delicate and graceful touch, and there was a beauty in these sketches which an artist would admire.

Plough Court.

At the bottom of Plough Court, which till lately was a narrow defile running out of Lombard Street, stands an old historic Pharmacy, whose reputation is inseparably connected with the name of William Allen. The philanthropist, though not the originator of the firm, was the first to create its celebrity. With him was associated John Thomas Barry, a man of infinite neatness ; exact in chemical experiment ; like Wollaston, fond of operating on minute quantities, and habitually trusting rather to self-obtained reactions than to information gained from books. The prestige of the former, and the example of the latter, influenced the life and practice of Daniel Hanbury, who at sixteen years of age began practical pharmacy in the well-known City firm of which his father was long the representative. At a much later period, the son was taken into partnership.

The career we are about to trace upset the theory which maintains that the pursuit of science is incompatible with the discharge of business duties. Daniel Hanbury was a good assistant, though a scholar ; and while the chosen correspondent of the learned, he served

in the Pharmacy, posted the ledgers, and was not unmindful that physicians' prescriptions should be accurately dispensed.

Report speaks also of his care in buying, and that his judgment was infallible in recognizing specimens we know from experience. In this department of knowledge he may fairly be classed with Guibourt.

Becomes a member of the Pharmaceutical Society.

In the year 1844 he entered as a student in the Laboratory at Bloomsbury Square, and was elected a member of the Pharmaceutical Society in 1857. Throughout his life he was engaged in promoting its prosperity, both in private and in an official capacity—though never on its Council—and he was a member of the Phytological Club (1852), of which Professor Bentley was President, and which was intended to foster a love of Botany among the juniors and the students.

Papers.

The commencement of his business life (1841) is coincident with the first publication of the Transactions of the Pharmaceutical meetings, to which he became a regular contributor. His Papers, many in number and invariably of the same character, date from January 1850, and as in his person, dress, and manner, there was no visible change between the opening of the Great Exhibition and the time of his decease, so this communication on Turnsole or Tournesol, though short, is constructed on the same framework as the *Pharmacographia:* it contains the same marshalling of facts and dates, the same citation of authorities, the same microscopic carefulness, while the last sentence might have been written yesterday:—

"In conclusion, it may be observed as a curious fact, that although formerly in general demand, turnsole rags appear to

have fallen into complete disuse everywhere but in Holland, in which country all that are now produced are consumed. Of the uses to which they are applied by the Dutch, we are still in want of more precise information."

Special Note-Books.

The secret of the construction of these papers, which were put together with laborious industry, is disclosed by the manuscripts he has left behind. In his library were found not only consecutive note-books, beautifully written and indexed, but others, each devoted to a special subject. Such for instance were—

I. Papers relating to *Rottlera tinctoria*, Roxb., and Kamala.

II. Notes on Turkish Materia Medica.

III. Papers relating to odoriferous species of Andropogon, chiefly East Indian.

IV. Papers relating to the Pharmacopœia of India.

V. Notes and Memoranda relating to Storax and Liquidambar.

VI. Notes on Cardamoms and various other Scitamineous Fruits and Seeds.

These contained memoranda, personal observations, letters, price lists, scraps from newspapers, and information drawn from commercial men, books ancient and modern, travellers, men of science, maps, and missionaries. Also notes and inquiries to and from young men who had obtained foreign posts and gone abroad. The complete series of his papers is over eighty in number; they are beyond criticism, and are uniformly original.

Scientific Papers.

Many have made their appearance in various scientific journals—English, American, and foreign. A reference has been given to such as have been translated in Buchner's *Neues Repertorium für Pharmacie*, Munich—a publication which Daniel Hanbury held in special esteem.

Abies excelsa.

His first paper (as distinguished from a journal article) was on the resin of the NORWAY SPRUCE FIR (*Abies excelsa*), and was read at an evening meeting, March 1, 1850, Mr. Peter Squire, President, in the chair.

Chinese Materia Medica.

His contributions to the history of CHINESE MATERIA MEDICA were probably his most elaborate venture in the path of continuous research; one series extended over three years, and was prized highly by competent authorities. Their scope placed them beyond the range of ordinary readers, and it is doubtful whether the best channel had been selected for their publication. A new edition of these *Notes on Chinese Materia Medica*, with additional notes, references, and map, is now given. The original pamphlet was translated by his friend and correspondent, Dr. Theodor W. C. Martius, into German in 1863, under the title of *Beiträge zur Materia Medica China's*. The work contained the illustrative engravings, but not the Chinese characters.[1] It was the practice of the chief writers for the Pharmaceutical journal to correct and arrange their own proofs. The printing-office was at the top of Beaufort Buildings, lately destroyed by fire. There, it is related by a contributor engaged on his own manuscript, that the conscientious printer Birtles was overheard loudly bewailing his fate. When asked the reason why, he replied that Mr. Hanbury had sent in some more Chinese, but a block not being properly marked, he was not sure of the right way of printing. "Chance it," was suggested. "No," said the old man; "that might do with other people, but Mr. Hanbury is *very* particular."

Birtles the old printer.

Brief indeed must be the running comment on his other contributions.

[1] Speyer, 1863. Druck von Georg Kranzbühler.

Storax. STORAX, begun in 1854, continued in 1857, and further considered in 1863, was an original research which was never absent either from his mind or notes. To elucidate its history formed one of the intentions of his travels in France and in the Holy Land. The solid Storax had been attributed, and Hanbury thought correctly, to the *Styrax officinale*, a plant answering exactly to the one Dioscorides. described by Dioscorides. Other authors, specially Duhamel and the Abbé Mazeas, confirmed this opinion. Repeatedly, Hanbury failed to obtain personal and ocular demonstration of the fact. "I am bound (he writes, 1863) to acknowledge that the endeavours I have Solid Storax. hitherto used to obtain the resin from trees in the South of France, Asia Minor, and Syria, have not been successful. In Syria it is now rare to find the Styrax forming anything better than a large bush, owing to the practice of cutting it periodically for fuel; and although I have myself examined many small bushes, I have failed to find upon their stems any exudation."

Great therefore was his exultation when walking in his brother's garden at Mortola, near Mentone (Dec 9, 1874), to find and to be able to collect some resin of *Styrax officinale* which exuded from the stem of a young tree.

Liquid Storax. With regard to Liquid Storax, continued investigations led him to assign it to *Liquidambar orientale*, Mill, not without the matter having been the subject of much controversy. James Pettiver had given a minute account of the collection of the liquid variety, stating that it was obtained from the island Cobross, at the upper end of the Red Sea. Dr. Landerer, of Athens, ascribed it to the *Styrax officinale*, and placed the spot of its production at Cos and Rhodes. The island

mentioned proved to be non-existent; while the British Consul at Rhodes, and Mr. Maltass of Smyrna, declared that Cos and Rhodes never had produced Storax.

The question was revived by a pamphlet by Professor Krinos, who maintained that Liquid Storax was known to the ancient Greeks—that both the solid and liquid were the produce of one tree; and he proposed to alter the text of Dioscorides in order to support the theory.

The arrival of specimens of leaves and fruits, from undoubted sources, settled Hanbury's doubts—and the crowning proof of the accuracy of the old Greek author was a conspicuous object in his Museum Specimens.

Cardamom Papers.

SOME RARE KINDS OF CARDAMOM, and the Linnean Paper written by Professor Oliver and himself on a NEW SPECIES OF AMOMUM, will prove how he had caught the spirit of Pereira, and how fit he was to follow in his steps. He worked on the *Zingiberaceæ* "as though he loved them;" amusing were his private comments on those who without much real learning had ventured on the intricacies of the theme; and had longer life been granted, Hanbury would have amplified and extended to the utmost a line of investigation which possessed for him a peculiar charm.

Peruvian Balsam.

The explanatory engravings which illustrate the manufacture of PERUVIAN BALSAM were supplied by Dr. C. Dorat, and represent the collection of the Balsam at Juisnagua, near Sonsonate. Previous to this occurs a paper of antiquarian interest, on the use of the Balsam in the preparation of the Chrism in the Church of Rome. For the sake of these Peruvian sketches he was induced to undertake Spanish, and was able to say in 1864, with regard to the *Description des Indes Occidentales, traduite de l'Espagnol* (Amst., 1622):—"I have also

consulted the Spanish edition published at Madrid, 1601–15"—a fact that of a surety pleased his mind; for it not only led him to an original source of knowledge, but took him back a few more years into the seventeenth century.

One thing is remarkable in these papers, that however recondite in their speculations, they so constantly land the investigator in distinct, reliable, and practical result. His barque was never showy, nor, though classic, did it ever indulge in painted sails—still less was it swift; but the steersman, quietly self-reliant, made straight for the destined port.

Gamboge.

In the "Botanical Origin of Gamboge" (1864) the source of the commercial article was traced to *Garcinia Morella;* that of *Savanilla-Rhatanhia* (1865) to *Krameria Ixina*, L. var. *β Granatensis Triana.* The Lesser Galangal (by the aid of Dr. Hance) to *Alpinia officinarum;* and the account of this, the *Radix Galangæ* of Pharmacy, was presented to the Linnean Society with accumulated historical illustration.

Practical results.

Varied learning.

Another specimen of his varied and curious learning is afforded by the short paper on "Penghawar Djambi," in which Dutch literature, old French and English poetry, German and Latin, Mr. John Smith and the British Museum, were pressed into the service of the writer.

Ipomœa simulans.

Tampico Jalap proved to be the root of a new species growing in the interior of Mexico, the *Ipomœa simulans.* In his father's garden at Clapham, this plant and the common *Ipomœa purga* could be seen side by side, where both their points of difference and similarity might be observed at leisure.

The *Ipomœa simulans* and the *Liquidambar orientale*

form the wreath round the marble medallion (an excellent likeness by Woolner) which now adorns his brother's house at Mortola, near Mentone.

He is supposed to have attached most importance to his essay on Calabrian Manna (August 14, 1872), a previous historical note on the same subject (1870), and Pareira Brava (1873). Yet, if general opinion be consulted, the warmest praise will be bestowed on a communication read before the Pharmaceutical Society on Wednesday, March 2, 1859, "On Otto of Rose." Mr. Morson occupied the chair, and there was not only a crowded, but a most appreciative audience. If I might venture to express the conviction of his hearers, it was, and remains, one of his happiest efforts, and exhibits his powers in their perfection. The research shown is great, the arrangement faultless, and the whole thing well done.

Knowledge of languages.

In order to prosecute these investigations, Hanbury had to acquire a sufficient knowledge of Turkish, and some notion of Arabic. To what extent this was carried I am not competent to judge, but that certain Oriental languages and Chinese, besides Spanish and modern Greek, were included in his studies, *litera scripta manet* —his own manuscripts will show.

Pareira brava.

The point at issue in the PAREIRA PAPER was that its botanical source was not *Cissampelos Pareira*, but that it is the root of *Chondodendron tomentosum*. The Pareira question, involving the spelling of the word Chondodendron *v.* Chondrodendron, gave rise to one of those exhaustive and rather overwhelming letters which he began to indite. He contended that a word which was backed by great weight of authority, that had been long in use, and had been a faithful servant in botany, might still satisfy the requirements of the present generation.

A similar missive was despatched to the *Academy*, and published April 3, 1875, in which he argues that the Linnean orthography of the word Cinchona may be maintained, though the Countess of Chinchon spelt her name otherwise, and Mr. Clements R. Markham followed her example.

Etymological discussions.

These discussions on etymology are not strange to many of his private circle ; still less his laborious efforts to arrive at the minutiæ of correctness. During the past twenty years his correspondence was filled with abstruse notes and queries. He argued out the orthography of inquire *v.* enquire, the duplication of *t* in accented and non-accented syllables, the meaning of Δια, as in Diarrhodon (*διὰ ῥόδων*), Diachylum (*διὰ χυλῶν*), and Diacurcuma—the translation of Myrepsus, the explanation of Spagiria and Spagyrist ; the source of Latin and Greek quotations—the correct interpretation of an unadvisedly selected motto, *Habenda ratio valetudinis*, and the term pharmacist, which at length he determined to adopt. Now, when it is recollected that his social position, his connection with pharmacy, his place as a scientific man, and his delight in travel, brought him into familiar contact with various classes of society, and that from all he diligently gleaned information, we may understand the wealth of his acquired stores of knowledge ; all of which, together with what he learnt from books, were devoted to rendering more full, accurate, and reliable the results of his own investigations. This is a specimen how he answered a casual note connected with Materia Medica :—

"If I were living at Shanghai I would certainly use my best endeavours to obtain the plants which yield good Chinese rhubarb, notwithstanding the fact that all persons who have

hitherto tried to do so have failed. Hankow is the city whence rhubarb is brought to the coast for shipment to Europe, and it is a journey of 600 miles from Shanghai; but it is by no means in the rhubarb country: no, that drug, or at least the best qualities of it, are produced in Kansŭh, 800 miles from Hankow, and in a region hitherto unvisited by Europeans." (October 24, 1868.)

Rhubarb.

Subsequently he verified the plant producing the rheum of pharmacy; grew a specimen in the garden at Clapham, and introduced its cultivation at Banbury. An authenticated specimen of rhubarb taken from the very spot of its production was sent to him for inspection, but it came too late.

It was with no affectation that he once wrote, "The fourth page of your note contains such a gross mistake about myself that I must correct it by assuring you that it is as hard as iron for me to compose a decent piece of English—in fact, quite impossible, unless it is written out two or three times."

Examiner for twelve years.

For twelve years (from June 1860 to May 1872) he was on the Board of Examiners of the Pharmaceutical Society, being, according to his own view, seven years too long: he considered a five years' tenure of office the furthest advisable period. During the whole time he confined his attention to Botany and Materia Medica. His strictly pharmaceutical work was limited, and it did not claim his first attention, though he compiled two volumes of autograph prescriptions. The one retained in his own possession was not remarkable. At the evening meetings of the Society he was a constant attendant, but not a speaker, for his was not the gift of the impromptu: all the more reason that we should give one specimen of what he thought about a subject that has again attracted notice.

"To most of your remarks on the subject of an Universal Pharmacopœia I cordially assent.

Universal Pharmacopœia.

"The idea strikes me as visionary, inconsiderate, unpractical. Consider how such a work might be made, and that it is to be equally suitable for Munich and Philadelphia, for Lyons and Liverpool. As it would be plainly impossible to get medical men and the public to abandon the Galenical formulæ they have been accustomed to, the Universal Pharmacopœia must contain a selection at least of those of all countries, and so become a very voluminous book. Or it must abandon formulæ altogether, and include only the simpler substances, such as carbonate of soda, corrosive sublimate, iodide of potassium, castor oil, and the like. In either case such a book would be practically useless.

"But there are so many reasons why an Universal Pharmacopœia cannot be, that it is difficult to select the most cogent.

"Pharmacopœias, as you say, do not *happen* to exist. They are formed to meet certain clearly defined requirements, and must differ according *to the habits* of the people who are going to use them, *the drugs* WHICH A COUNTRY PRODUCES, the climate, &c. The Indian Pharmacopœia, for instance, which is now being drawn up, is designed to afford to Europeans in India and to the many natives now being educated in the Government colleges, convenient formulæ for prescribing (*inter alia*) various drugs commonly found in INDIA.

"How could the idea of an Universal Pharmacopœia be brought to bear in such a case as this?

"A decimal system of weights and measures would obviously be applicable in all countries; but the Latin language is scarcely so expansive, though I have always deprecated it being abandoned in the British Pharmacopœia.

"You must not consider these hasty lines as either a 'notice' or a 'set paper,' though you can of course use them in whatever way you think proper." (March 26, 1867.)

It has been already stated that at the evening meetings of the Society he would sit a silent and apparently

an unmoved spectator, except when his own special subjects were introduced. Rarely, perhaps never, did he give the smallest utterance of opinion in public on political matters; and he shrunk like the sensitive plant from the touch of disputation. Yet, that this marked reticence was not to be interpreted as apathy, the quotation of these vigorous lines will show:

Principle *versus* Expediency.

"In reflecting on the scheme for admitting a number of persons without examination, I have *approached* (I will not say *arrived at*) conclusions different from those entertained by many of my friends.

"*Principle*, I think, ought to be placed above *expediency*. Now, did we not hold out to the world that on and after a certain date no one should be admitted a pharmaceutical chemist without examination? If we confer a title nearly equivalent to this (quite so, perhaps, in the eyes of the public), do we not practically break faith? It seems to me that this is one of the cases in which the majority cannot bind the minority, because the compact is, so to speak, made individually. A man says, 'I have spent my money and obtained this title on the distinct understanding that it was worth something, and that it could be got in no other way.' 'Ah, but,' say we, 'it would be a great advantage to the Society at large if you would give up this right you think so much of, or at least consent to share it with others.' 'But no,' he rejoins, 'I don't think so: let the others get it as I did, by paying for it in time and money; or let them be content to do without it.'

"Now it strikes me that this giving away of the rights of others *ought never to have been entertained* any more than the idea of repudiating one's debts: that however disagreeable, inconvenient, and apparently disadvantageous the compact existing between the examined pharmaceutical chemists and the Society may seem, it should be held *sacred*, and that it should never be made to give way on the plea of expediency. It is too much. like taking a wrong step in order to take a right one afterwards. But it will be urged, 'Would you miss the opportunity of

bringing all these outsiders into the fold?' 'Well, no,' I would say, 'I would admit them willingly if I could, only I cannot bestow on them that privilege which has been already conceded *exclusively* to others.'"

Elected Fellow of the Linnean Society, 1855.

We come in due order to that which was to him an unfailing pleasure—his election as Fellow of the Linnean Society, which took place in 1855. There he was supremely in his element; intimate with a great number of the Fellows, and held in unreserved respect. "The Linnean Society" (he says in an explanatory letter to a friend, January 21, 1867) "has been a source of much interest and pleasure to myself; and I look back with much satisfaction to the many pleasant hours I have passed within the walls of its meeting-room and library, as I have attended the meetings regularly, and not unfrequently brought to them some of my friends. I have formed a larger acquaintance among the F.L.S. than many who have been longer connected with the Society, —always an advantage, as tending to give to these gatherings a more social character." He frequently served on its Council; was actively engaged in the alterations which have been effected in the rather sumptuous arrangements of its library and meeting-room; and held the office of treasurer at the time of his death. An animated correspondence arose between himself and others of the Fellows respecting the best means to be employed in order to render the evening meetings at Burlington House at once more useful and more interesting. He was strongly of opinion that both objects might be effected.

Herbarium.

It is sincerely to be hoped that the Herbarium, to the arrangement of which he devoted many years, as well as his Museum specimens, may be allowed to remain intact.

It would be a grievous thing to see so valuable a collection dispersed in different directions.

Currey and Hanbury.

To the Transactions of the Linnean Society he contributed: "Note on *Cassia Moschata*" (H. B. et K.), xxiv. 161; "On the Species of Garcinia which affords Gamboge in Siam" (*G. Morella*), xxiv. 487; and, with Mr. Currey, "Remarks on *Sclerotium Stipitatum* and Similar Productions," xxiii. 93. Numerous other communications will be found scattered through the Journal of the Linnean Society.

Much laborious work was devoted to the compilation of the Pharmacopœia of India; and he had no inconsiderable share in drawing up the "Admiralty Manual of Scientific Inquiry."

Scientific distinctions.

I feel no desire to enumerate his various honours, seeing that they were never alluded to by himself; suffice it to say that he was a Fellow of the Chemical Society (January 21, 1858), and in 1869 was on its Council; that he was elected Fellow of the Royal Microscopical Society, June 1867; and that the crowning honour was bestowed also in 1867, when he was elected a Fellow of the Royal Society, and placed on its Council in 1873. Let him speak for himself: "For some time I strenuously refused to allow myself to be placed among the candidates for admission to the R.S., feeling that it would be invidious were the honour of membership conferred on a pharmaceutist who had really accomplished so little for science, and who had in many ways smaller merits than several others who could be selected. But it was urged, 'You must leave that to the judgment of your friends.' So this I did; and I do not know who drew up my certificate, and, with one exception, by whom it was signed."

Elected Fellow of the Royal Society, 1867.

In addition to his other better known distinctions, he could claim an alphabet of scientific titles, and he was Honorary Member or Correspondent of various learned societies; while the University of Munich made him an Honorary Doctor of Medicine.

Let us turn now to some more personal traits of character apart from immediate scientific work.

Friends and correspondents.

An old and beautiful adage says, "Tell me with whom thou goest, and I will tell thee what thou doest." Of this, no man was ever a more striking example than Daniel Hanbury. He did not affect the society of his brother pharmacists, but the *savant*, speaking whatever language, who could throw light on his cherished botanical researches, was welcomed as a brother. He has left behind him a voluminous correspondence, absolutely devoted to scientific subjects, and unrelieved by a solitary domestic detail. It is matter of regret that he allowed his fancy so little play, and that his sympathies were too severely restricted in their range. We must take him as he was, and as he meant to be; and recollect that he adhered to the motto he himself transcribed from Fourcroy, "Il faut que chacun ne fasse que ce qu'il sait faire."

Jonathan Pereira.

Chief among his companions was Jonathan Pereira, whose loss was mourned in 1853 by universal Pharmacy. Hanbury paid him the sincere flattery of imitation; the mechanism of his papers was directly copied from the object of his admiration.

With him may be associated Nicolas Jean Baptiste Guibourt, the dry little lecturer in the Rue d'Arbalète, who wrote learned books and had Materia Medica at his fingers' ends.

Next may be mentioned Señor Joaquim Correa de

Méllo, of Campinas, Brazil, for whose sake he learned Spanish, till when he had to trust to John Miers for the translation of his epistles. Such aid was not necessary when he received the welcome communications of G. Thuret, of Antibes; Gustave Planchon, of Paris; or Léon Soubeiran, of Montpellier. Amongst his cosmopolitan advisers, Moordeen Sheriff, of Madras, with his masterly "Supplement to the Indian Pharmacopœia" stands pre-eminent; not forgetting Dr. H. F. Hance, to whom he was largely indebted; W. G. Milne, of Old Calabar; Dr. Beke, famed for his Sinai expedition, or his widow who so courageously seconded her husband's difficult task. Literary friends.

To these might fairly be added as his intimates the chief scientific writers in America, and the distinguished members of the Linnean Society, notably its late President, Mr. George Bentham; Professor Thiselton Dyer; and a very near friend indeed, Mr. Frederick Currey, with whom, as with Professor Oliver, he jointly worked. Fellows of the Linnean Society.

It would be unjust to his memory to pass over his friendship with younger men, or that he gladly availed himself of the help of Mr. Broughton and Mr. C. H. Wood in quinology; or that of Mr. Charles Umney in laboratory details. Others pharmaceutically connected, indeed, but as well known in the world of science, were the objects of his regard. Such were Henry Bowman Brady, who had attained the same honours, and the two brothers, Henry Groves, of Florence, and T. B. Groves, of Weymouth. Quinologists.

How he was associated with Dr. Hooker and John Eliot Howard is as little necessary to state, as to chronicle his uninterrupted intercourse with Professor Flückiger, of Bern, L. A. Buchner, of Munich, or Professor

Richard Spruce and Colonel Yule.

Martius. The letters of Richard Spruce, the explorer of the Amazon and Rio Negro, as well as those of Colonel Yule, of Palermo, would each fill a decently sized volume. The latter writes thus :—"On your own account I should say, don't be in a hurry to finish your book [the *Pharmacographia*]. It is a delightful employment. Now I miss Marco Polo, and find other work very difficult." Such was the circle in which he moved, and which made him appropriate to himself the words, "*Acti jucundi labores, jucundior labor.*"

Children's Society.

Hanbury had other friends from whose minds his memory will not easily fade—these were little children. For them he had always a smile of welcome and a cheerful word ; and in their society he was as unlike a staid and grave philosopher as heart could wish. His way of interesting and amusing them was a sight to see ; he never talked down to them, but led them up to him, and yet the children's delight was perfect. At home, and in his study among the varied curiosities and specimens, in the garden showing them rare or beautiful plants, Hanbury was never more charming than when surrounded by a group of children.

Remark has often been made about the nature of his handwriting ; it formed part of his character ; it was legible to admiration—with no solitary flourish—each word stood in its own grounds, and there was plenty of breathing room between the lines—the ink always seemed black, and the printer was as glad to receive such copy as the individual reader.

A fac simile of his handwriting is here presented :—

Plough Court 31 Jan^{y}
1863

My dear —

The English members do not get this Bulletin. I spoke to one yesterday, who declared he had never seen it

However, I have acted for you as I sh^{d} for myself in similar case; — I have written to head-quarters, the Secretary of the Society. When his answer comes I will let

You know. —— Thanks
for the two samples of Incense.
That marked "Pascal Incense"
I have no doubt is in part
compound of Liquidambar
resin, — that is, Liquid Storax
(so-called).

Yours very sincerely
Dan'l Hanbury

British Pharmaceutical Conference.

He was a prominent member from the commencement of the British Pharmaceutical Conference, of which he was President, at Norwich in 1868, and at Exeter in 1869. That he should have accepted the position excited some surprise, for he was never credited with an admiration of popular assemblies; banquets he disliked, nor had his botanical researches led him to any practical experiments with *Nicotiana tabacum*. Nevertheless, he managed well, and made a good dinner speech at Norwich. Both his addresses were models of presidential discourses.

Chloral Hydrate.

It was at Exeter that, very early in the morning, with the aid of a small pocket dictionary, he translated the German description of chloral hydrate, being the first introduction of that remedy to an English public.

He served on the juries of the International Exhibitions of 1862 and 1867, in the former year being secretary to the jury on vegetable products, and in the latter engaged on *produits agricoles* (*non alimentaires*).

Exposition Universelle.

Seated round a social table, the guests were discussing the merits of the Exposition Universelle. Hanbury was amongst the number, but never a word spoke he. They discussed the paintings, the Napoleon statue, and the fine arts generally—still the oracle was dumb. Returning homewards with a friend, a sudden joy lit up the face of Daniel Hanbury. "I was fortunate, most fortunate," said he, "for, on arriving at Paris, I found out a workman's entrance to the dry goods department, and so I was never compelled to see the Exhibition once."

Paris work.

Reporting the Materia Medica of these Exhibitions overtasked his constitution: he did not husband his strength, and a voice of warning may be raised against this unwise strain upon mental and physical powers. At

the Exposition of 1867, he presented himself at the hour of opening, and never left until compelled to quit the building. To the fascinations of the gay city, even its innocent recreations, he was just as much a stranger as when botanizing at Naples he let Vesuvius continue its irruption without for a moment being diverted from his labours.

Cultivation of the French language.

It was matter of remark in his home circle how assiduously he made use of every opportunity of associating with French people for the sake of conversing in their language. They were often invited to his father's house, and he showed special interest in their society. He was seen to advantage when his thoughts were expressed in a language which he loved so well, and his style caught something of that charm which characterizes the graceful composition of our friends across the Channel. From this large section of his work, the following note is selected :—

"Londres, *le* 7 *Février*, 1863.

Letter to Dr. Allemao.

"Monsieur,

"J'ai reçu il y a trois jours avec beaucoup de plaisir, le paquet de plantes sèches que vous avez bien voulu m'envoyer par l'intermédiaire de M. Garrett, et je vous en rends grâce très sincèrement. Je vous accuse réception aussi de votre honorée du 5^{me} Novembre.

"L'échantillon de votre *Myrospermum Erythroxylum* bien qu'il ne comprend ni fleurs ni fruits, ne m'est point sans valeur. Si dans le temps il vous soit possible de m'envoyer deux ou troix légumes de la plante, j'en serais très reconnaissant. On peut bien les envoyer dans une lettre.

"L'autre *Myrospermum* répond assez bien au *M. toluifera*, H.B.K.; je suis très content d'en avoir un échantillon avec fruits. Les deux espèces de *Myrocarpus* m'ont fait beaucoup de plaisir.

"Si je puis vous aider d'aucune manière dans une affaire de science, surtout dans la botanique ou la pharmacologie, je vous prie de compter au moins sur ma bonne volonté.

Agréez Monsieur l'assurance de mes sentiments devoués.

"D. H.

"Mr. le Docteur F. F. Allemao."

Travels. He loved to travel on the Continent, and particularly in the district of Auvergne and the southern provinces of France, where he cultivated the society of every botanist of note; he spent a pleasant summer vacation with the late Professor Martius in Bohemia, and he was a frequent visitor at his brother's residence in Mentone. There he carried out those ideas of acclimatisation which he so well expressed in his first presidential address.

With reference to his tours, it should be mentioned that as far as possible he made personal observations on everything connected with his special studies in every locality he visited. Smyrna. At Smyrna (1854) he gained information about the collection of scammony and its trade; and owing to the kindness of Sidney H. Maltass, he was able to furnish interesting particulars. The striking characters of pure natural scammony were found to be—its pale yellowish-brown hue; its transparency; its great brittleness; its property of readily affording a white emulsion when rubbed with water; and the scanty amount of a white residue which it leaves on being treated with ether. Scammony resin is to be distinguished from scammony by affording hardly any emulsion when rubbed and wetted.

At Grasse and Cannes he noted the flower manufactures, and described the process of *enfleurage*.

Sicily. He went to Sicily (1872) on purpose to learn something about the production of manna, and at the same time

gathered authentic information on the cultivation of liquorice and the manufacture of the juice.

India. It was in serious contemplation, had his life been spared, for him to visit the East, and particularly India, with the view of investigating on the spot obscure points connected with the origin of certain drugs and other vegetable products.

These travels, almost without exception, were consecrated to the sole object of extending pharmacological research. Having set before him one definite line of action, he pursued it to the unwavering exclusion of other influences, and neither the charms of scenery nor historic associations, still less the voice of pleasure, could tempt him from his course. Better and wiser had it been for him to have carried his bow occasionally unbent, and to have indulged in some degree of relaxation amidst his severer occupations.

Hooker and Hanbury. Scanty recollections have, for the most part, been preserved of these scientific expeditions, but the events of the journey to the Holy Land have been recorded by his companion, Dr. Hooker. A brief outline of their tour will present some points of interest. Gaining Paris in the autumn of 1860, they found it in manifest prosperity, wonderfully beautiful and grand. Even in the Jardin des Plantes there was some improvement, but the chief sight was the gardening in the squares, bright with exquisite and rare plants. Palms and cycas growing in least expected places, in spots as secluded as in Soho Square; while in every part of the town the keep of grass borders, edgings, and shrubberies was perfect.

On September 15, the two friends, with Capt. Washington and others, left Trieste by the Austrian Lloyd's steamship *Vulcan* for Beyrut, *viâ* Smyrna. On board

were a troupe of opera singers and dancers, the former of whom beguiled the tedium of the voyage. A Chios merchant enlarged on the hateful nature of the Turkish government, a theme not unfrequently suggested by occurrences on the way; there appeared, indeed, to be an universal opinion that any material improvement was impossible except under foreign intervention. At Corfu they tried to get some fresh Zante grapes for the Museum, but found that they were quite unknown there in a cultivated state, being confined to Zante and Cephalonia, where they are grown extensively. They passed by the Adriatic to the Ionian Islands, amongst which is the small island of Paxo, where tradition says the news of the death of the great god Pan was conveyed to the crew of a Venetian ship simultaneously with the occasion of the sufferings of our Lord. The most interesting part was the narrow strait between Ithaca and Cephalonia: the scenery very rugged, and mostly covered with myrtle, laurel, arbutus, olive, and here and there clumps of evergreen oaks. Thence they went by the Strophades to the Arcadian coast; entered the Ægean Sea, and skirted the Island of Delos, the reputed birthplace of Apollo, and which contained the second oracle of Greece. Syra is reached—the great centre of Greek commerce, and famous for its schools, in which children are taught Greek, and little girls and boys read Demosthenes in a pure tongue. Hanbury and Dr. Hooker now exchanged the *Vulcan* for a very large iron screw steamer named the *Trebizond*, which was bound for Smyrna.

Voyage to the Holy Land.

Corfu.

Paxo, or Paxos.

Syra.

The party was most agreeable and very happy, but Hanbury was "atrociously upset."

The motion of the screw was execrable, making the whole cabin vibrate, and there was an abominable rattling

of chains overhead, which was not conducive either to quiet thought or literary composition.

Chios, or Khio.

Onward now to Chios, one of the many birthplaces of Homer; and though it may be doubtful whether it was there that the poet first saw the light, certain it is that the island is famous for mastich, grapes, and olives. Now

Gulf of Smyrna.

the travellers approach the magnificent gulf of Smyrna, all along the coast of which the sultana raisin is cultivated. The scenery is beautiful exceedingly: the green shore contrasting with the lofty rugged-topped mountains, covered here and there with scattered ranges of forest. But though Nature is sublime, the country was found in a horrible condition, with bandits close outside the town.

The richness of the botany of Asia Minor was a sufficient compensation for inevitable drawbacks. Smyrna itself has probably not less than 1,500 species in a radius of ten miles. There they saw olives with resin exuding, a sight which is *very* rare. Fig-packing was going on. Leaving Smyrna, with its wretched town, bad houses, and filthy, narrow streets, they sailed by *L'Impératrice* for Beyrût: passed the Ionian and Carian coast to Rhodes, and on Monday (Sept. 24) anchored off Cyprus, in which

Paphos the modern Bafa or Baffo.

is Paphos, renowned for wine and honey. Next day Lebanon was in sight as a splendid long ridge rising high out of the eastern horizon. Beautiful is the situation of Beyrût, at the foot of Lebanon, an undulating flat with rocky shore; the houses all nestling in green foliage of mulberry, ricinus, olive, and fig. Vines, date, acacia, plane, and poplar grow in the little gardens.

At the Hôtel de Bellevue they held conclave about a Dragoman, and selected Habeeb Somah, who had accompanied the Misses Beaufort. Mounted on most wretched

animals, they left Beyrût, being a party of eight riders, ten baggage horses and mules, and an escort, following the mountain route as marked on Van der Velde's map. They went towards the bay through lanes filled with Saccharum, Donax, Rose, Asclepias, and Rubus, crossed the river Berytus, and thence wended their course along the seashore. The setting sun and the grass-green of the curling breakers as seen by transmitted light were exquisite. Lebanon was sighted, and the travellers halted at Ain el Houran, a cold, naked, desolate place, without bush or tree, but tufts of Tragacanth, which yielded the gum abundantly; some flowers, and eternal Carduaceæ. The upper part of Lebanon they found to consist of red-bare rounded ridges, forming a great shallow amphitheatre: at the bottom of which is a broad flat, with low undulating hillocks on which the Cedars stand. These form one small clump like a black speck in the great amphitheatre, and there is no other tree or shrub visible near them. The wood is *intensely* hard and close grained. A fine log was sent to Kew. No doubt the persistence of the trees is due to the peculiar nature of the well-drained moist light soil of the stony moraine. Below, they found some nice plants and *Rhododendron ponticum;* also the *Tragacanth Astragalus*, with the gum oozing out: specimens of which were secured.

Ain el Houran.

The Cedars.

The Cedars, about 400 trees of various ages, stand on evident old glacial moraines, 6,000 feet in elevation, and occupy five or six hillocks. They are fifty to eighty feet high. The distinctive character of moraines consists in their being blocks of limestone of various composition, conglomerate, vesicular, and compact. Almost all Carduaceæ disappear above the Cedars. Berbery, Tragacanth, and Acantholinum are the commonest shrubs, with

small, pretty Crocus; some Alsineæ and Compositæ. No trees. Hanbury and Mr. G. Washington sketched and planned the Cedars. "The largest is forty feet in girth, and three others are also very large; all the largest are very old and branch from the very base. The smallest are about twenty-seven inches in girth, which by comparison of sections of older trees and rings would make the youngest about fifty years old. All are of much the same character; are short-leaved, not glaucous, dark green, and very horizontally branched. Several trees stand well apart from the group." [Dr. H.]

Two ascents of Lebanon were made, nor were the travellers slow to admire the superb character of the
Baalbec. view obtained from the summit. Baalbec was the next point of interest, and they camped in the hexagon of the great temple. They were lost in astonishment at the grandeur of the ruins, and the beauty of the moonlight.

They gazed on the splendid purple of Lebanon in the setting sun, and the orange of Anti-Lebanon—"splendid," Dr. Hooker remarks, "in spite of Turks and
Damascus. earthquakes." And now Damascus burst upon the view. What can be said in new coined language of the magnificence of its panorama; or of the beauty and lovely situation of the city? Immense valleys, rich, bright green trees, mulberries, figs, walnuts, aspens, poplars, vines, and cypresses. Under such circumstances it is difficult to avoid turning poet as well as a botanist. The city forms a winding stream of clay-coloured houses meandering through the velvet green, the lights and shades of which are admirable. Yet the city itself has no recommendation but its site: the lanes were very bad, and there were loads of Turkish soldiers everywhere. The two companions entered by low gates of

masonry, and proceeded a long way through wretched lanes, amongst still more wretched bazaars, to the "street called Straight," wherein was their hotel.

Great alarm prevailed amongst the Christians, who were all leaving after the massacre, and ruins piled four feet deep were in every lane; there were heaps of mutilated corpses, bones, and stench; burnt books and pictures; 3,500 to 4,000 troops; much sickness, dysentery, and diarrhœa. Amid such scenes, they went down their street, which is called, but is not, straight. Omitting the details of the route and the misery of the Jewish population, they came to Jerusalem: the Church of the Holy Sepulchre, the Place of Wailing, the Mosque of Omar, and the hundred other scenes which will remain memorable throughout all time. At Nablous, the ancient Sychar, the bigoted Moslem inhabitants cursed the travellers, and the boys jeered at them in the street. They visited the Samaritan synagogue, and went by a filthy town route, almost on hands and knees, along dark alleys, to the Chief Rabbi's house. He was a fine civil old man, who took them into a dingy chamber, and showed them the Samaritan Pentateuch. It appears, however, that a copy, and never the true, old book, is shown to strangers. So they were told at least by Professor Lewisohn, a Russian converted Jew, who had spent much time in Nablous. He has examined the original, and finds by the final letters of the columns that it is of the age of Phineas, son of Eli.

Jerusalem.

Samaritan Pentateuch.

At Nazareth their quiet was disturbed by groups of women and girls, who crowded round the well by hundreds, waiting to draw water. They camped amongst the olives near the well outside the town; all Saturday the disturbance was continued, nor on Sunday was the

Nazareth.

harmony less troubled ; from which the Doctor drew the inference, which was doubtless assented to by his friend, that in future it would be wise to leave well alone.

Hanbury now went with the baggage direct to Tiberias, and on October 30, 1860, the five weeks in Syria and Palestine were at an end. One sight worthy of mention remains to be described. Mr. Rogers, Vice-Consul (son of the celebrated deceased wood-carver), met them at Caifa,

Mount Carmel.

and offered to take both to Mount Carmel, the place of sacrifice. They left, accordingly, on Friday, Nov. 2, and ascended obliquely eastward to the top of the ridge. They found arbutus, hypericum, oak, and pine. They proceeded along mountain tops, opening up beautiful views to southward of valleys and the wooded coast. Plenty of quercus, with red galls, were found south of Safed, as well as the common oak of the country, but no valerian on the heights. The daisy was common in the Druse villages, and the *Laurus nobilis*, a small tree. At Esfia there were good houses, and the people were cleaner than usual ; but enormous manure heaps were left outside the village, resembling the slag heaps of Swansea, and they were never removed except by those natural scavengers, the wind and rain. There were a few olives, but little other cultivated forest trees, as they were both cut for fuel and burnt for manure, and the grass was

The Druses.

grown for sheep. These Druses are a strange race ; they hate the Jews least, the Christians less, and the Moslems most ; they believe in the transmigration of souls, and that the world was created with the existing number of inhabitants, who never alter in numbers.

The Place of Sacrifice.

At 1 P.M. (Nov. 2) the pilgrims arrived at the place of sacrifice, and gained a splendid view—the finest they had seen in Palestine. Gilgal, Gilboa, Jezreel, Little

Hermon, Nain, Tabor, and the Lake of Tiberias were displayed before them. The Mountains of Moab, Gilead, and Hauran, and the Nazareth Hills were conspicuous. They gazed upon Cana, Safed, and Acre, and the coast north almost to Tyre. Before them were stretched the plains of Zebulon, Esdraelon, and Sharon; the hills of Samaria and the coast south to Jaffa. View in Palestine.

They descended by the spring whence water was brought for sacrifice, to the place where the prophets of Baal were slain, and so home by Kishon to the foot of Carmel. Not unnoticed by the way were the gall-oaks, storax, and the laurels.

On Nov. 10 they anchored at Malta, arriving in four days' time at Marseilles. The journey being thus happily accomplished, need we wonder that even Hanbury, reticent in expression and measured in his admiration, sometimes drew a contrast between the attractions of foreign travel and the more sober realities of "a shop in Lombard Street." [Begun Sept. 15, 1860. Ended Nov. 14, 1860.] End of the Journey.

A pleasant memory reaches us from Florence. Hanbury once paid a visit to his good friend Mr. Henry Groves. The object of the Italian visit was to obtain information about manna, and also to see with his own eyes the various irides that grew in the neighbourhood. He stayed four or five days, and examined the drug stores of the city. Two miles distant, in the outskirts, grow the irides, in the grounds of the Certosa Monastery, and thither went the two companions to consider the lilies of the field. They were enabled to see the three species that yield the orris root, and Hanbury took specimens of the roots, and afterwards figured and coloured them at the house. Another day he called on Professor Florence. Orris Root.

Parlatore, the head of the Natural History Museum; another day he did precisely the same thing—that is, was absorbed in his favourite study, and "how well he knew how to set about it can be verified by those who have seen him at work: the methodical, searching questions which he placed to his informant were almost of the nature of a cross-examination, so desirous was he of eliciting the whole history. Nor was his precision confined to study, but in the house the servant remarked the methodical way he had in disposing his garments, and could not help exclaiming, in her Piedmontese dialect, 'Giusmaria! questo è un Sior per ben!' He was very abstemious at meal times, and could never be persuaded to take more than he thought good for himself under any circumstances."

Order and precision.

Popular work.

His strictly popular work was confined to a paper on "Prices," in the Almanac of the *Chemist and Druggist;* "Details respecting Frangipani," in *Notes and Queries;* occasional remarks in the *Athenæum;* a paper (reprinted afterwards) in *Ocean Highways*, "On the Botanical Origin of Myrrh;" a note, often quoted, "On the Adulteration of Saffron;" a paper read before the Phytological Society (1858) "On the Botany of the Col de Lautaret;" and a sketch read at the Bath Conference (1864), called a "Chemist's Holiday-Jottings in France," in which, *inter alia*, he describes a visit to the Alps of Dauphiny, and the Monastery of the Grande Chartreuse. He did not fail, however, to remark the firs, pines, and turpentine; nor the larch manna of Briançon, with its peculiar sugar called Melezitose.

Life of Jacob Bell.

Mr. Hanbury was the author of the "Sketch of the Life of Jacob Bell" which appeared in September 1859. Both the biographer and the subject of the memoir were

cut off, "alas! at the early age of forty-nine years:" both were in the fulness and brightness of their powers; both actively engaged when the last summons came.

Memoir of Countess of Chinchon.

His very latest work is a review of Markham's "Memoir of the Countess of Chinchon," to which allusion has been already made. His last sentence is as follows: "It is now several years since Mr. Markham lifted up his voice against this corruption [the Linnean spelling of the word CINCHONA], or, as he terms it in the present work, 'this ill-omened mutilation of the Countess's name;' but hitherto, it must be confessed, with but small effect. The new spelling has, indeed, been adopted in the official documents of the Indian Government, but it scarcely finds acceptance in a single scientific work on botany or chemistry." There is also a posthumous paper in one of the Camden Society's publications, treating of the accounts of the executors of Richard, Bishop of London, A.D. 1303, and Thomas, Bishop of Exeter, A.D. 1310.

London Institution.

We must not forget to mention that he aided in the direction of the affairs of the London Institution, and was at home in its admirable library. The librarian (the late John Cargill Brough) had a host of pleasant and most characteristic recollections to relate respecting him. One was the famous instruction given to a visitor who wished to consult a work: "You will find the book up in the gallery; it is the second from the left-hand side from the door, on the bottom shelf. The librarian is a most obliging person, and be sure and ask him for a duster." Those who have ever penetrated to those upper regions will acknowledge the necessity for the advice.

The books treasured in his library at Clapham were

Library at Clapham.

not many, but well selected. There were the whole series of botanical works, such as might have been expected in the library of any worshipper of Linneus, and numerous presentation copies of standard treatises, as was also natural. There were rare editions of celebrated authors, some of great value; a few specimens of the art of printing. There were Latin volumes of travel, and the narratives of the early Dutch, Portuguese, and Spanish explorers. The classics—French, German, and Italian literature—were included; while pamphlets that were either remarkable or unique, were clothed with costly and sometimes curiously devised bindings. These luxurious clothings were bestowed on single, not on collected tractates. And there stood the well-read and constantly exhibited work of his friend Colonel Yule, "The Travels of Marco Polo," which was seldom *in* his library, and was described to admiring visitors with warm praise; then there were the Latin folios, a fine copy of the "Medicæ artis Principes," Matthiolus, Avicenna, Galen, Valerius Cordus, and other ancient worthies; lastly, School Lexicons and Dictionaries of most elementary character, a few theological disquisitions, and so the total is complete.

Mexican fungi.

An admiring botanical friend, with whom he had long corresponded, but whom he had never seen, bequeathed him his collection of water-colour drawings of the Mexican fungi. These were executed in a superior manner, and went to enrich his store of art illustrations of his favourite studies. Besides, he had in his possession a large assortment of photographs and sketches which belonged rather to the portfolio of the traveller than to the pharmacologist, and maps coloured for special purposes.

In 1870, Hanbury went to Mortola for a short time to superintend the estate of his brother Thomas, during the temporary absence of the latter in China. Judging from his letters he became head gardener as well as director-general. When there, commiserating the condition of the Italian coast-guard on that part of the shore, he ordered from Florence a small collection of books for their amusement and instruction. These were chiefly translations of well-known English works. The gift was duly acknowledged by the official thanks of the Italian Government.

Italian coast-guard.

It is due to the fine character of Daniel Hanbury to reveal the source of his unbroken equanimity—a deep spirit of devotion which found its expression, not in outward declarations, but in the uniform tenor of his life. Sometimes, indeed, the angel troubled the waters, and he was not afraid to give utterance to the sentiments of his heart—once more especially, when in an earnest conversation he contended for the spirituality and the vital influence of the communion of which he was a member.

Private Character.

No pressure of literary work was allowed to interfere with his morning's reading in the Tauchnitz edition of the New Testament. His name is absent from the lists of charity, but in works of benevolence he was munificent. A constitutional reserve of manner did him perpetual injustice. He will be mourned longest and the most sincerely by those who were his associates, and by those whom his open-handed generosity relieved in their hour of need.

Happily, the lamented early death of Daniel Hanbury did not take place before he had finished his great work in association with Professor Flückiger, called the

The Pharmacographia.

Pharmacographia. This was his most important undertaking, except his share in the compilation of the "Pharmacopœia of India." The title was not accepted hastily, nor without revision: "Britannica" and "Nova" being at first suggested as additions. Neither did the form of its publication meet with universal approval, some objecting to the severity of its binding and the narrow margin of the page. He replied that an *edition de luxe* had not been in contemplation. Others thought that the absence of illustrations of microscopical structure was a deficiency, an opinion to which he heartily assented. The two following memoranda taken from his note book will be read with interest :—

Opinoins respecting the *Pharmacographia.*

"1873. $\frac{25}{\text{xi}}$. Left with printer the first portion of MS. of *Pharmacographia.*

"1874. $\frac{11}{\text{ix}}$. On the evening of this day (my 49th birthday) I made the last correction, and returned to the printer the Preface and Index for press."

The origin of the *Pharmacographia* is thus described by Professor Flückiger :—

Flückiger's account.

"Finally, Hanbury's separate investigations were followed by a comprehensive work in which he displayed his best labours. His views on Incense had led in 1864 to an acquaintance with Flückiger, which from their first meeting in 1867 became the closest friendship. From that time forward they occupied themselves in working out in common the same questions, which resulted in the thought of arranging their conclusions in a perfectly systematic form. To this they were incited by the fact that English literature could produce no work answering to the views of the two friends. The task was taken in hand, and carried out both by writing and by word of mouth.

"All that was possible was done to elucidate those doubtful

points of a practical and scientific nature which cropped up in unlooked for abundance."

It remains an imperishable memorial of his accurate research, of his varied reading, and the profound knowledge of his subject. With it we may safely leave his reputation, and it forms a worthy termination of his unwearied diligence. He was a man who devoted himself to one book of Nature, but left no leaf uncut and no page unstudied. He was blameless and most kindly in private life, without a shade of ostentation; one to whom might be applied in their full significance the words—

"Cui Pudor, et Justitiæ soror,
Incorrupta Fides, nudaque Veritas
Quando ullum inveniet parem?"

Some may read with a certain interest this brief memorial, but by none would it have been perused with more affectionate sympathy than by the mother who so soon was called to follow her distinguished son.

Hanbury Gold Medal.

Professor Dragendorff, of the University of Dorpat, and others, unwilling that a life consecrated to science should pass uncommemorated, have proposed that a gold medal, bearing the name of Daniel Hanbury should be awarded annually as the highest distinction Pharmacy can bestow.

The medal to be adjudged to a scientific man, of whatever nation, who has especially distinguished himself by genuine original research in the domain of Pharmaceutical science; or better still, the natural sciences that have a bearing upon Pharmacy. "I incline to the opinion,"

Professor Dragendorff.

says the Professor, "that our science is confined to no single nationality, and that consequently he who labours for the advancement of Pharmaceutical science acquires an international importance. Just such an eminent international position, I think, had Hanbury taken. An Englishman by birth, he lived and worked for all civilized peoples."

An additional claim to our respect is that Hanbury triumphed over social temptations; his surroundings whispered to him, Soul, take thine ease; but, proof against seduction, he strove and toiled as though necessity had been his strong incentive.

Those who think that easy circumstances and leisure are favourable to intellectual effort are tremendously mistaken. Hanbury worked on laboriously in spite of his pastoral life at Clapham or success in Lombard Street. And so an English name has been added to the list of those whom men hold in honour.

SCIENCE PAPERS,

CHIEFLY

PHARMACOLOGICAL AND BOTANICAL.

SCIENCE PAPERS,

ON TURNSOLE.

1850.

ALTHOUGH the subject of these remarks may by some be considered more to concern the dyer than the pharmacist, I trust that, taken in connection with another substance well known to chemists, and often confounded under the same name, it may not prove altogether devoid of interest.

Turnsole, or Tournesol, is a name applied to two[1] articles of different origin. The one is the Litmus of English chemists (*Tournesol en pains* of the French), a blue substance imported from Holland, and believed to be derived from some species of lichen. The property possessed by its solution, of being changed by acids from blue to red, is its most important character.

Turnsole Rags.

The other species of Turnsole, and that on which I propose to offer a few remarks, is called Turnsole Rags (*Tournesol en drapeaux*). It is sold as pieces of very coarse hempen cloth, of a purplish black colour. Steeped in water (which readily extracts all the colour) we obtain a bright purple solution, which is reddened on the addition of an acid or of an alkali. The plant affording this colour is the *Croton tinctorium*, Linn. *Crozophora tinctoria*, Endl., and *la Maurelle* of the French. It is indigenous in the south of France, and has been cultivated

[1] The "Turnesol *in linen*" and "*in cotton*," of Pomet, being manifestly different preparations, and no longer objects of commerce, are excepted.

1850. for use since the year 1833, previous to which time the wild plants only were collected. The locality where the cultivation is carried on is restricted to the neighbourhood of the small town of Grand Gallargues, in the department of Gard.

Manufacture. According to J. P. Hugues, to whose pamphlet (*Une Excursion dans la Commune de Grand Gallargues dans* 1835: Nismes, 1835), and a personal visit to the spot during the past autumn, I am indebted for most of these particulars, the plants, which vary from six to eight inches in height, and whose seeds are developed though not ripe, are cut in the month of August, ground to pulp in a mill, and the juice, which amounts to about half their weight, expressed. This juice is at first of a dark green colour, but speedily assumes a purple hue by simple exposure to the air. In it the cloths (which are merely pieces of coarse sacking carefully washed) are soaked, dried, exposed to the vapour of ammonia derived from a heap of stable manure or some similar source, and immersed in another portion of juice with which a quantity of urine has been mixed. A second drying completes the process.

In this state the Turnsole is purchased by dealers, packed into large sacks, each capable of containing four quintals, and carried to the neighbouring ports, whence it is shipped to Holland.

Use of Turnsole. But little is known of the purposes for which Turnsole is purchased by the Dutch. According to the author before quoted, its use is confined to colouring the exterior of cheese, though it was formerly thought to have served in the manufacture of blue paper, the colouring of wine, and confectionery. Pomet, in common with other old authors, imagined it formed the colouring matter of litmus, an opinion since entertained by Guibourt (*Histoire des Drogues Simples:* Paris, 1836), but relinquished in a subsequent edition of his works. Dr. Ure states the name Turnsole to have been applied to litmus in order to conceal the true origin of the latter substance.

The manufacture of Turnsole has been carried on in the south of France from an early period. Pena and De Lobel (*Stirpium Adversaria Nova:* Lond., 1570) correctly describe the

plant and its locality, and mention its employment both in medicine and for dyeing. It is also described by Pomet, and figured in the English translation of his *History of Drugs*, printed in London in 1737. Pliny alludes to it under the name of *Heliotropion tricoccon*. 1850.

In conclusion, it may be observed as a curious fact, that although formerly in general demand, Turnsole rags appear to have fallen into complete disuse everywhere but in Holland, in which country all that are now produced are consumed. Of the uses to which they are applied by the Dutch we are still in want of more precise information.

Note addressed to Pereira on Dutch Cake Litmus.

LONDON, 7*th of* 12*th mo.*, 1850.

MY DEAR DR. PEREIRA,—Some months ago I was favoured by thee with the sight of a specimen of litmus said to be free from indigo, which thou hadst recently received from Holland. It was in much larger cakes than the ordinary kind, and of not nearly so fine and deep a blue colour. This induced me to examine two samples of litmus received by our house from Amsterdam in 1846, one of which agreed in its characters with that above-mentioned, while the other was of the usual sort, and of excellent quality. Samples of Litmus.

1. The first of these, which I have since called *litmus without indigo*, afforded no crystals of indigo on being carefully heated. Its aqueous solution was of the usual intense purple, and the residuum when deprived of all the colour cold water would extract, was of a fine deep blue colour.

2. The second sample, *litmus containing indigo*, on being heated in a capsule, afforded the small copper-coloured crystals so characteristic of indigo. The aqueous solution possessed nearly the same amount of colour as the other, and of almost the same tint. The residuum was also deep blue. Neither Prussian blue nor cobalt could be detected in either sample.

The remarkable point, however, in the history of these samples is, that the value of the litmus in large cakes (No. 1) is so much greater than that in small cakes (No. 2) that the difference in favour of the former amounts to more than 50 per cent.

It is no easy matter to say what is the cause of this singular variation in price, as the *cheaper* litmus is of *better* appearance, and affords an amount of colour of similar richness, very nearly

1850. equal in intensity to that of the other sort. Almost the only difference that could be detected in these two samples (excepting the absence of indigo in one) was, that the residuum of No. 1, when coloured with an acid, was of a finer red than that of No. 2 similarly treated. This doubtless arose from the indigo in the latter partially obscuring the red colour.

Various qualities of Litmus. Accompanying these samples, which were from one of the most respectable litmus manufacturers at Amsterdam, our correspondent sent the price current of another maker, which I inclose for thy inspection. It offers no fewer than twenty-three different qualities of litmus, the cheapest of which is but a ninth part of the value of the most expensive. We were however informed (as we might indeed have easily supposed) that several of the lower qualities of this manufacturer were far from genuine.

I remain, very respectfully thine,

DANIEL HANBURY.

[The price current referred to was that of Jan Dekker, of Wormerveer, in Holland.]

ON THE RESIN OF THE NORWAY SPRUCE FIR.

(*Abies excelsa.*)

IN the Materia Medica of the London Pharmacopœia two forms of the resin of the Norway Spruce Fir (*Abies excelsa*) are enumerated: one, *Abietis resina*, called Common Thus or Frankincense; the other, *Pix abietina*, or Burgundy pitch. The latter is stated to be the resin in a prepared state (*Resina præparata*); the preparation essentially consisting in the removal of the impurities by straining.

Abietis resina. The first of these substances, viz., *Abietis resina*, is rare in English commerce, and it was not until during a recent visit to Switzerland that I had an opportunity of obtaining an authentic specimen. In many parts of that country this species of *Abies* is very abundant, forming extensive and beautiful tracts of forest. The resin exudes spontaneously from fissures in the bark of the tree, and especially from those places where branches have been broken off. When it first issues, it is

1850.

sometimes quite transparent and liquid, but is more commonly found opaque, and of a pale yellow colour and soft consistence. By exposure to the air, it hardens and becomes of a browner tint. Some of the hardened tears are internally white and opaque, like drop ammoniacum, the broken surface acquiring a pink hue by exposure to the air. The odour is peculiar, terebinthinate, cheesy, and rather aromatic; the taste slightly bitter.

Abietis resina.

The article now sold as *Abietis resina* is believed to be imported chiefly from America, and in odour and colour much resembles common American turpentine hardened by age. It usually occurs in large agglutinated masses, whose surfaces when long exposed become transparent, brittle, and of a deep yellow colour. Internally, they are soft and opaque, pale yellow marbled with whitish patches. The odour is that of common American turpentine, though not so powerful. Some of this resin appears to have exuded spontaneously, and contains such impurities as small chips of wood, sticks, and leaves. The leaves are evidently not those of the Norway spruce fir.

Burgundy Pitch.

When genuine *Abietis resina* is melted in hot water, strained and cooled, we obtain Burgundy pitch, as a very pale, yellowish brown substance, almost entirely soluble in cold alcohol, easily softening in the hand, and having a peculiar, agreeable, aromatic odour. Burgundy pitch, apparently genuine, is imported from Hamburg in tubs called *stands*, each containing about one hundred pounds, but it is usually in so impure a state as to require straining, sometimes a rather difficult process involving considerable loss. It is moist, of a greyish buff colour, speedily becoming dark on the surface by exposure to the air; when strained it acquires a browner hue, and is very adhesive. It was formerly called Rhine pitch, to distinguish it from another imported variety now seldom seen, which was designated Baltic pitch.

Baltic Pitch.

Baltic pitch is a brittle resin, externally transparent, and of a bright yellowish brown colour, internally pale buff, and very opaque. Its odour is slight but agreeable, though wanting the peculiarity of that of genuine Burgundy pitch. I know not its botanical origin.

1850. Artificial Burgundy Pitch.

Artificial Burgundy pitch, apparently intended as an imitation of the sort last described (since it strikingly differs from the Hamburg or genuine sort), is manufactured in London and elsewhere, and is sold in bladders, as a clean, brittle resin, very moist, of a fine orange yellow colour, and having but little odour and taste. It does not completely dissolve in cold alcohol.

Other varieties of spurious Burgundy pitch are employed on the Continent, but as they do not occur in English commerce, it seems unnecessary here to describe them.

In answer to some questions, which were asked in the discussion which followed the reading of the paper, Mr. Hanbury stated that he believed the resin of the Spruce Fir was not collected as an article of commerce in the districts which he had visited, and from which he had obtained his specimens. The trees grow to a considerable height, often more than a hundred feet.

ON BURGUNDY PITCH.

Burgunder Harz (von *Abies excelsa*).

1867.

The authors of the British Pharmacopœia have defined Burgundy pitch (*Pix Burgundica*) as *a resinous exudation from the stem of the Spruce Fir, Abies excelsa* DC. (*Pinus Abies* L., *P. excelsa* Lam.) *melted and strained.* They have thus followed the London College of Physicians, which for nearly a century and a half has included this substance in its Materia Medica, indicating in the later editions of its pharmacopœia a similar botanical origin.

Dr. Berg.

On the Continent the term *Pix Burgundica* (which is not frequently applied) appears to have a less definite signification than with us, being used synonymously with *Resina alba* to designate the resins of various coniferous trees after purification by being boiled in water and strained. The following description is translated from one of the more recent and esteemed works on pharmacology, that of the late Dr. Berg.[1]

[1] *Pharmazeutische Waarenkunde*, Berlin, 1863, p. 566.

White Resin, White Pitch, Yellow Resin, Yellow Pitch [*Weisses Harz, weisses Pech, gelbes Harz, gelbes Pech*], Resina s. Pix flava s. citrina. 1867.

It is obtained by melting common resin with the frequent addition of water and subsequently straining. According as the melting has lasted a longer or shorter time, the resin remains paler in colour and constitutes *White Resin*, or becomes darker and is called *Yellow Resin*, and is thereby richer or poorer in oil of turpentine. The first, owing to the water which it contains, is almost entirely opaque, white, brittle, and becomes gradually yellow. The second, through the formation of a little colopholic acid by reason of the longer melting, is of a yellow, dark yellow, or brownish colour, very brittle, here and there clear, and has a conchoidal glassy fracture. An inferior kind, called *White Pitch*, is obtained from the resin that is first produced in the manufacture of tar, and has a brownish-yellow colour. The true *Burgundy Resin* or *Pitch*, *Resina s. Pix Burgundica*, is the similarly prepared resin of *Picea excelsa* and *Pinus Pinaster*, which is brought into commerce in the form of dull, dirty-yellow brittle masses of a glassy fracture, softening in the hand. Ordinary Burgundy Pitch is White Resin which has been gently melted for a short time without the addition of water, so that it is in fact freed from a part of its water, but has not yet acquired the brown colour of colophony. Dr. Berg.

In France as in England the term *Burgundy Pitch* (*Poix de Bourgogne*) is by the more accurate writers restricted to the melted and strained resin of the Spruce Fir, of which substance the following description is given in the last edition of the Codex:— Codex.

[*Translation*].—Burgundy Pitch is of a brownish yellow, solid and brittle in the cold, flowing when warm, very tenacious, having a peculiar odour, and an aromatic taste without bitterness; not completely soluble in alcohol in the cold. There is frequently substituted for it another product called white pitch [*poix blanche*], prepared with *galipot*[1] or a mixture of yellow resin and Bordeaux turpentine, melted and mixed with water; this artificial pitch has a strong smell of Bordeaux turpentine and a very marked bitter taste. It is entirely soluble in alcohol.

[1] (*Note by translator*).—*Galipot*, dry resin collected in France from the trunks of *Pinus maritima*, Lamb.

KING'S COLLEGE LONDON

1867. Where then is true Burgundy Pitch manufactured? Is it actually met with in commerce? By what characters may we judge of its purity?

The authors of the British Pharmacopœia mention it as a production of Switzerland, where the Spruce Fir is certainly found in great abundance. But I have it upon excellent authority, that of my friend Dr. Flückiger of Bern, that at the present time no terebinthinous resins are collected in Switzerland for commercial purposes. Neither is true Burgundy Pitch produced in France, as its name would seem to indicate, *Pinus maritima*, Lamb., being in fact the only tree the resin of which is collected in that country as an industrial product.[1]

Knowing these facts and having failed to gather any precise information from pharmacological writers as to the districts where the resin of the Spruce Fir is an object of industry, it was with some interest that I examined the various collections of forest-products in the French Exhibition. Nor was I disappointed, for among the contributions from Finland, I discovered a suite of specimens illustrating this very subject. Baron Linder, of Svarta, near Helsingfors, is the exhibitor of the resin of the Spruce Fir in two forms, namely:—

Baron Linder. 1. The crude resin as exuded from the trunk of the tree and described in the following words: "*Barras* ou gomme concrète, adhérente aux sapins (*Pinus Abies*). Produit brût servant à la fabrication de résine, etc. etc.—Prix 12 francs les 100 kilogr."

2. The resin purified by melting in contact with the vapour of water, and straining. It is thus described on the label attached to the specimen: "*Résine jaune* cuite (à vapeur d'eau à chaleur modérée) de *barras* de sapin (*Pinus Abies*). Prix 40 francs les 100 kilogr.: production annuelle 35,000 kilogr."

[1] The name *Burgundy Pitch* seems in fact to be a complete misnomer, no such substance having been ever produced in Burgundy. Pomet, writing in 1694, thus speaks of "*Poix grasse ou Poix blanche ou Poix de Bourgogne*":—

"On fait fondre le Galipot avec tant soit peu d'huile de Terebenthine, et de la Terebenthine commune, et ensuite c'est ce que nous appelons *Poix grasse*, ou *Poix blanche de Bourgogne*, à cause que l'on prétend que la meilleure et la première s'est faite à saint Nicolas en Lorraine: ce qui est tout le contraire d'aujourd'hui; car la meilleure Poix grasse vient de Hollande et de Strasbourg, d'où nous la faisons venir."

Of these two resins, the first is not found in English commerce:—the second constitutes genuine Burgundy Pitch, precisely such as may be bought in the London market. The quantity of this purified resin produced annually, it will be observed, is very considerable, being equivalent to 77,000 pounds, or more than 34 tons weight. Baron Linder is likewise an exhibitor of the crude resin of *Pinus sylvestris*, of the same in a purified state, of Oil of Turpentine, Iceland Moss, and a few other productions of Finland. 1867.

The Paris Exhibition shows that true Burgundy Pitch is also produced in Germany. Mr. J. G. Müller of Löcherberg, near Oberkirch, in the Grand Duchy of Baden, has taken the trouble to exhibit an instructive and complete series of large specimens in illustration of the products of the Spruce Fir, comprising:— J. G. Müller.

1. Portion of a stem of *Abies excelsa* about four feet long, treated for the production of resin. This stem has had cut in it longitudinally at equal distances, four even and regular channels, an inch and a half wide and of the same depth; from the sides of the channels, the resin exudes and is scraped off with an iron instrument made for the purpose.

2. The crude resin (*Roh-Harz*) as scraped from the stem, contained in the original triangular bark-basket used in the country.

3. *Wasser Harz.*—This has been obtained by boiling in water and pressing the crude resin. It is grey and opaque, contains much water, and is identical with an impure but genuine Burgundy Pitch sometimes found in the London market.

4. *Gereinigtes Fichtenharz, Résine purifiée.*—This is No. 3 in a purified condition, or, as we should call it, *True Burgundy Pitch* in its purest condition.

In addition to these specimens, Mr. Müller also exhibits samples of resin prepared for the use of brewers, who, in Germany, employ resin (*Brauerpech*) for coating the inside of beer casks.

1867. Another exhibitor of genuine Burgundy Pitch is Mr. Theodor Müllner of Hinter Brühl, Post Mödling near Vienna, who shows *Fichtenharz*, or crude resin of the Spruce Fir and *Fichtenpech*, which is the same in a purified condition. The latter may be regarded as a type of good Burgundy Pitch.

These contributions to the Paris Exhibition show that the resin of the Spruce is collected for trade purposes in Finland and in Germany,—and in the first-named country upon a very considerable scale. It does not, however, appear that it is ever termed *Burgundy Pitch* in the places where it is produced.

Although genuine Burgundy Pitch (usually, it must be admitted, in a very impure state) has been always obtainable in the London market, it is rarely found genuine in the shops, —an artificial compound being very generally supplied in its place.

This artificial Burgundy Pitch is of most variable appearance. On examining eight samples of it, I find that in my notes I have described it as dull tawny, bright tawny yellow, bright yellow, brilliant orange yellow, or bright orange brown. Some samples have a dull wax-like fracture, others a more or less shining or conchoidal fracture. Some exhibit, when broken, numerous cells containing air and water; others are more compact. All are more or less opaque, but become transparent on the surface in the course of time by the loss of water. All the samples have a weak terebinthinous odour, not one possessing the fragrance of true Burgundy Pitch. All are free from bits of stick and such like impurities which are frequently found in the genuine drug.

I am not in the secret of the manufacture of this artificial Burgundy Pitch, for which indeed each maker must have his own formula. According to common report, however, it is formed by melting together common resin with palm oil or some other fat, water being stirred into the mixture to produce an opaque appearance. In examining the characters of genuine and spurious Burgundy Pitch, I have noted the following differences:

True Burgundy Pitch.	Artificial Burgundy Pitch.	1867.
Colour dull yellowish brown; fracture shining, conchoidal; translucent; some samples contain much water and are opaque and of a dull grey colour, and require straining to free them from impurities. Odour peculiarly aromatic.	Colour usually more brilliant than that of the true Burgundy Pitch. Odour weak and hardly aromatic.	
Not wholly soluble in alcohol of ·838, but leaves a small amount of fine white flocculent matter.	Still less completely soluble in alcohol of ·838.	
Placed in contact with double its weight of glacial acetic acid in a vial, is dissolved with the exception of a small amount of flocculent matter.	Similarly treated, forms a turbid mixture which soon separated into two layers, a thick oily liquid above and a bright solution below.	

The foregoing characters apply to most of the artificial Burgundy Pitch which I have examined, and may be useful, so far as they go, for distinguishing the genuine from the spurious. The odour of true Burgundy Pitch is in itself an excellent criterion which cannot be conveyed by description. Solubility in glacial acetic acid serves to reveal the presence of fatty matter which is a common, perhaps an essential ingredient in the artificial Burgundy Pitch made in this country.

From what has preceded may be deduced the following

Conclusions.

1. True Burgundy Pitch is the melted and strained resin of *Abies excelsa*, DC.
2. An artificial compound is usually sold in lieu of it both in this country and on the Continent.
3. True Burgundy Pitch is produced on a large scale in Finland, also of fine quality in Baden and in Austria.
4. True Burgundy Pitch differs palpably from the artificial, and may be easily distinguished from it.

ON OIL OF THYME, COMMONLY SOLD AS OIL OF ORIGANUM.

1850. THE vast number of plants included in the botanical order of Labiatæ, and the very close alliance of many, render it not surprising that the history of their essential oils should in a few instances be involved in a degree of confusion or doubt. Nor is this the less to be wondered at, when we reflect on the great similarity of many of these oils, our imperfect means of distinguishing them and of ascertaining their purity, the unavoidable alteration produced on some by extraction, to say nothing of differences arising from locality, or from want of care in conducting the process of distillation.

The essential oil which I propose to submit to notice at this time, is not one of importance to medicine; yet having had the opportunity of visiting the district where it is obtained, I have elicited a few facts regarding it which appear sufficiently interesting to be laid before the Pharmaceutical Society.

The volatile oil sold by Chemists as *Oleum origani* is often popularly, and almost always commercially, termed *Oil of Thyme*. Writers on Materia Medica generally mention the latter name as an *incorrect* appellation of the true *oleum origani vulgaris*, a statement the converse of which I believe to be far more usually the case.

Thymus vulgaris. During a visit to the South of France in the autumn of last year, I procured from the manufacturer a sample of an essential oil of thyme, as well as a specimen of the plant from which it is distilled. This oil, which was submitted to Dr. Pereira, proved to be identical with the *oleum origani* of English druggists; and the plant, which was kindly examined by Dr. Lindley and G. Bentham, has been ascertained to be *Thymus vulgaris*. The latter gentleman, in a note to me, states that the plant in question is "the true *Thymus vulgaris*, so abundant on the arid wastes of Lower Languedoc as to be much used with rosemary and lavender for fuel."

Thymus vulgaris, the common thyme of the gardens, is collected from the rocky hills in the department of Gard in

1850.

the South of France, and the entire plant is submitted to distillation with water. The oil, which is of a reddish-brown colour, is called *Huile rouge de Thym.* Redistillation renders it colourless, and it is then termed *Huile blanche de Thym.* The coloured oil, however, is that most commonly sold.

The trade of distilling oils of thyme, lavender, and rosemary, is chiefly in the hands of small manufacturers at Milhaud, Aujargues, Souvignargues, and other villages in the vicinity of Nismes. From the makers, the oils are purchased by the merchants in the neighbouring towns, and thence exported to distant parts.

True commercial Oil of Origanum unknown.

The question naturally arises,—Is all the *oleum origani* used in this country thus derived? I believe it to be so. I have not been able to discover that any is manufactured here, nor have I succeeded in procuring a sample so essentially differing from oil of thyme as to warrant my believing it to be genuine oil of origanum. The extremely low price at which oil of thyme can be produced in the South of France, and the common purposes to which it is applied, seem to preclude all attempt at competition in other localities. Cheap, however, as it is, it is yet occasionally the subject of adulteration with oil of turpentine, whose odour in such case may be readily detected, especially on comparison with a good sample.

Consumption.

That the consumption of oil of thyme in this country is considerable, may be gathered from the following extract from "*An Expository Statement of the Consumption of imported Commodities within the United Kingdom in two years preceding and two years following the establishment of the New Tariff. Presented to both Houses of Parliament by command of Her Majesty,* 1845."

OIL OF THYME.

Quantities retained for Home Consumption.			
Years ending 5th January.		Years ending 5th July.	
1839.	1841.	1843.	1844.
11,938 lb.	8,818 lb.	7,991 lb.	7,553 lb.

Although the duty under the new tariff was reduced from 1*s.* 4*d.* to 1*s.* per lb., the consumption declined. Whether it has continued to do so, it is not easy to ascertain, as no official return similar to that above quoted has since been published.

ON TRUE OIL OF ORIGANUM.

1851. In a recent number of the Pharmaceutical Transactions,[1] I endeavoured to prove that the article sold in this country as oil of origanum is, in reality, the oil of thyme (*Thymus vulgaris*), under which latter name it is imported from the South of France. I further stated, that so far as my observations extended, true oil of origanum was unknown in English commerce.

Authentic specimen. As it appeared desirable to have an authentic specimen of oil of origanum for comparison, a quantity of the oil was procured and distilled with water in the ordinary way. The plant, which was chiefly collected in the neighbourhood of Sheerness, was quite fresh, and very fully in flower when submitted to distillation. It afforded an exceedingly small amount of yellow oil, seventy pounds producing scarcely an ounce. This small produce may in part be attributed to the coolness and humidity of the weather for some time before the plant was collected, as it is evident from the following passage in Brande's *Dictionary of Materia Medica*, that a much larger amount of oil is usually obtained. This author states, "the average produce of essential oil from this herb [origanum] is one pound from two hundredweight; but it varies exceedingly with the season and culture of the plant."

Distinctive Characters. Contrasted with oil of thyme, oil of origanum is distinguished by the following characters:—

1 Odour, which is somewhat analogous to that of oil of peppermint, and entirely dissimilar from that of oil of thyme.

2. Colour, which in oil of origanum is bright yellow, while the ordinary kind of oil of thyme is of a more or less deep reddish-brown.

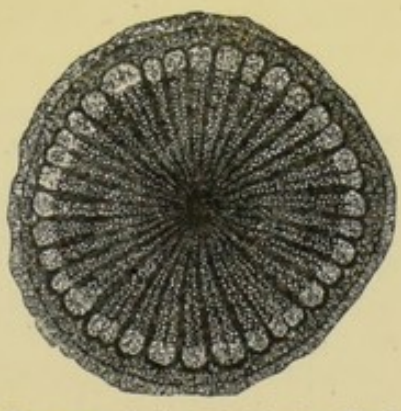
[1] *Vide* vol. x., p. 6.

The specific gravity of the two oils is so nearly alike, as to afford no distinctive criterion. That of oil of origanum is ·8854, of oil of thyme (average of three samples) ·8934, at 62° Fahr. 1851.

ON AN ARTICLE IMPORTED AS CALUMBA WOOD, SUPPOSED TO BE THE PRODUCE OF A *MENISPERMUM.*

(*Calumba-Holz aus Süd America.*)

Some months since there was imported into London from the island of Ceylon, under the name of *Calumba Wood,* a quantity of woody stems cut into lengths of from twelve to eighteen inches, and varying in diameter from one to four inches. The article was not wholly unknown to druggists, a small quantity having appeared in the market some years before. Calumba wood.



Transverse Section of Calumba Wood.
(Natural size.)
This cut has been prepared from an impression taken from the wood itself.

This wood, which is covered with a thin, pale, corky bark, is of a bright greenish-yellow colour, slightly bitter taste, and devoid of odour. A transverse section shows a small compact medulla, surrounded by very porous woody tissue, traversed by remarkably distinct medullary rays, each of which divides at its outer extremity into two layers, which diverge and form arches by uniting with the corresponding prolongations of the adjoining rays. Between some of the principal rays, smaller imperfect rays are occasionally observable. The heads of the arches are occupied by a loose, shrunken tissue, very different from the mature wood, with which, however, it is in immediate contact. There is no appearance of concentric zones.

This peculiarity of structure rendered it probable that the Calumba wood might be afforded by some plant of one of the three natural orders, *Piperaceæ, Aristolochiaceæ,* or *Menispermaceæ.*

1851. From the first of these it appears to be separated by the absence of a jointed structure, volatile acrid matter, and some other peculiarities characteristic of the pepper tribe, while from the diagnostic characters of the wood of the two remaining orders given by Decaisne (*Comptes Rendus*, vol. v., p. 392), an origin among the *Menispermaceæ* was inferred.

Upon the supposition that this inference was correct, reference was made to Roxburgh's *Flora Indica*, from which it appears (p. 809), as well as from the statement of Colebrooke (*Linnean Trans.*, vol. xiii., p. 65) and Ainslie (*Materia Indica*, vol. ii., p. 461) that the bitter yellow wood of the *Menispermum fenestratum*, Gærtn., is employed as a tonic by the natives of Ceylon; and that, moreover, this plant has been confounded by Europeans with the true Calumba, which has not been discovered in that island. It will, however, be best to give the statement of Roxburgh, which is as follows :—

Roxburgh. "*Menispermum fenestratum, Gært. Sem.* 1, p. 219, t. 46, f. 5. * * Trunk and large branches scandent, stout, thick and ligneous. The wood of a deep lively yellow colour, and of a pleasant, bitter taste. * * * The above description was taken from specimens sent to me from Ceylon by General Macdowall, who, at the same time, gave me the following account of the plant.

'I have lately been at some trouble to discover whether or not the true *Colombo root* is a native of our soil, and shall probably remain in doubt until I am furnished with your opinion. I now forward a specimen of the root, and some of the leaves and flowers which grow from the stem of the branch. It is a very strong creeper, and the natives make use of it to tie their cattle, and for other purposes of husbandry, where ropes are necessary.

'Should this prove the celebrated *Colombo root*, I believe a great quantity of it might be collected and sent to Europe, where it is in great request, but I can scarcely presume to think, after all the labour of the learned Thunberg in particular, who denies its existence here, that I shall be so fortunate as to discover it. Your opinion shall be decisive with me, and although it may not be that valuable medicine, I suppose it yet may possess many excellent qualities. It is called by the

Cingalese *Venivel-getta* or *Bangwel-getta;* English, the knotted plant. It is in repute among the inhabitants, who slice it into pieces, and after having steeped it in water several hours, swallow it with the liquid. They recommend it as an excellent stomachic. 1851.

'When the seed ripens, I shall have the pleasure of sending you some of it at all events.

'I have sent you a pretty large bit of the root, sawed from the centre of a knot, that you may make an experiment upon it."

"*Note.*—This is certainly not the *Colombo Root* of our *Materia Medica.*—*R.*"

The Cingalese name *Venivel-getta,* so nearly corresponds with that of *Weni-wæla-gœta,* applied by Moon (*Catalogue of Indigenous and Exotic Plants growing in Ceylon, Colombo,* 1821, p. 70) to a plant which he calls *Cissampelos convolvulacea,* var. *β,* whose root he states to be medicinal, that I have been led to suspect that Moon's plant may prove identical with the *Menispermum fenestratum* of Roxburgh.

It is, however, evident that we are without any *proof* that Calumba wood is produced by *M. fenestratum,* and although from the foregoing statement of Roxburgh it may appear probable that such is the case, yet, as many plants of this genus are employed medicinally in the countries of which they are natives, I think it must be concluded that there is at present by no means sufficient evidence to decide to which species it should be assigned.

Dr. Pereira (to whose valuable assistance on this and on many other occasions I am greatly indebted) has shown me a curious old tract, entitled, "*Some Observations made upon the Calumba Wood, otherwise called Calumback, imported from the Indies: showing its admirable virtues in curing the Gout, and easing all sorts of Rhumatical Pains. Written by a Doctor of Physick in the Countrey, to the President of the College of Physicians in London.*" London 1694. But as this author gives no description of the wood, it is not possible to say to what substance he refers, though it is likely that the Calambac, or Aloes Wood of the old pharmacologists, may have been intended.

1851. As the Calumba wood recently imported did not meet with a ready sale, a quantity of it was sawed into discs of about a sixth of an inch in thickness, and in this state offered as Calumba *root!* The appearance of these discs is so entirely different from that of genuine Calumba root, that there seems but little danger of their being purchased in mistake, at least in this country. The smoothness of the sawed surfaces, hardness, and peculiar ligneous structure, together with the absence of starch, are quite sufficient to distinguish this drug from the true Calumba root.

1853. ## ON THE *INSECT-WHITE-WAX* OF CHINA.

(*Weisses chinesisches Insectenwachs.*)

SYNONYMS.—蟲白蠟 Chung-pĭh-lă, *i.e. insect white-wax;* Pĭh-lă, Pe-la or Pé-la, *i.e. white-wax.* In English, the names *White wax of insects, Chinese wax, Chinese insect-wax, Japanese wax,*[1] *Tree wax, Chinese vegetable wax, Vegetable spermaceti,* have all been used to designate this substance.

The crude wax is called *Lă-tcha i.e.* wax-sediment; the so-called cocoons of the insect *La-chung* wax-seed, or *La-tsze* wax-son; the insects also are called *La-chung* (Julien).

HISTORY.—According to Siu-kouang-ki, the author of a well-known Chinese treatise on agriculture called Nong-tching-

[1] This name has been applied to a kind of wax supposed to be extracted from the seeds of *Rhus succedanea*, Linn., as related by Kæmpfer (*Amœn.* p. 794) and Thunberg (*Flor. Jap.* p. 122). See Martiny's *Encyklopädie der Medicinisch-pharmaceutischen Naturalien und Rohwaarenkunde*, Band i., p. 172. A sample has been kindly presented to me by Dr. Theodor Martius, and I have likewise met with it in the London market, eighty cases having been offered for sale as *Japan Beeswax*, by Messrs. T. Merry and Son, May 20, 1852. My specimens consist of a white wax, of somewhat rancid odour, in circular cakes of from 4 to 4½ inches in diameter, nearly one inch thick, flat on one side and rounded off on the other as if cast in a small saucer. They are sparingly covered with a white powder, and, in Mr. Merry's wax, present here and there traces of a sparkling crystalline efflorescence. The fusing points of the samples I find to be respectively 125·6° and 131° Fahr. Dr. Martiny gives it as + 45° C. = 113° Fahr.

tsiouen-chou,[1] it was not until the middle of the thirteenth century[2] that this remarkable production came into notice in China, previous to that date the wax of the bee alone having been employed. It appears, however, to have been by no means abundant at a period long posterior to this, as the Abbé Grosier speaks of it being reserved for the emperor and mandarins of high rank.[3] Du Halde, in his *Description Géographique, Historique, Chronologique de l'Empire de la Chine*, published in 1735,[4] gave an excellent account[5] of the production and cultivation of this insect wax, and it has subsequently been noticed with more or less accuracy by various other authors on China, all, however, appearing to borrow from the native writers. 1853.

The *Chung-pĭh-lă* of the Chinese has been confounded with other insect products, as with the secretion of *Coccus ceriferus*, Fabr., called *White Lac*, and with the substance formed by *Flata limbata*, *F. nigricornis*, and other allied insects of the family *Fulgoridæ*.[6] The difference between it and these substances I will endeavour to point out.

Dr. Pearson, who examined the white lac collected at Madras by Dr. James Anderson,[7] has recorded the following as some of the characters of that substance:—[8]

White lac is brittle and semi-transparent; when strained and purified, it has a greater specific gravity than water; it fuses at White lac.

[1] Quoted by M. Stanislas Julien in his *Nouveaux Renseignements sur la Cire d'Arbres et sur les Insectes qui la produisent.—Comptes Rendus*, 13 April, 1840, p. 618.

[2] Du Halde says not until the dynasty of Yuen, *i.e.* A.D. 1280.

[3] *General Description of China, translated from the French of the Abbé Grosier.* Lond. 1788, vol. i., p. 441. The Abbé, however, never visited China. His *Description Générale de la Chine* is an abridgment of the Memoirs of the Mission to Pekin by the Jesuits. See Dibdin's *Bibliographical, Antiquarian, and Picturesque Tour*, vol. ii., p. 321.

[4] At Paris, in four volumes, folio. [5] Tome iii., p. 495.

[6] See J. O. Westwood's *Introduction to the Modern Classification of Insects.* Lond., 1840, vol. ii., p. 429; also *Reports by the Juries—Exhibition of the Works of Industry of all Nations*, 1851. Lond. 1852, 8vo. p. 624.

[7] See *Correspondence for the Introduction of Cochineal Insects from America, the Varnish and Tallow Trees from China, the Discovery and Culture of White Lac, the Culture of Red Lac, &c.*, by James Anderson, M.D. Madras, 1791, 8vo.

[8] *Observations and Experiments on a wax-like substance resembling the Pé-la of the Chinese.—Phil. Transact.*, 1794, p. 383.

1853. 145° Fah.; is soluble in ether and in alcohol; it is imperfectly saponifiable with a fixed alkali. Pressed or rubbed until it be soft, it emits a peculiar odour. In the mouth it becomes soft and tough, and has a bitterish taste. These properties indicate it to be essentially distinct from the Chinese insect-white-wax. The description of the formation of white lac given by Dr. Anderson does not accord with the best accounts of the production of the Chinese wax.[1]

The wax-like substance afforded by *Flata limbata* is dropped as a sweet sticky liquid upon the leaves of the plant on which the insect feeds, so that they appear to be thinly bedewed with honey. "This," says Captain Hutton, "gradually accumulates, and, as it passes from a liquid to a solid state, appears like a thick coating of wax upon the leaves, but as it dries by exposure to the sun and atmosphere, it hardens into a snowy white brittle substance, giving the tree the appearance of being *white-washed*, or frosted over with white sugar, like the top of a Twelfth Night cake. It then cracks and falls in pieces to the ground, where it soon dissolves from rain and dews and is lost."[2] This secretion, Captain Hutton states, was found "to dissolve readily in water, and when boiled and allowed to cool, a deposit of clear white crystals was formed in the vessel." Neither this deposit nor the crude substance could be combined with heated oil; "while the attempt to melt it on the fire without water or oil, proved altogether abortive, the wax merely burning and consuming away till it became converted into a hard and baked substance. Melted in water, the mixture assumed a brownish hue with strong aromatic scent." Captain Hutton reasonably concludes that the Chinese wax is not the produce of *Flata limbata*.[3]

Captain Hutton.

[1] I have never met with Dr. Anderson's *Monographia Cocci ceriferi* (Madras, 1790), where the insect according to Virey (*Comptes Rendus*, April 20, 1840, p. 666) is described and figured.

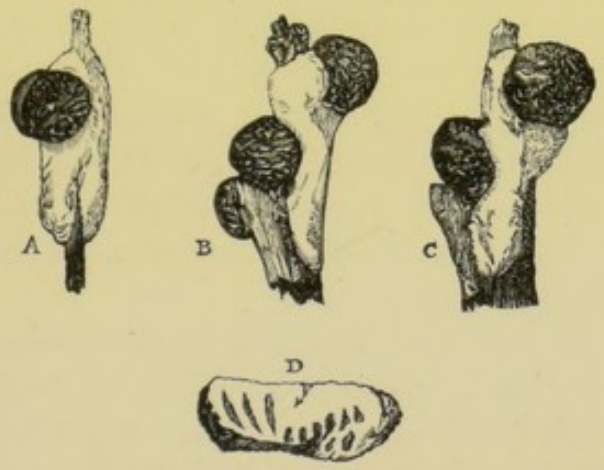
[2] *Note on the Flata limbata and the White Wax of China*, by Capt. Thomas Hutton, B.N.I., in the *Journal of the Asiatic Society of Bengal*. Calcutta, 1843, vol. xii., p. 898.

[3] The insect observed upon a privet near Turon in Cochin-China, and figured by Sir George Staunton in his *Account of Lord Macartney's Embassy to China* (Lond., 1797, 4to. vol. i. p. 353) is evidently an immature *Flata*.

1853.

PRODUCTION.—Until almost the present time the species of insect producing the Chinese wax has been a matter of great uncertainty. The foregoing accounts appear clearly to prove that it is not afforded either by the *Coccus ceriferus*, Fabr., of India, or by a *Flata*.

It is to the persevering endeavours of William Lockhart, Esq. of Shanghai, that we owe the discovery that the Chinese insect-wax is produced by a species of *Coccus* hitherto undescribed. Within the last three months this gentleman has transmitted to England a specimen of the crude wax as scraped from the tree, in which a number of the dried full-grown bodies of a female *Coccus* are to be found, as well as pieces of stick encrusted



COCCUS SINENSIS, Westwood.

A B C. Mature female insects adhering to pieces of stick partially encrusted with the wax (*natural size*).

D. Vertical section of a piece of the crude wax, showing the position of the young insects (*magnified*).

with the wax, and with the insects still *in situ*. Mr J. O. Westwood, who has examined the specimen, has reported upon it to the Entomological Society, Feb. 7, 1853,[1] proposing at the same time the name of *Coccus Sinensis* for the new insect. The imperfect condition of the specimens and the want of the male insect preclude the possibility of a complete scientific description being drawn up; the existing remains consist of a dry, hollow, nearly spherical mass, frequently somewhat shrivelled, externally shining, and of a deep reddish-brown colour. This

Coccus Sinensis.

[1] *Athenæum*, Feb. 19, 1853, p. 229; also *Zoologist* for March 1853, p. 3820.

1853. mass or shell, which is the full grown body of the female insect, varies in diameter from $\frac{3}{10}$ to $\frac{4}{10}$ of an inch. It has a linear opening on one side indicating the part at which it was attached to the branch, and is besides frequently perforated with one or more small holes. As the wood-cut shows, it occurs as it were, seated in the wax encrusting the branch, like a minute gall or small round sessile berry. Besides these large females, the wax contains imbedded in its under surface an abundance of minute insects in a younger state, which are probably the real producers of the wax. In form they are not unlike little oval wood-lice (*Onisci*). The crude wax itself forms around the branch a white, soft fibrous, velvety coating of from one to two-tenths of an inch in thickness. When scraped off, as in a specimen which I have examined, it occurs in light, flat, curled or rounded, irregular pieces, the larger of which are about half an inch in greatest length. Having observed that its microscopic characters presented features of interest, I sent a specimen to Mr. Quekett, the result of whose investigations were afterwards published.

So far as I can ascertain, no European has yet had the opportunity of examining the living wax insect in its native localities ; I therefore insert the following account of its culture, as taken chiefly from Chinese authors,[1] at the same time making no attempt to reconcile it with the well known habits of other species of *Coccus*.[2]

[1] Quoted by Du Halde in his *Description de la Chine*, éd. 1735, tome iii., p. 495 ; by M. Stanislas Julien in the *Comptes Rendus*, 13 April, 1840 (pp. 518—625) ; also by Dr. D. J. Macgowan, in a paper *On the Uses of the* Stillingia sebifera *or Tallow Tree, with a notice of the* Pé-la *or insect-wax of China*, contained in the *Journal of the Agricultural and Horticultural Society of India*. Calcutta, 1850, vol. vii., part i. p. 164. Through the kind assistance of Mrs. Lockhart, I have been enabled to compare with these one of the accounts in the original Chinese contained in the herbal called *Pun-tsaou-kang-mŭh*.

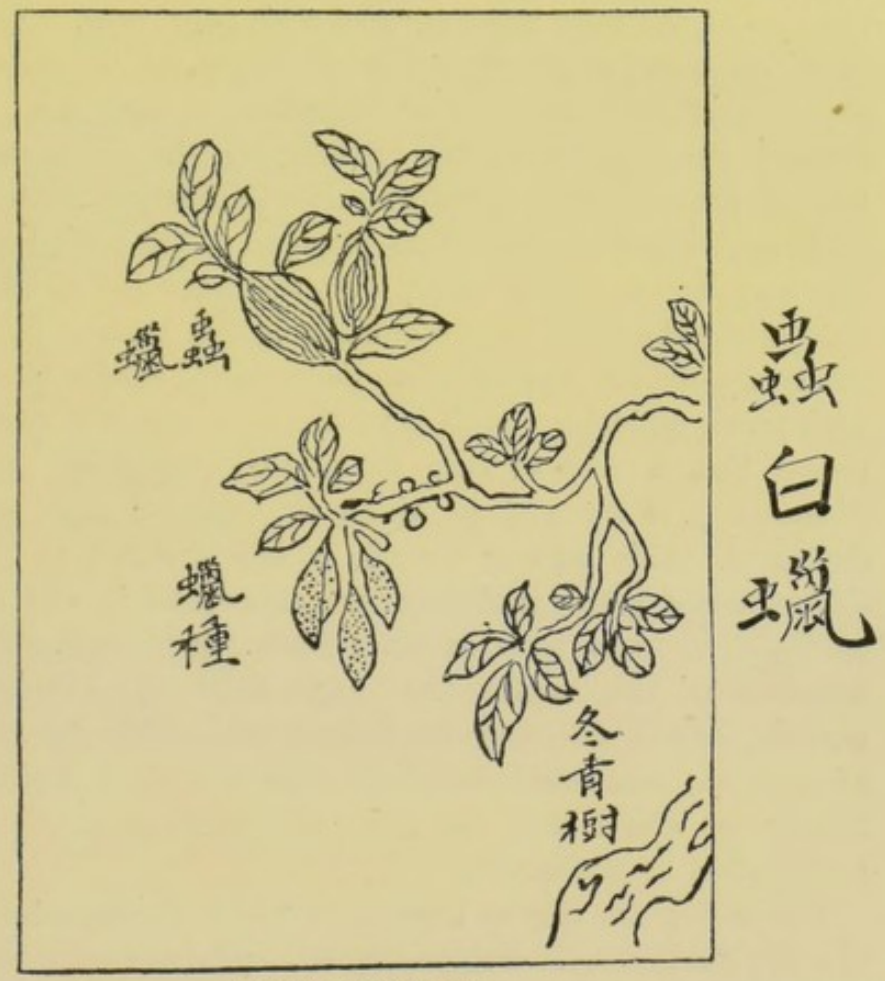
[2] It may be interesting to those unacquainted with the habits of *Coccus* to read the following lines respecting a well-known species, *C. Kermes:*

"In their youth, the females resemble little white *wood-lice*, which would have but six feet. They run upon the leaves, and afterwards fix upon the stems and branches of trees and shrubs, where they pass many months in succession. It is then that they assume the figure of a gall or excrescence." —Cuvier's *Animal Kingdom*. London, 1832, vol. xv., p. 286.

1853.

In the spring the cocoons containing the eggs of the insect are folded up by the cultivators in leaves (sometimes of the ginger plant) and suspended at various distances on the branches of the tree which is to be stocked. After having been thus exposed for from one to four weeks, the eggs are hatched and the

Cultivation.



Wax-Tree and Insect.

Fac-simile of a drawing made from the Pun-tsaou-kang-mŭh The upper characters on the left are *Chung-là* (insect-wax); beneath them, *Là-chung* (wax-seed); in the right-hand corner at bottom, *Tung-tsing-shoo* (winter-green-tree). The larger characters on the right are *Chung-pih-là* (insect-white-wax).

insects, which are white and of the size of millet seeds, emerge and attach themselves to the branches of the tree or conceal themselves beneath its leaves. Some authors state that the insects have at this period a tendency to descend the tree, at the base of which, should there be any grass there, they would remain, and that, to obviate this difficulty, the Chinese keep the ground perfectly bare, so that they are induced to ascend.

1853.

Collection of Insect Wax.

According to the author of the Pun-tsaou-kang-mŭh the ground under the trees must be kept very clean in order to guard against ants devouring the insects. Fixing themselves on the branches the young insects speedily commence the formation of a white waxy secretion, which becoming harder suggests the idea of the trees being covered with hoar frost. The insect itself becomes [*gradually imbedded?* or] as the Chinese authors say *changed into wax.* The branches of the tree are now scraped, the collected matter constituting the crude wax. The time of the collection probably varies in different districts, some authors giving June and others August, as the period at which the wax harvest takes place. At the latter period (August or September) the waxy matter containing the insects becomes so firmly attached to the tree that its removal would be attended with much difficulty, and it is in the wax thus left and at this period that a sort of case or cocoon ("purplish envelope," *Macgowan*) is formed,[1] in which the eggs of the insect are deposited. This nest or cocoon, which is stated to be of the size of a rice grain, gradually increases until in the following spring it becomes as large as a *hen's egg* (!), suggesting when attached to the branch the appearance of a fruit.[2] The cocoons, called *Lă-chung* or *Lă-tsze,* which inclose multitudes of eggs, are removed, sometimes together with a piece of the branch on which they are fixed, and reserved for the further propagation of the insect.

Food.

Respecting the tree or trees upon which the wax-insect feeds (for like the *Coccus lacca* there may be several trees that support it), it is evident that our information is as yet extremely defective. Mr. Fortune entertains great doubts whether the insect really feeds as reputed on any species of *Rhus, Ligustrum,* or *Hibiscus.*

[1] Probably the inflated body of the mature female insect is here referred to.

[2] In the Pun-tsaou-kang-mŭh the expression used signifies *fowl's-head.* Now it is quite certain that the bodies of the female *Cocci* received in Mr. Lockhart's specimen had attained their full development. What, then, can the Chinese author mean by this monstrous aftergrowth? Can he have confused with it the packets of eggs suspended to the tree for the propagation of the insect?

1853.

Fortune's Wax-plant.

When in China, he obtained from the province of Sze-tchuen, through some Catholic Missionaries, a living plant which he was assured was that on which the wax-insect is found.[1] This plant, which is now in England, is a deciduous woody-stemmed shrub of about 1½ feet high. A very scanty specimen of it which I possess has imparipinnate, glabrous leaves; lateral leaflets 1½ to 1¾ inches long, including the petiolules, which are about two lines long, elliptical, very oblique at the base, inequilateral, rather strongly serrated, penniveined and distinctly reticulated on both sides over the surface; terminal leaflet thrice as large as the rest, nearly ovate, very unequal at the base, and with a petiolule nearly an inch long. As it has not yet flowered, neither the genus nor even the natural order can with certainty be determined; but judging from its leaves, the plant has much similarity, as suggested by Mr. Fortune, to some species of ash (*Fraxinus*). According to M. Julien, the plants upon which the wax-insect is reputed to feed are four in number:

Species of *Fraxinus*.

M. Julien.

1. Niu-tching.—This tree, according to M. Adolphe Brongniart as quoted by M. Julien,[2] is *Rhus succedanea*, Linn. Other names are applied in China to the Niu-tching (literally *pure-virgin*), as Tching-mou (*pure-tree*), La-chou (wax-tree). It is also called *Tung-tsing* in common with the following.

2. Tung-tsing.—This name Mr. Fortune has informed me is applied to *Ligustrum lucidum*, Aiton.[3] Dr. Macgowan mentions *L. lucidum* as the tree on which the wax-insect is reputed to feed. Rémusat identifies it (under the name of *Toung-thsing*)

[1] See *Gardener's Chronicle and Agricultural Gazette*, Aug. 21, 1852.
A solitary leaflet found in Mr. Lockhart's specimen of wax so obviously corresponds with those of Mr. Fortune's plants, that I see little reason to doubt the fact of its being *one* of those which support the *Coccus sinensis*.

[2] Julien in *Comptes Rendus*, April 13, 1840, p. 619.

[3] Mr. Fortune adds, however, that although he has seen the tree in great abundance in districts of Chekiang and Kiangnan, he has never observed the wax-insect upon it. Indeed, I am myself of opinion that the statement that the wax-insect feeds upon *Ligustrum lucidum* is altogether erroneous; for although this tree is certainly called *Tung-tsing*, yet Du Halde's assertion is that the wax-tree has branches and leaves *resembling* those of the Tung-tsing, while the fruits of the two trees are *different*.

1853. as *Ligustrum glabrum*, but cites no authority.[1] De Candolle has alluded to *L. glabrum* as var. β of *L. Nepalense*, Wall. (*Prodrom.* viii. p. 294), and Thunberg has a *L. glabrum* among the *Plantæ obscuræ* of his *Flora Japonica*.[2]

Tung-tsing, variously spelt *Tong-çin*, *Toung-thsing*, &c., is also called *Choui-toug-tsing* (water-winter-green); it is probably the *Choui-la-chu* (aquatic-wax-tree) of Grosier.

Ligustrum lucidum.

Much attention, says Dr. Macgowan, quoting a Chinese author, and assuming *Ligustrum lucidum* to be the wax-tree, is paid to the cultivation of this plant: extensive districts of country are covered with it, and it forms an important branch of agricultural industry. The trees, which are propagated either by seeds or cuttings, are planted in rows and pruned periodically, while the ground is well manured and kept free from weeds.

Hibiscus Syriacus.

3. Chöui-kin (the *Kin* of moist places), Niu-la-chou (female wax-tree), is thought by M. Julien to be allied to the *Mou-Kin* (arborescent *Kin*) identified by Rémusat as *Hibiscus Syriacus*.

4. Tcha-la ("*appliquer-cire*") Julien, is cultivated chiefly in the country of Chou, a dependency of the province of Sze-tchuen. Like the preceding, its botanical name is unknown.

Localities.—Insect-white-wax is collected in the provinces of Sze-tchuen, Hou-kouang, Yun-nan and Fo-kien (Julien), also in Che-kiang and Kiang-nan (Du Halde). Du Halde says that that collected in the provinces of Sze-tchuen and Yun-nan, and in the territories of Hen-tcheou and Yung-tcheou is of superior quality.

Now Sir B. C. Brodie.

Chemical Properties and Composition.—The chemical properties and composition of Chinese insect-wax have been elaborately and ably investigated by Mr. B. C. Brodie.[3] According to this chemist, the Chinese wax as it occurs in commerce is a

[1] *Notices et Extraits des Manuscrits de la Bibliothèque du Roi, &c.*, Paris, 1827, vol. xi., p. 274.

[2] Page 354, No. xxv.

[3] *On the Chemical Nature of a Wax from China*, by Benjamin Collins Brodie, Esq., in the *Philosophical Transactions* for 1848, p. 159.

substance nearly in a state of chemical purity. By alcohol small portions of a greasy matter may be separated from it, and on distillation it affords traces of acrolein, which is not a product of the pure wax. The impurities, however, are unimportant. 1853.

The melting point of the commercial wax is 181·4° Fahr.;[1] that of the perfectly pure wax, 179·6°. Chinese wax is very slightly soluble in alcohol or ether, but dissolves with great facility in naphtha, out of which fluid it may be crystallized. The mean of M. Brodie's analyses of the purified wax gave its composition thus— Melting point.

Carbon	82·235
Hydrogen	13·575
Oxygen	4·190
	10·0000

which numbers agree with the formula $C_{108}\ H_{108}\ O_4$.[2] Although the wax is scarcely saponified by being boiled in a solution of caustic potash, it may readily be decomposed by fusion with the solid alkali becoming, as Mr. Maskelyne has observed, broken up into substances with the formula $C_{54}\ H_{56}\ O_2$ [cerotin] $+ C_{54}\ H_{54}\ O_4$ [cerotic acid], two equivalents of water being assumed in the saponification. Mr. Maskelyne, in some experiments performed subsequently to those of Mr. Brodie, has shown that by the action of lime and potash the cerotin may be oxidized, and the whole converted into cerotic acid.[3] Chemical properties.

I would however refer the reader to the original papers of these gentlemen for a copious and interesting account of the chemistry of the wax.

[1] I can confirm this statement so far as regards three specimens in my possession; a fourth I find to fuse at 180° Fahr., while some prepared by myself from the crude wax sent by Mr. Lockhart fuses at 182·75° Fahr. Dr. Ure states its melting point to be 196° (*Pharm. Journ.*, vol. vi., p. 69). Dr. Macgowan gives it as 100° Fahr., but this latter must surely be a misprint.

[2] *Op. cit.*, p. 170.

[3] *On the Oxidation of Chinese Wax*, by Nevil S. Maskelyne, M.A., in the *Quarterly Journal of the Chemical Society*, vol. v., p. 24 (April 1852).

1853.

Commerce.—Dr. Macgowan estimates the annual produce of Chinese wax as not far short of 400,000 pounds, valued at upwards of 100,000 Spanish dollars. At Ningpo he says the wax costs from 22 to 35 cents (1*s.* to 1*s.* 6*d.*) per pound.[1]

The only considerable importations of Chinese wax into England that I am aware of, were in the years 1846 and 1847, when nearly three tons were imported into London. Some of this wax sold in April, 1847, fetched 1*s.* 3*d.* per pound, a price too low, I believe, to be remunerative, and no further importation that I know of has since taken place.

The insect-wax occurs in commerce in circular cakes of various dimensions: some of those imported into London had a diameter of about 13 inches, a thickness of about $3\frac{1}{2}$ inches, and were perforated near the centre with a hole $\frac{5}{8}$ths of an inch across. The broken surface generally exhibits the wax as a beautifully sparkling, highly crystalline substance somewhat resembling spermaceti but much harder; some cakes are internally much less crystalline and sparkling than others. The wax is colourless and inodorous or nearly so, tasteless, brittle and readily pulverizable at the temperature of 60° Fahr.

Uses.—In China, candles are made of the insect-wax *per se*, but more commonly of a mixture of it with some softer fatty substance. To give to these softer candles a hard coating and to prevent their guttering, they are dipped into melted insect-wax often coloured red with alkanet root,—sometimes green with verdigris.

Mr. Lockhart tells me that the edges of books and the edges of the soles of shoes are rubbed with the wax in order to give them a bright face; and that it is also rubbed on the brush with which red earthenware is polished.[2]

[1] *Journal of the Agricultural and Horticultural Society of India*, vol. vii., part i. p. 164.

[2] I will here acknowledge the kindness with which my friend Mr. Lockhart has ably assisted my investigation respecting the substance under notice. My thanks are also due to Mr. G. F. Wilson, of Vauxhall, for some valuable information about its commercial history; to Mr. Hugh Barclay, of Regent Street, for aiding my inquiries and for a fine specimen of the wax; and to Sir W. J. Hooker and Mr. Kippist for their assistance in endeavouring to identify Mr. Fortune's wax tree.

1853.

The use of the wax in the candle manufacture in this country has been made the subject of a patent granted in 1845 to Mr. Samuel Childs. He advises its mixture with stearic acid in the proportion of one part to twenty, and speaks also of employing it in the manufacture of "*Composite*," bees'-wax and spermaceti candles. When combined with stearine it has been found serviceable in what is technically called *breaking the grain* (*i.e.*, diminishing the crystalline texture) of the stearine previously to its being formed into candles.

Medical uses.

As a medicine, the insect-wax is used by the Chinese both externally and internally for a variety of ailments. Du Halde says "it makes flesh grow, stops bleeding, eases pain, restores strength, braces the nerves, and joins broken bones together."[1] Grosier, besides mentioning its employment as an application to wounds, states that it is sometimes swallowed to the extent of an ounce at a time as a stimulant (!) by those about to speak in public.[2]

NOTICE OF A SPECIMEN OF INSECT-WAX FROM CHINA.

1856.

(*Read before the Linnean Society, April 15th*, 1856.)

[Abstract.]

Specimen.

Mr. D. Hanbury exhibited a specimen of Chinese Insect-wax in the crude state, attached to the branch on which it had been formed by the insect, *Coccus Pe-la*, Westw.[3] (*C. sinensis*, Westw., *Pharm. Journ.* xii. 478).

Locality.

The specimen was obtained by Dr. M'Cartee, of Ningpo, at a spot about fourteen miles N.E. of that city. The exact locality is described as "three miles from Chin-hae, southerly, behind the first range of hills across the river, — in the direction of Ling-fung," where the trees supporting the wax-insect occur on the banks of the canals.

[1] *Description of the Empire of China, translated from the French of P. J. B. Du Halde.* Lond. 1741, vol. ii., p. 230.
[2] *General Description of China*, 1788, vol. i., p. 442.
[3] *Gardener's Chronicle*, for Aug. 20, 1853, p. 532.

1856.

Dr. M'Cartee procured specimens for Mr. Fortune, which that gentleman has taken to India with the view of introducing the insect into that country. He also sent specimens to William Lockhart, Esq., of Shanghai, through whose kindness that exhibited was received.

It may be remarked that, according to the Chinese accounts, the trees upon which the wax-insect lives are of two or three species. Of one of these, resembling an ash, a dried specimen was on the table. Mr. Lockhart has in his garden at Shanghai a small wax-tree of this species which he hopes shortly to colonize with the wax-insect. The tree has not yet flowered, and its botanical position is as yet undetermined. A living plant of the same species was brought to England by Mr. Fortune, from whose hands it passed into those of Messrs. Rollisson and Sons, of Tooting.

Wax-tree.

Specimens of the manufactured insect-wax from China were also on the table.

NOTE ON INSECTS PRODUCING WAX FROM PORT NATAL AND CHINA.

By J. O. Westwood, Esq., F.L.S., &c.

(*Read at the same meeting, April 15th*, 1856.)

Natal Wax-insect.

The wax-insect from Natal, exhibited by Mr. W. W. Saunders, is the female of a large species of *Coccus*, analogous to the *Coccus ceriferus;* each female being about the size of a pea, and of a dark chestnut colour, but encased in a solid layer of white waxy matter nearly a quarter of an inch thick, so as to make the entire insect as large as a boy's marble; the under side being flattened, or rather concave, so as to fit the convex surface of the branch on which they are found. The size of the insect would render it easy of observation, and the thickness of the wax would make it a more important object of commerce than the wax-insects of South America.

Chinese Wax-insect.

The Chinese wax-insect, of which so fine a specimen on the branch has been exhibited by Mr. Daniel Hanbury, differs from

the latter by the waxy matter being deposited over the surface of the branch, and not confined to a coating of the insect. The specimens submitted to my examination are probably of considerable age, as they have been much deteriorated in a commercial point of view, by being attacked by other insects, namely a species of ant, of which I found the heads and other parts of several specimens; and a species of moth, of which I found portions of many chrysalides; the larvæ of which, I do not doubt, had devoured the animal matter of the *Cocci*, as well as burrowed into the wax. There were also some fragments of a *Curculio* (*Otiorhynchus?*), but these, I suppose, must have been taken accidentally on the trees in collecting the *Cocci*. 1856.

ON *WURRUS*, A DYE PRODUCED BY *ROTTLERA TINCTORIA*.

(*Wurrus-Farbstoff, von Rottlera tinctoria.*)

AMONG the drugs forwarded to England by James Vaughan, Esq., late port-surgeon at Aden, and described in recent numbers of the *Pharmaceutical Journal*, was a substance sent under the name of *Wurrus* or *Waras*.[1] It consists of a brick-red, granular powder with but little taste and smell. Examined under the microscope it is seen to be composed of small, roundish, translucent grains of a ruby red colour, much resembling (except in colour) the grains of lupuline. 1853.

Upon showing some of the *Wurrus* to Mr. Alexander Gibson, of Bombay, when he was in London, he immediately suggested that it was the red powder rubbed from the capsules of *Rottlera tinctoria*, Roxb.; and upon a subsequent comparison of it with specimens in the herbarium of the Linnean Society, I soon convinced myself of the correctness of his opinion. Mr. Gibson informed me that the tree is abundant in the Bombay Presidency, where it attains a height of from twelve to fifteen feet; and that it is frequently observed in the vicinity of streams and on the edge of the jungle. *Rottlera tinctoria.*

[1] See *Pharm. Journ.*, vol. xii., p. 386.

1853.

Dr. Roxburgh, in his *Plants of the Coast of Coromandel,* has published a beautiful figure of *Rottlera tinctoria,* accompanied by the following description of the fruit (vol. ii., p. 36, fig. 168): "*Capsule* roundish, three-furrowed, three-celled, three-valved, size of a small cherry, covered with much red powder. *Seed* solitary, globular." After stating that the tree is a native of the inland mountainous parts of the Circars, flowering during the cold season, he thus proceeds:—

Dr. Roxburgh.

"The red powder which covers the capsules is a noted dyeing drug, especially among the Moors, and constitutes a considerable branch of commerce from the mountainous parts of the Circars. It is chiefly purchased by the merchants trading to Hydrabad and other interior parts of the peninsula. When the capsules are ripe or full-grown, in February and March, they are gathered, the red powder is carefully brushed off and collected for sale, no sort of preparation being necessary to preserve it. . . . . .

"This red powder dyes silk a deep, bright, durable, orange or flame-colour of very great beauty. The Hindoo silk dyers use the following method:—

"Four parts of Wassunta-gunda [the Telinga name of *Rottlera tinctoria*], one of powdered alum, two of salt of soda (native Barilla) which is sold in the bazaars, are rubbed well together with a very small proportion of oil of sesamum, so little as hardly to be perceptible; when well mixed, the whole is put into boiling water, proportionable to the silk to be dyed, and kept boiling smartly more or less time, according to the shade required, but turning the silk frequently to render the colour uniform."

Dr. F. Buchanan.

Dr. Francis Buchanan met with *Rottlera tinctoria* in the Animalaya forest in Coimbatore, near the frontier of Malabar.[1] He states that the tree is called in the Tamil language *Corunga Munji Maram,* which signifies *Monkey's-face-tree,* "for these animals," says he, "paint their faces red, by rubbing them with the fruit. The tree is small and the timber bad. The natives deny all knowledge of the dyeing quality possessed by the red powder that covers the fruit; but at different places in Mysore,

[1] *A Journey from Madras through the Countries of Mysore, Canara, and Malabar.* Lond., 1807. 4to. Vol. ii., p. 339.

I was told that the dye was imported from this part of the country."[1] 1853.

Dr. Buchanan, speaking of the articles of trade at Bangalore,[2] states that most of the *Capili-podi* dye, or powder obtained from the fruit of *Rottlera tinctoria*, is brought there from Chin'-ráya-pattana, but that a little is also procured from Ráma-giri; both places are in Mysore.

Dr. Whitelaw Ainslie, in his *Materia Medica of Hindostan* (Madras, 1813, in 4to), page 146, has likewise noticed the "*Capilapodie*" dye afforded by *Rottlera tinctoria*.

ON *ROTTLERA TINCTORIA*, ROXB., AND ITS MEDICINAL PROPERTIES.

THE peculiar red powder which is obtained from the capsules of *Rottlera tinctoria*, Roxb., a tree of the Natural Order *Euphorbiaceæ*, has long been used in India on account of its valuable properties as a dye for silk. 1858.

Its application as a remedial agent having recently attracted attention in this country, in consequence of the favourable reports made by several practitioners in India, who have found it eminently successful in the treatment of *tænia*, I think it may be not uninteresting if I briefly recapitulate its history, and quote some of the statements that have appeared regarding its medicinal properties and mode of administration. Successful in *tænia*.

The genus *Rottlera*, so named in honour of the Rev. Dr. Rottler, an eminent Danish missionary and naturalist, was, as at present restricted, founded by Roxburgh in 1798. Rev. Dr. Rottler.

Rottlera tinctoria, Roxb., is a tree of from 15 to 20 feet in height; it is common in the hilly districts of India from Burma to the Punjab, and from Ceylon to the hot valleys of the whole of the Himalaya, where it ascends to an elevation of 5,000 feet; it is found in the Philippine Islands, in China, and in North-Eastern Australia; it appears also to occur in the South of Arabia and in the Somali country, from which regions the dye obtained from it is carried to Aden for sale.

[1] *A Journey from Madras through the Countries of Mysore, Canara, and Maiabar.* Lond., 1807. 4to. Vol. ii., p. 343. [2] *Ibid.* vol. i., p. 204.

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Fruit of *Rottlera*.

The fruit of the tree is tricoccous and of the size of a pea, covered on the outer surface with minute, sessile, roundish, semi-transparent glands of a bright red colour. According to Roxburgh the fruit ripens in February and March, at which period it is gathered, and the red, glandular powder is carefully brushed off and preserved for use.

Before further describing this substance, I may properly advert to the names by which it and the tree affording it are known to the natives of India; for some information on which part of the subject I am indebted to the kindness of Professor H. H. Wilson, of Oxford.

Indian names.

The Sanskrit name of *Rottlera tinctoria* is पुन्नाग *Punnaga*, a word having several synonyms, among which are तुंग *Tunga* and केसोर *Kesora*;—hence in Bengali we have *Punnág*, *Kesor* and *Tung*, and in Hindustani *Punnág*.

The red powder from the capsules is called in Bengali कामला *Kámalá*, abbreviated to *Kámal*. The Sanskrit word कपिल *Kapila*, signifying *tawny* or *dusky red*, would appear to be also applied to it. In the Tamil language the substance in question is termed *Kapilapodi*, a name compounded of the Sanskrit *Kapila* and the Tamil பொடி *Podi*, the latter word meaning the *pollen of a flower*, or *dust in general*.

Vasantagandha, a Sanskrit word meaning *spring-fragrance*, is, according to Roxburgh, a designation in the Telinga or Telugu language of the same red powder. In the bazaar at Aden, it is known as an article of trade under the name of ورس *Waras*, a word properly signifying *saffron*. It is probable, however, that this term has been given by the Indian Mohammedans, and is not used as a designation of the powder elsewhere.

The Hindustani name *Kámalá* has, with slight variations in spelling, been adopted by the Europeans in India, and I shall therefore employ it (omitting the accents indicating the long quantity of the vowels) as the most convenient term by which to designate the red powder derived from the capsules of *Rottlera tinctoria*.

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Kamala.

Kamala, as found in the Indian bazaars, has the aspect of a brick-red powder, possessing from its structure that peculiar mobile character which we notice in Lycopodium and Lupuline. It also agrees with Lycopodium in the difficulty with which it is mixed with water, and in the manner in which it ignites when thrown into the air over the flame of a candle. Examined with a lens, or still better with the compound microscope, it is seen to consist of garnet-red, semi-transparent, roundish granules, of from $\frac{1}{300}$ to $\frac{1}{250}$ of an inch in diameter, more or less mixed with minute stellate hairs and the remains of stalks and leaves: the latter substances however are easily removed by careful sifting, the drug thereby acquiring a brighter red colour and more uniform appearance.

Chemistry of Kamala.

Kamala has but little smell or taste. It is insoluble in cold water, and nearly so in boiling water. It is soluble in a solution of an alkaline carbonate, and still more so in one of caustic alkali, a deep-red solution being in either case produced. The addition of an acid to these solutions occasions a precipitate of resinous matter.

Treated with alcohol or ether, Kamala affords a large proportion of soluble matter and a solution of a beautiful deep-red colour. The alcoholic solution upon the addition of water becomes turbid from the precipitation of resin. By repeated digestions in hot alcohol, the whole of the resinous colouring matter of Kamala may be removed, a pale-whitish substance being the only residuum.

Rottlerine.

Dr. Thomas Anderson, Regius Professor of Chemistry in the University of Glasgow, who has made Kamala the subject of special investigation,[1] finds that if a concentrated ethereal solution of Kamala be allowed to stand for a couple of days, it solidifies into a mass of granular crystals. If these be drained, pressed in bibulous paper, and purified from adhering resin by repeated solution and crystallization in ether, the crystalline substance is obtained in a state of purity. It then consists of yellow crystals having the form of minute plates and a fine

[1] "*On the Colouring Matter of Rottlera tinctoria*," *Edinburgh New Philosophical Journal*, Jan.—April, 1855, p. 296.

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satiny lustre. This substance has been named by Dr. Anderson *Rottlerine.*

Characters of Rottlerine.

Dr. Anderson states that Rottlerine is insoluble in water, sparingly soluble in cold alcohol, more so in boiling. In ether, it is readily soluble. It dissolves in an alkaline solution with a dark-red colour. Its alcoholic solution is not precipitated by acetate of lead.

Bromine instantly decolorizes it, with formation of a substitution-product, which dissolves readily in spirit, and is thrown down by the addition of water. This compound does not crystallize, and could not be obtained in a state of purity. Nitric acid oxidizes Rottlerine, forming at first a yellow resinous matter, and by longer continued action a quantity of oxalic acid. Concentrated sulphuric acid in the cold dissolves it with a yellow colour, which, on the application of a gentle heat, becomes first red, and finally very dark, sulphurous acid being evolved. Heated on platinum it fuses into a yellow fluid, which decomposes at a higher temperature, giving off pungent fumes and leaving a bulky charcoal.

Analyses of Rottlerine.

The mean result of four analyses gave the composition of Rottlerine as—

		Calculation.		
Carbon . . .	69·112	69·47	C_{22}	132
Hydrogen . .	5·550	5·26	H_{10}	10
Oxygen . . .	25.333	25·27	O_6	48
	99·995	100·00		190

The attempts made to confirm this formula have not led to any definite result, Rottlerine forming no compound with the metallic oxides, and that with bromine not having been obtained sufficiently definite.

A concentrated alcoholic solution of Kamala deposits upon cooling a pale flocculent matter, sometimes in such abundance as completely to fill the fluid. This substance is soluble in boiling alcohol, but sparingly in cold; hardly soluble in ether, and insoluble in water. It appears to have no crystalline

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structure. It gives no precipitate with the salts of lead or silver, and does not appear to form a compound with any other substance. In drying it shrinks much, resembling hydrate of alumina coloured with oxide of iron. The quantity obtained was, however, too minute for a full investigation of its properties.

Analysis of Kamala.

From Professor Anderson's experiments, the composition of Kamala may be thus stated :—

Resinous colouring matters (including Rottlerine) .	78·19
Albuminous matters	7·34
Cellulose, &c.	7·14
Water	3·49
Ash	3·84
Volatile oil	trace
Volatile colouring matter	?
	100·00

Kamala is used throughout India as a dye for silk, its colour being extracted by boiling it in a solution of carbonate of soda. I have a specimen of silk dyed with it, which is of a rich orange-brown. The root of the tree is said to be also used in dyeing. In Indian medicine, Kamala is considered as "of a warm nature," and is given as an anthelmintic in very small doses.[1] It has also some repute as an application in certain cutaneous complaints. Among the Arabs of Aden, it is administered internally in leprosy, and is used in solution to remove freckles and pustules.[2] Dr. William Moore, of Dublin,[3] Physician to the Institution for the Diseases of Children of that city, has made some trials of it in *Herpes circinatus,* by rubbing the powder over the eruption with a piece of moistened lint. Dr. Moore states that two or three applications, accompanied with the internal administration of alterative doses of rhubarb and grey powder, sufficed for the removal of the disease.

Uses.

[1] Irvine, *Materia Medica of Patna*, Calcutta, 1848, p. 48.
[2] Vaughan in *Pharm. Journ. and Trans.* Vol. xii. p. 386.
[3] *On the Value of the Rottlera tinctoria* (Kameela) *as a Local Application to Herpes Circinatus*, by Wm. Moore, M.B., &c. *Dublin Hospital Gazette*, Nov. 15, 1857, p. 345.

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It is, however, in its character of an anthelmintic that Kamala appears most to deserve the attention of the medical man and pharmacist.

Referring to the reports that have been published, we find that the anthelmintic powers of Kamala have been investigated in India by Drs. Mackinnon, Anderson, Corbyn, and Gordon.

Trials of the drug in this country have as yet been very few. Dr. Arthur Leared, who has been one of the first to prescribe it in London, has recorded one successful case,[1] since which he informs me he has had four others also successful.

Dr. C. Mackinnon,[2] Superintending Surgeon, Bengal Medical Establishment, in introducing to notice the new remedy, states:—

Anthelmintic properties of Kamala.

"My attention was first called to it by a gunner of the brigade, affected with tapeworm, in whom both turpentine and kousso had failed to expel the worm. He stated that a companion of his affected with tapeworm had taken the remedy with success. I immediately sent for some, and, without any previous preparation of the patient, gave him three drachms. He was a large, powerful man, and this producing no effect, in four hours afterwards the same dose was repeated. It now operated very freely and frequently, and with the fourth stool a large tapeworm, six yards long, was passed.

"The result was so satisfactory, that I have continued to employ the remedy whenever a case presented itself; and I have now given it in sixteen different cases, and in all without a failure. As far as my experience goes, I have found it a better and more certain remedy than either turpentine or kousso, and much less disagreeable to take than either of these remedies.

"In none of my cases subsequent to the first did I ever exceed for a single dose three drachms. This usually purges from five to seven times, and the worm is usually expelled dead in the fourth or fifth stool.

"In two of the later cases in which I administered it in hospital, both patients recently recovered from fever, and still weak, the dose of three drachms purged very violently—from a dozen to fourteen times. In three subsequent cases I reduced the dose to 1½ drachms, and no action on the bowels succeeding it, I gave in six hours afterwards half an ounce of castor-oil.

[1] *Medical Times and Gazette*, Dec. 19, 1857, p. 628.

[2] *Indian Annals of Medical Science*. Ed. 2, No. 1, p. 284. Calcutta, 1854.

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This acted four or five times, and in each case the worm was passed dead.

* * * * *

"In almost every case the long slender neck of the worm appeared in the motion.

"To a native child of five years of age, I gave a dose of 40 grains, and a tape-worm was duly expelled. The drug usually purges speedily. In about half the cases, some degree of nausea and slight griping were experienced; in the remaining half, no inconvenience whatever was sustained, some of the patients declaring it to be the easiest purge they had ever taken in their lives.* * * * "

Dr. Mackinnon's experience.

Dr. Mackinnon gives the following summary as the result of his experience:

1. That *Kamala* is a safe and efficient remedy for tapeworm, and more certain than either turpentine or kousso.
2. That to a strong European 3 drachms may be safely given as a dose.
3. That to a person of feeble habit or to a female, 1½ drachms, followed, if necessary, by half an ounce of castor-oil, is a sufficient dose.

Since the paper from which the foregoing are extracts was published, Dr. Mackinnon has stated[1] that in subsequent more extensive trials of Kamala, during which he has administered it to nearly 50 patients, in two instances only was no worm expelled.

Dr. Anderson.

Dr. Anderson, Assistant-Surgeon, 43rd Regt. Light Infantry,[2] states that the occurrence of tapeworm is very common among the Europeans serving in the Punjab, and that it is also prevalent among the Mussulman population of that province.

"The vermifuge properties of Kamala," writes Dr. Anderson, "are as well marked as those of any of the best reputed anthelmintics, not excepting the Abysinnian remedy *Kousso*. The only objection to it is, that when the powder is used, considerable nausea occasionally follows, but certainly not more than what is produced by the sickening preparation of pomegranate root and other anthelmintics.

[1] *Indian Annals of Medical Science*, vol. iii. (1856), p. 86.

[2] On *Rottlera tinctoria*, as an article of the Materia Medica. *Indian Annals of Medical Science*, vol. iii. (1856), p. 82.

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Dr. Anderson.

"After three drachms of the powder have been administered the worm is usually expelled in the third or fourth stool. It is generally passed entire, and almost always dead, and in all the cases I have examined (about 15), I was able to detect the head. In only two cases do I know of the worm being passed alive. The advantage of the tincture over the powder consists in its action being more certain and milder, and in it being rarely accompanied by nausea and griping. In two or three cases, only two or three stools followed the dose usually given, and the worm was expelled in the second stool; in one patient, only one stool was caused by the medicine, and in it the worm came away dead."

Dr. Anderson alludes to 95 cases of tapeworm in which *Kamala* was prescribed, and of this number he was aware of only two in which no worm was expelled. Of these 95 cases, 86 were European soldiers, 8 were Mussulman natives, and one was a Hindu of the lowest class. All these persons were in the habit of indulging freely and constantly in animal food, and among this class tapeworm is common: those, on the other hand, whose animal diet is less copious are less liable to tænia, while among several native regiments, Hindu Sepoys and servants, says Dr. Anderson, whose food is entirely vegetable, the parasite is unknown.

Dr. C. A. Gordon.

Dr. C. A. Gordon's experience of the efficacy of Kamala corresponds entirely with that of Drs. Mackinnon and Anderson.

He observes,[1] "With Kamala there is no unpleasant effect. It is not even necessary to take a dose of purging medicine as a preparative; and beyond a trifling amount of nausea and griping in some instances, no unpleasant effects are experienced; while by far the greater number of persons to whom it is administered suffer no inconvenience whatever beyond what they would from a dose of ordinary purging medicine."

The observations of Dr. Gordon relative to the occurrence of tænia are confirmatory of those of Dr. Anderson, and are to the effect that the free use of animal food of very indifferent quality among the British troops in the N. W. Provinces must be regarded as the cause of the prevalence of the malady. In

[1] *Medical Times and Gazette*, May 2, 1857, p. 429.

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the case of soldiers stationed at Peshawur, tapeworm is so common, that it is believed that every third man suffers from it during the two years that the regiment usually remains there. To give Dr. Gordon's own words:—

Habits of swine and cattle in India.

"Those who have escaped the misfortune of having had to pass some years in India, can form no idea of the vast herds of lean, half-starved pigs that roam over the fields and waste grounds in the vicinity of villages; neither can they have any conception of the nature of the food on which these pigs subsist."

After some revolting details as to the habits of swine in India Dr. Gordon continues:

"Pigs, however, are not the only animals that live in this filthy manner in India. Cattle and sheep, that are so particular in their food in Britain, acquire degenerate tastes in India; and it is needless to enter into similar particulars regarding ducks, fowls, turkeys, and pigeons, all of which are more or less used as food by our countrymen there."

Dose.

The dose of Kamala may be stated as from a $\frac{1}{2}$ drachm to 3 drachms suspended in water: a single dose is frequently found sufficient, and in general it is not necessary to give any other medicine before or after. In some cases, however, where but a small dose of Kamala has been administered, castor-oil has been afterwards given with good effect. Dr. Gordon has prescribed Kamala in the dose of 1 drachm, repeated at intervals of three hours.

Tincture of Kamala.

Kamala may also be given in the form of Tincture; the formula for which, recommended by Dr. Anderson, is as follows:—

℞ Kamalæ, ℥vj.
Spiritûs rectificati, f℥xvj.
Macera per biduum et cola.

An ethereal tincture may be prepared of the same strength, but it is said to offer no particular advantage over the alcoholic.

The dose of *Tinctura Kamalæ* is from ℥j to ℥iv, diluted with some aromatic water. [N. Repert. f. Pharm. vii. 145.]

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ON THE USE OF COFFEE-LEAVES IN SUMATRA.

(*Benutzung der Caffeeblätter in Sumatra.*)

THE existence of caffeine in the leaves as well as in the berries of the coffee-plant has attracted some attention, and a project for substituting them for those of the tea plant has been actually devised by Dr. John Gardner, of London. According to this gentleman the leaves require to be subjected to a certain process of preparation before they are used. What this process is I am unable to state; but specimens of the prepared coffee-leaves were placed by Dr. Gardner in the Great Exhibition of 1851, together with the caffeine extracted from them, since which time advertisements have appeared in the Ceylon papers soliciting tenders for the supply of coffee-leaves by the ton.

Dr. Gardner's prepared coffee-leaves.

Whether these advertisements have met with a response I know not, but in March last my attention was drawn to a letter signed "*An Old Sumatran*," published in the *Overland Singapore Free Press* for Jan. 3, 1853. This letter, which was reprinted in the *Pharmaceutical Journal* for March (vol. xii., p. 443), states, that on the western side of the island of Sumatra an infusion of torrified coffee leaves is of universal consumption among the inhabitants, so much so indeed as to be regarded as one of the very few necessaries of life.[1]

Upon applying to the writer of this letter, who proved to be N. M. Ward, Esq., of Padang, I speedily received the following more detailed communication, since which a box of prepared Sumatran coffee-leaves, kindly forwarded by him, has reached my hands:—

N. M. Ward.

"PADANG, 15*th May*, 1853.

"DEAR SIR,—It is not without satisfaction that I learn that the notice inserted in the *Singapore Free Press* on the use of the Coffee-leaf in Sumatra has attracted attention, and obtained increased publicity through the medium of the *Pharmaceutical Journal*. Although long aware of its value as an

[1] This employment of coffee-leaves was not previously unnoticed. Brande, in his *Manual of Chemistry* (Lond. 1848, vol. ii., p. 1616), briefly states that the leaves of the coffee-plant are used in Java and Sumatra as a substitute for tea, and that it is probable they contain *theine*.

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article of diet among the natives here, it never occurred to me that it might be introduced successfully as such at home, until I learnt from the *Free Press* that a patent had been taken out by Dr. Gardner. It then struck me that as its adoption in Europe would unquestionably be attended with important advantages to the labouring classes, a knowledge of the fact of its general use here might be of service, by giving that confidence in it which must necessarily be wanting to a new and untried article. The fact of its being the only beverage of a whole population, and of its having from its nutritive qualities become an important necessary of life, will be a sufficient guarantee of its safety as an article of diet, and of its freedom from deleterious effects.

Dr. Gardner's patent.

"The natives have a prejudice against the use of water as a beverage, asserting that it does not quench thirst or afford the strength and support the coffee-leaf does. With a little boiled rice and infusion of the coffee-leaf, a man will support the labours of the field in rice-planting for days and weeks successively, up to the knees in mud, under a burning sun or drenching rains, which he could not do by the use of simple water, or by the aid of spirituous or fermented liquors. I have had opportunity of observing for twenty years the comparative use of the coffee-leaf in one class of natives, and of spirituous liquors in another, the native Sumatrans using the former and the natives of British India settled here the latter, and I find that while the former expose themselves with impunity for any period to every degree of heat, cold, and wet, the latter can endure neither wet nor cold for even a short period without danger to their health.

Advantages.

"Engaged myself in agriculture, and being in consequence much exposed to the weather, I was induced several years ago, from an occasional use of the coffee-leaf, to adopt it as a daily beverage, and my constant practice has been to take a couple of cups of strong infusion with milk in the evening as a restorative after the business of the day. I find from it immediate relief from hunger and fatigue, the bodily strength increased and the mind left for the evening clear and in full possession of all its faculties. On its first use, and when the leaf has not been sufficiently roasted, it is said to produce *vigilance*, but I am inclined to think that where this is the case, it is rather by adding strength and activity to the mental faculties, than by inducing nervous excitement. I do not recollect this effect on myself except once, and that was when the leaf was insufficiently roasted.

Personal testimony.

* * * * *

1853.

Native use.

"As a beverage the natives universally prefer the leaf to the berry, giving as a reason that it contains more of the bitter principle and is more nutritious. They are not unacquainted with the extract in a half solid form obtained by decoction, but in the lowlands I am not aware that they apply it to any particular purpose. The roasted leaf used to form an article of trade betwixt the coffee districts of the interior and the lowlands of the coast, but since the government monopolized the produce, this trade has in a great measure ceased, the natives believing the sale of the leaf as well as that of the berry forbidden. In the lowlands, coffee is not planted for the berry, being not sufficiently productive; but the people plant about their houses for the leaf for their own use, not however to the extent of the demand, so that in the settlement of Padang they are obliged to have recourse to the berry mixed with a portion of burnt rice, without which the beverage would be too dear for them. It is an undoubted fact, however, that everywhere they prefer the leaf to the berry.

Roasting.

"The sample I have the pleasure to send, is the produce of my own ground, properly prepared by a native well acquainted with the process. The best mode of roasting, he says, is by holding the leaves over the clear flame of a fire made of dry bamboo. The fireplace should be circular, of brick or other material, two feet deep, two feet in diameter at bottom inside, and one-and-a-half at top with a small door-place on one side for introducing the fuel. The reason for using bamboo as fuel is, that it produces but little smoke, and *that* little containing no creosote, does not adhere to the leaf. When sufficiently roasted, as described in the *Singapore Free Press*, the leaves have a brownish buff colour, and are then separated from the stalks, which are arranged in the slit of a stick afresh and roasted by themselves. The natives pound the whole of these roasted stalks in a mortar and mix them with the leaf for sale; but as the bark only contains extract, it is better to rub off this betwixt the hands and to reject the wood.

* * * * *

Culture.

"I have already remarked that whilst the culture of the coffee-plant for its fruit is limited to particular soils and elevated climates, it may be grown for the leaf wherever within the tropics the soil is sufficiently fertile. This extensive habitat, if I may so term it, added to its nutritive qualities and freedom from deleterious principles, points it out as the best adapted of all the productions affording caffeine for general

consumption; and if it should turn out that the article can be sent to distant countries without deterioration, I shall have every confidence in its ultimate adoption for general use. 1853.

"The price here of the leaves prepared for use, is generally about $1\frac{1}{2}d.$ a pound; and I suppose it may be prepared and packed for the European market of good quality for $2d.$, affording sufficient profit to the planter and bringing it within reach of the poorest classes of Europe."

Infusion of coffee-leaves.

Such is Mr. Ward's communication. The sample which he has sent arrived in excellent condition and appears to have been very carefully prepared. It consists of tolerably regular fragments of shining leaves mixed with pieces of stalk. Its colour is deep brown; its odour somewhat like that of a mixture of coffee and tea, and extremely fragrant. Immersed in boiling water a transparent, brown infusion is obtained, which when made sufficently strong, forms, with the addition of sugar and milk, a beverage by no means unpalatable.

Caffeine.

Caffeine, as is well known, is a crystallizable nitrogenized vegetable principle,[1] existing in the berries of the coffee shrub, in the leaves of the tea-plant of China, in the *Yerba de Maté*, or Paraguay Tea, of South America, and, as MM. Berthemot, and Dechastelus have proved,[2] in *Guarana*, the basis of a favourite beverage in some parts of Brazil. The plants affording these productions occupy very different positions in the vegetable kingdom; the coffee-plant belongs to the natural order *Rubiaceæ*, the tea-plant to *Camellicæ*, the Paraguay tea (*Ilex Paraguariensis*, St. Hil.) to the *Ilicineæ*, and the Guarana-plant (*Paullinia sorbilis*, Mart.) to *Sapindaceæ*.

Remarkable fact.

It is not a little remarkable that Caffeine has hitherto been detected only in plants which are broadly distinguished from each other in their botanical characters; but it is yet more extraordinary that these plants should have been *independently* selected as articles of diet by semi-barbarous nations inhabiting widely-separated portions of the globe.

[1] Its composition is expressed by the formula $C_8 H_5 N_2 O_2$. Theine and Guaranine are identical with Caffeine.

[2] *Journ. de Pharm.* (Aug. 1840), tome xxvi., p. 518.

1853.

NOTES UPON SOME SPECIMENS OF SCAMMONY.

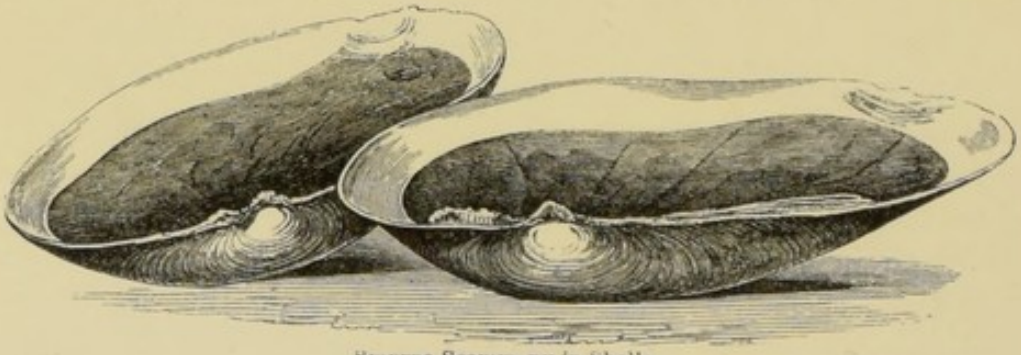
HAVING through the kindness of Sidney H. Maltass, Esq., of Smyrna, received several specimens illustrating his interesting paper on the production of Scammony, I believe that a short account of them will not be unacceptable.

Samples of Scammony from Mr. Maltass.

I will premise it by stating that Mr. Maltass has resided at Smyrna for the last eighteen years, where, as a matter of business he has had constant opportunity for becoming conversant with all that relates to the drug as met with at that place: indeed, as he informs me he has actually collected it with his own hands in order to become the more practically acquainted with it.

To Mr. Maltass I am indebted for specimens of the following, viz. :—

1. *Pure Scammony in shells*, collected near Symrna.



Smyrna Scammony in Shells.

It is remarkably transparent even when viewed in the shell; its colour is a pale golden brown, scarcely as intense as that of common glue, of which its general appearance is suggestive. A white emulsion is produced on rubbing the surface with a wetted finger.

This scammony affords 91·1 per cent. of resin soluble in ether.[1]

2. *Pure Scammony from the neighbourhood of Smyrna:* a portion apparently of a cake about an inch in thickness; colour

[1] In examining the solubility of scammony in ether, it is needful to dry the scammony until it ceases to lose weight, a precaution which must of course be observed in weighing the residue also.

1853.

in the mass deep brown, in small fragments pale golden-brown, translucent; although compact, readily broken, fracture glossy, showing not very numerous air-cavities; odour cheesy. A white emulsion is produced immediately it is rubbed with the moistened finger; no traces, either external or internal, of any calcareous contamination. It affords 88·2 per cent. of resin soluble in ether.

An experienced judge of scammony assures me that he has never observed any of this quality in the London market.

Pure Angora Scammony.

3. *Pure Scammony from the neighbourhood of Angora* in a somewhat irregular mass, probably part of a cake about 1½ inches thick. It is very pale in colour, small fragments appearing of a yellowish brown, and translucent. It is distinguishable from No. 2 by being much cracked, a quality which imparts to it a pale colour when in mass, and renders it extremely friable. The fractured surface is shining, readily affording a white emulsion when rubbed with the moistened finger.

This is a very pure scammony, containing 89·4 per cent. of resin soluble in ether. The matter insoluble in ether is nearly colourless, which is also the case with that of Nos. 1 and 2. That from No. 1 appeared under the microscope chiefly as an amorphous, gelatinous substance, soluble in water, and in which no starch-granules were observed.

Pure black Scammony.

4. *Pure Black Scammony* as collected in shady places. My sample appears to have formed part of a cake upwards of an inch thick. It is remarkably opaque and black even in small fragments; very thin splinters, however, show it of a greyish hue. It is compact yet very brittle; its fracture glossy; it possesses the usual scammony-odour, and affords a dingy emulsion when wetted and rubbed. My experiments prove it to contain 87·9 per cent. of resin soluble in ether.

This scammony bears some resemblance externally to Solazzi extract of liquorice. It is unknown in English trade.

Adulterated Scammony.

5. *Smyrna Scammony "adulterated,"* says Mr. Maltass, "with magnesian earth[1] and vegetable matter to the extent of 20 or 30 per cent.; such is sold in London as *Lachryma scammony.*"

[1] Or rather carbonate of lime.

1853.

This scammony is blackish, rather brittle and opaque, either compact or frothy: fracture not bright, readily affording an emulsion. Treated with ether, I obtained from it 79·3 per cent. of matter soluble in that menstruum.

6. *Angora Scammony adulterated* with calcareous earth and starch to the extent of 65 to 68 per cent. This scammony is heavy and greyish with a dull clayey fracture. It is evidently very impure, affording only 33·4 per cent. of matter soluble in ether.

7. *Imitation Scammony*, "prepared," says Mr. Maltass, "from the refuse of scammony gathered by the Turkish peasants after the extraction of the resin, with the addition of gum arabic and rosin."

This substance is in hard, opaque, black, irregular cinder-like masses. I have obtained from it 44·28 per cent. of resin soluble in ether. It is needless to comment on the activity of such a compound, yet I am assured that even this would fetch 10*s*. per pound in the London market.

Resin of Scammony.

8. *Pure Resin of Scammony*, extracted from Smyrna scammony of 1846. Viewed in the mass it is blackish, in small fragments transparent and greenish-brown: very brittle, outer surface and fractured surface brilliant. A very scanty emulsion is produced when the surface is moistened and rubbed.

9. *Resin of Scammony*, rather less pure than No. 8.

10. *Pure Resin of Angora Scammony:* transparent and of a golden-brown even in the mass. Like the natural Angora scammony, it is cracked in all directions and extremely friable. When moistened and rubbed no emulsion is perceptible.

Characters of pure Scammony.

In conclusion I may remark that the striking characters of pure *natural* scammony, I mean the *unmixed* inspissated juice, are its *pale, yellowish-brown hue, its transparency, its great brittleness, its property of readily affording a white emulsion when rubbed with water*, and *the scanty amount of a white residue which it leaves upon being treated with ether.* All these characters are well shown in samples 1, 2, and 3.

The opaque *Black Scammony* No. 4 although marked *pure* is

regarded by Mr. Maltass as questionable. It is certainly a very curious variety, which, if an entirely natural product, would form an exception to the above remarks. 1853.

Scammony-*resin* is distinguishable from scammony by affording hardly any emulsion when wetted and rubbed.

ON THE FEBRIFUGE PROPERTIES OF THE OLIVE (*OLEA EUROPÆA*, L). 1854.

(*Olea Europæa als Fiebermittel.*)

In a letter which I have recently received from my friend Mr. Sidney H. Maltass, of Smyrna, he draws attention to the value of the leaves of the olive (*Olea Europæa*, L.) as a febrifuge. The passage is so interesting that I shall make no apology for quoting it at length:

Letter on olive leaves from Mr. Maltass.

"... I may here tell you of a discovery I made in 1843, which has proved valuable. I was in the island of Mytelene, and at a time when fever and ague of the worst description were raging in the island;—in fact, it was so bad that death ensued frequently after a week or ten days. The small quantity of quinine at the druggist's was soon exhausted, and I could procure none to administer to patients. Knowing that biberine and salicine were often used for fever and ague, I turned over in my mind all the bitters I could think of which might prove effectual. Many were poisonous, and I rejected them, then thought of *olive leaves*, and after several trials made on myself, I commenced administering doses of a decoction of the leaves, say two handfuls boiled in a quart of water till evaporation had reduced it to a pint. This I gave in doses of a wine-glassful every three or four hours. Obstinate cases of fever gave way before it; and for many years I have found it more effectual than quinine.

"I have recommended it to our medical men, and although at first they ridiculed the idea, they all use it now. It is a most valuable remedy for the poor in an olive-growing country."

This discovery is the more interesting since it corroborates some observations upon the same subject made in France many years previously.

1854.

French observations.

So early as in the year 1811, M. Cazals, of Agde, pointed out the good effects he had observed produced by the administration of olive leaves in cases of intermittent fever,[1] and a chemical examination of them (as suggested by M. Cazals) was soon afterward made by M. Ferrat.[2]

Favourable results also attended some similar trials made in France by Dr. Bidot, and in Spain by Drs. Béguin and Faure.

Investigations by Dr. Pallas.

In 1828 a more elaborate investigation of the subject was published by Dr. E. Pallas.[3] He states that olive leaves are sometimes employed as a febrifuge by the physicians of Spain, that during the war in that country in 1808 to 1813, the French *Officiers de Santé* frequently prescribed them as a substitute for cinchona bark. In several cases of intermittent fever in the military hospital at Pampeluna, Dr. Pallas observed marked beneficial effects from the use of the *bark* of the olive administered in the form of an alcoholic extract.

Vauqueline.

Dr. Pallas analyzed[4] the leaves as well as the young bark, and found them to contain, among other less important constituents, a crystallizable substance designated by him *Vauqueline*, and a bitter principle, to which latter he ascribes most of the febrifuge properties of the plant. As the *young* bark contained more of these matters than either the leaves or the *old* bark, he concluded that it was the preferable part for medicinal use.

Vauqueline, according to this author, is a colourless, inodorous solid, having a slightly sweet taste. It crystallizes in micaceous plates, or sometimes in stellate prismatic crystals, which are very soluble in water at all temperatures. It scarcely dissolves in cold alcohol, though readily in boiling alcohol, from which it precipitates as the solution cools. Its aqueous solution imparts a faint blue to reddened litmus paper. Young olive bark afforded Dr. Pallas nearly 2 per cent. of *Vauqueline*.[5]

[1] *Bulletin de Pharmacie*, tome iii., p. 83.
[2] *Ibid.*, tome iii., p. 433.
[3] *Journal Universel des Sciences Médicales*, tome xlix., p. 257. *Recueil de Mémoires de Médecine, de Chirurgie, et de Pharmacie Militaires*, vol. xxiii. (1827), p. 152 ; vol. xxvi. (1829), p. 159.
[4] *Recueil*, vol. xxiii., p. 152.
[5] *Vauqueline* would appear to be identical with the substance designated

1854.

Therapeutic value of olive bark and leaves.

Of the **pharmaceutical preparations** of olive bark, the more useful appear to be a tincture and an alcoholic extract. The tincture is recommended to be made by digesting one part of the young bark in eight parts of spirit of wine of sp. gr. ·867. It may be administered as *Tinctura cinchonæ*. The dose of the extract is half a drachm diffused through a little water.[1]

The varied and independent testimonies in favour of the febrifuge properties of the olive, seem to render it deserving of a more extended investigation, both as to its medicinal and its chemical properties. The *Vauqueline* of Pallas should be re-examined, and its connexion with the crystallizable principles obtainable from allied plants should be studied.

That some therapeutic value does really attach to the bark and leaves of the olive is supported by the fact that both the lilac (*Syringa vulgaris*, L.) and the ash (*Fraxinus excelsior*, L.), plants of the same natural order, are reputed to possess febrifuge properties, and employed on that account in some parts of the Continent.

ON SOME RARE KINDS OF CARDAMOM.

1855.

(*Seltene Cardamomen.*)

"Nulla res est fortasse in re Pharmaceuticâ magis litigiata quàm Cardamomi notitia."—GEOFFROY, *Tractatus de Materiâ Medicâ*, t. ii., p. 364.

THE natural history of the various fruits of the order *Zingiberaceæ*, grouped together under the name of *Cardamom*, has always proved a subject of difficulty to pharmacologists. Probably one cause of this is the imperfect manner in which botanical specimens of these plants have been preserved (occasioned principally by the succulent nature of their flowers and fruits), and a second may be due to the fact that comparatively but few botanists have been able to labour for a sufficient length of time

by Landerer *Olivine* (*Turner's Chemistry*, 7th ed., 1842, p. 1125). The latter name is however objectionable, it having been applied to two other bodies, namely, to the olive-green crystalline substance obtained by the action of sulphuric acid on Salicine, and to a variety of the mineral *Chrysolite*.

[1] Chereau, in *Journal de Chimie Médicale*, tome iv. (1828), pp. 543–546.

1855. in the hot and humid regions in which *Amomum* and allied genera chiefly abound.

Dr. Pereira. Among the pharmacologists to whom we are indebted for researches on this difficult subject is the late illustrious Dr. Pereira, who, with the energy which so signally marked his character, was enabled to throw much light on the pharmacological history of various species of *Amomum* occurring on the West Coast of Africa, and affording the different varieties of *Grains of Paradise* or *Melliguetta Pepper*.

Dr. Hooker. Important botanical observations have more recently been made by Dr. Joseph Dalton Hooker,[1] who had had the advantage of an interesting series of specimens of *Amomum* collected with much labour by Dr. W. F. Daniell on various parts of the West Coast of Africa.

Guibourt. Professor Guibourt, of Paris, has contributed many accurate observations on the same subject, and especially some notices and figures of certain species of Cardamom which, although rarely met with in Europe, are important articles of trade in the Eastern Archipelago and in China.

It is to these latter species, namely, the Cardamoms of Siam, Cochin-China, Tonquin and China, that the present paper refers; and I must preface it by saying that my object is to place the information we possess in a collected form, and to point out the desirableness of further researches, rather than to communicate much that is new. It is my hope that Europeans residing in the countries in question, who take an interest in natural history, may be stimulated to some exertion to discover the botanical origin, and obtain further accounts regarding the culture, the collection, and the uses of these productions, which, apart from their interest to the pharmacologist, are derived from plants, many of which, remarkable for a splendid inflorescence, would become valuable additions to the horticultural collections of this country.

[1] Hooker's *Journal of Botany*, vol. iv., p. 129; vol. vi., p. 289.

LARGE ROUND CHINA CARDAMOM. (FIG. 1.)

Large round China Cardamom.—Pereira, *Elements of Materia Medica*, part ii. (1840), p. 699, fig. 133.

Large round China Cardamom.—Pereira, *Elem. of Mat. Med.*, ed. 2, vol. ii. (1842), p. 1035, fig. 203.

Autre Cardamome rond de la Chine.—Guibourt, *Histoire des Drogues*, éd. 4, tome ii. (1849), p. 215, fig. 115.

Round Cardamom.—Pereira, *Elem. of Mat. Med.*, ed. 3, vol. ii. (1850), p. 1139, fig. 255, 256.

Groszes rundes Chinesische Kardamom.—Martiny, *Encyklopädie der Medicinisch-pharmaceutischen Naturalien und Rohwaarenkunde*, Bd. ii. (1854), p. 776.

草蔻 *Tsaou-kow.*

Fine specimens of this fruit were procured by my brother, Mr. Thomas Hanbury, at Singapore in the drug shops of which place, he tells me, it appears by no means plentiful. Deprived of the husk (fig. 2), I have also received it from Canton and

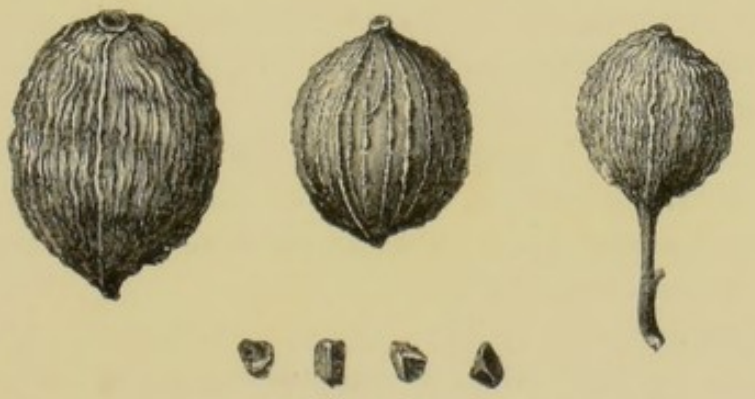


FIG. 1.—*Large round China Cardamom* (fruits and seeds).

Shanghai, from the latter place under the above-mentioned character, *Tsaou-kow*, the same name, I presume as that given by Loureiro, as applied to his *Amomum globosum*.[1] In the Sloanian collection in the British Museum, there is a small specimen of this fruit.

[1] *Flora Cochinchinensis.* Berolini, 1793, t. i., p. 6.

1855.

Large round China Cardamom.

The *Large Round China Cardamom* varies considerably in size, my specimens being from $1\frac{2}{10}$ inches to $\frac{6}{10}$ of an inch in length. The capsules are somewhat oval or globular, pointed at either extremity, obscurely three-sided (except at the base where the triangular character is strongly marked); they are sometimes attached to a long pedicel. The pericarp closely invests the mass of seeds; it is brown, thin, and strongly marked externally with interrupted longitudinal ridges; it is hardly aromatic. The seeds are coherent into a three-lobed mass (fig. 2); they are generally light greyish-brown angular with a deep furrow on one side; they have a slight aromatic odour and taste, the latter suggestive of Thyme (*Thymus vulgaris*), though much weaker.



Fig. 2.

This Cardamom is a native of the South of China, and of Cochin-China, whence it is exported. It appears to be much employed in Chinese medicine as a stomachic.

SMALL ROUND CHINA CARDAMOM. (FIG. 3.)

Small round China Cardamom.

Cardamome rond de la Chine.—Guibourt, *Hist. des Drogues*, éd. 4, tome ii. (1849), p. 215, figs. 113, 114 (excluding other synonyms).

Until recently I considered this Cardamom as simply a variety of the preceding, but the decided opinion of its distinctness expressed to me by Professor Guibourt induces me to place it under a separate head.

Dr. Pereira seems to have confounded it with his "*Round Cardamom*, fig. 255," which is a representation of M. Guibourt's "*Autre Cardamome rond de la Chine*," as a comparison of the woodcuts will plainly show.

Specimens of the *Small round China Cardamom* are preserved in the Musée d'Histoire Naturelle at Paris. M. Guibourt likewise possesses specimens, and has kindly presented me with one. I have never received this Cardamom direct from China.

The following description of the *Small round China Cardamom* is taken chiefly from M. Guibourt's work :—

1855.

Guibourt.

Capsules pedicelled nearly spherical, from seven to eight lines in diameter, slightly striated longitudinally, and much wrinkled in all directions by drying; it is probable, however, that the fruit was smooth when fresh. The capsule is thin, light, easily torn, yellowish externally, white within. The seeds form a globular coherent mass. They are rather large and few in number, somewhat wedge-shaped, of an ashy-grey, a little granular on the surface, and present on the outer face a bifurcate furrow shaped like a **Y**. They possess a strongly aromatic odour and taste.



Fig. 3.—*Small round China Cardamom.*

To this description I may add that, compared with the *Large round China Cardamom* the capsules in question are more wrinkled in a network manner, more fragile and thin, and (from immaturity ?) much less adherent to the mass of seeds ; they are more globose, not triangular at the base, but flat, or even depressed like an apple. Their colour, in all the specimens I have seen, is a brownish-yellow. I cannot confirm M. Guibourt's remark as to the highly aromatic properties of the seeds.

Amomum globosum of Loureiro.

This Cardamom, which appears to bear the same Chinese name as the foregoing, is attributed by M. Guibourt to the *Amomum globosum* of Loureiro.

HAIRY CHINA CARDAMOM. (FIGS. 4, 5.)

Hairy China Cardamom.

Small round China Cardamom.—Pereira, *Elem. of Mat. Med.* Part ii. (1840), p. 699.

Small round China Cardamom.—Pereira, *Elem. of Mat. Med.* ed. 2, vol. ii. (1842), p. 1035, fig. 204.

Cardamome poilu de la Chine.—Guibourt, *Hist. des Drogues*, éd. 4, tome ii. (1849), p. 214, fig. 112.

Hairy China Cardamom. Hairy round China Cardamom.—Pereira, *Elem. of Mat. Med.*, ed. 3, vol. ii. (1850), p. 1140, fig. 257, 258.

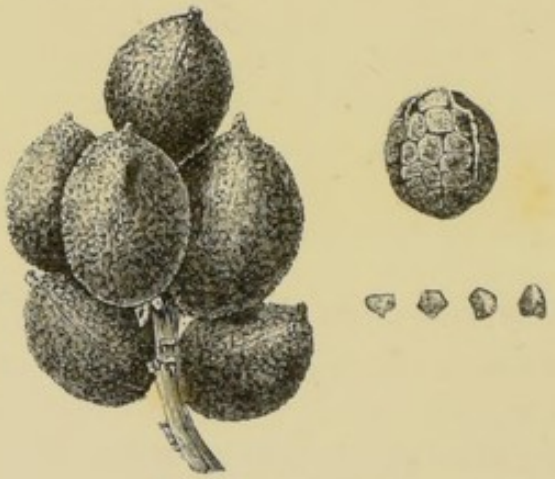
Cardamoma Chinensia muricata ; Weichstachelige Kardamomen.—Martiny, *Encyklopädie der Med. Pharm. Naturalien und Rohwaarenkunde*, Bd. ii. (1854), p. 776.

陽春砂 *Yang-chun-sha.*

1855.

Amomum villosum ?

Professor Guibourt has suggested that this fruit may be the produce of the *Amomum villosum* of Loureiro, an opinion in which the late Dr. Pereira concurred. Loureiro's description is, however, quite insufficient for determining this from the fruit alone; and as there is, unfortunately, no specimen of *Amomum villosum* either in the British Museum or in the Musée d'Histoire Naturelle of Paris, in each of which institutions some portion of his herbarium yet exists, and as the species has been recognized by no other author, it seems at present hardly possible to decide this point.[1] According to Loureiro, his *A. villosum* is called in Chinese *Sŏ Xā m'i*[2] 縮砂蜜—a name under which I have never received the *Hairy China Cardamom.* Specimens of this cardamom are preserved in the Sloanian collection in the British Museum.



Hairy China Cardamom.

Fig. 4—Fruit. Fig. 5—Seeds.

Samples from Singapore.

From my brother, Mr. Thomas Hanbury, I have received some very fine samples purchased by him at Singapore. I am also

[1] M. Laségue has stated in his *Musée Botanique de M. B. Dellessert* (p. 348), that the Academy of Lisbon possesses the greater part of Loureiro's herbarium. I regret to find this does not appear to be the case. M. Francisco Antonio Pereira Da Costa of Lisbon has informed me, that, so far as he can ascertain, the herbarium in question never existed at the Academy; it was supposed to have formerly belonged to the Museu da Ajuda; but upon the removal of that establishment to the Academy, no trace of it could be discovered.

[2] Now usually spelt *Sŭh-sha-meĭh.* The Chinese characters are taken from the *Pun-tsaou,* where there is a coarse woodcut of the plant.

indebted to Mr. Lockhart, of Shanghai, and to Mr. Lobscheid, of Hong Kong, for specimens procured in the drug shops of China. 1855.

The *Hairy China Cardamom* is sometimes sold attached to the stalk, sometimes removed from it.

Botanical characters of Hairy China Cardamom.

The scape, which when perfect, is about three inches long and reclinate, bears as many as eight or ten capsules upon its superior extremity. The capsules are from six to ten lines in length. In the dried state they are oval, occasionally nearly spherical, more or less three-sided, bluntly pointed with a scar at the summit, rounded at the base, and attached by a pedicel one to two lines long. The pericarp is externally dark brown, marked with obscure longitudinal *striæ* and covered with asperities, which, after soaking in water proved to be short, thick, fleshy, closely-crowded spines. It has when bruised an aromatic and tar-like odour, the seeds have a similar tar-like odour and taste not unmixed with the aromatic warmth of the Malabar Cardamom ; they are angular, and upon the removal of the pericarp remain united in a three-lobed mass.

The scape is densely villous, especially at its upper extremity, but I can detect no hairs upon the pericarp. If Loureiro's *Amomum villosum* be identical with this species its specific name was probably taken from the short spine-like processes with which the pericarp is beset, and which pericarp Loureiro described as "*exterius obsessum villis multis, crassis,*"—a character, however, more applicable to another species than to this.

Medical use.

Mr. Lobscheid informs me that this Cardamom is said to grow in the province of Kwang-tung, and in the Yang-yun district of Southern China. It appears to be frequently used in medicine by the Chinese.

Loureiro states of his *Amomum villosum*, whose Cochin-Chinese name is *Sanhon*, that it occurs without cultivation in Qui-nhon and Phu-yen provinces of Cochin-China, and that its seeds are exported to China, where they are largely employed in medicine.

1855.

XANTHIOID CARDAMOM. (FIG. 6, 7.)

Xanthioid Cardamom.

Amomum with small round, brown-coloured fruits in clusters, No. 101 in W. Gomez's *Tavoy Catalogue,* 1827. MS. in the possession of the Linnean Society of London.

Amomum xanthioides,—No. 1956.—Wallich, *Catalogus Plantarum quas in itinere Burmanico a mense Augusti,* 1826, *ad finem Maii* 1827, *observavit N.W.* MS. in the possession of the Linnean Society.

Amomum? xanthioides.—Wall., *Catal. of the East Indian Herbarium,* No. 6557.

Among some specimens of drugs received from China through the kindness of my friend Mr. Lockhart, was a quantity of the capsules of a fruit resembling the *Hairy China Cardamom,* but differing from it in the much more spiny character of the pericarp.

Upon comparison, it proved identical with a species collected at Tavoy, Gulf of Martaban, in 1827, by Mr. W. Gomez, in whose MS. collecting-book (above quoted) it is defined as "*Amomum with small round brown-coloured fruits in clusters.*"

Dr. Wallich.

In Dr. Wallich's MS. Catalogue of Burmese Plants (entitled as above) occurs the following, in the doctor's own hand:—

"1956. *Amomum xanthioides,* Wall.—Very like *A. aculeatum,* Roxb., but differing seemingly in the linear-lanceolate not cordate leaves, and the fruit which consists in short rounded clusters from the repent root; it is of an oblong obtuse form, thickly covered with prickles. Seems a tall species. Tavoy. $\frac{12}{8}$27."

The next notice of *Amomum xanthioides,* I find in the MS. Catalogue of the East Indian Herbarium of the Linnean Society inserted thus:—

"6557. Amomum ? xanthioides, Wall. (A. aculeato Roxb. prox.). Tavoy W.G."

From this last entry, it will be oberved that a doubt seems to have been felt as to the genus of the plant in question, a doubt, I confess that appears to me groundless, if *Amomum aculeatum* is an admitted *Amomum.*

1855.

Specimens collected by Gomez.

The specimens of *Amomum xanthioides* collected by Gomez and now in the collection of the Linnean Society are without flowers, but well furnished with fruits, one bunch of which is represented in Fig. 6. I have carefully compared this species with its near ally *A. aculeatum* as figured by Roxburgh,[1] and also with the specimen preserved in the herbarium of the British Museum. In addition to the observation of Dr. Wallich,



Fig. 6.—Fruit of *Amomum xanthioides*, Wallich, from a specimen in the herbarium of the Linnean Society.

that in *A. xanthioides* the leaves are linear-lanceolate, while in *A. aculeatum* they are cordate [-lanceolate], I may remark that *A. aculeatum* appears to be a *much more robust* species, with larger fruit; it has besides the spines upon the pericarp not simple, but flattened and partially united two or three together, a character very evident in the dried specimen, though not well represented in Roxburgh's figure.

[1] *Asiatick Researches*, vol. xi., p. 344, pl. vi. *Vide* also *Flora Indica* (ed. Carey), vol. i., p. 40.

1855. The capsules of *Amomum xanthioides*, received by me under the name 砂仁殼 *Sha-jin-kŏ*,[1] had been deprived of seeds; indeed, the terminal syllable in the Chinese name signifies *husk* or *shell*. Yet from a few capsules which had escaped the shelling process, I had an opportunity of examining the seeds which, I suspected, were not unknown in the English market. I believed them to constitute the Cardamom *Seeds*[2] occasionally offered at the London drug sales, and which I had traced to Moulmein and Penang.

Bastard Cardamoms. This opinion has been unexpectedly confirmed. While this notice was in the hands of the printer, I received through the kindness of R. Padday, Esq., of Singapore, three samples of "*Bastard Cardamoms*" obtained from Bangkok in Siam. These *Bastard Cardamoms* have mostly been deprived of the husks, the seeds are either detached, or united with the partitions into three-lobed masses. But the fruits retaining the husk are so evidently those of *Amomum xanthioides* that I have no hesitation in referring the *Bastard Cardamoms* to that species. I also identify them with the Cardamom *Seeds* of the London market.

The seeds of *A. xanthioides* much resemble those of the Malabar Cardamom, but are not so rugose: they are, however, distinguishable by their peculiar aromatic taste and smell.

Capsules of *Amomum xanthioides*. The empty capsules received from China are mostly attached to a common stalk, which, when perfect, is about five inches long, and beset with the remains of sheathing bracts. The superior portion, which is much stouter than the rest, bears the fruits closely crowded together on short, bracted pedicels. No bunch in my possession bears more than twelve fruits, but from the number of pedicels on some specimens it would appear that the flowers at least are often twice as numerous. The capsules having been deprived of seeds are shrunken and compressed, but after soaking in boiling water they acquire their

[1] I do not attach much value to this Chinese name, which, I think, is sometimes applied to the *Hairy China Cardamom*.

[2] I mean the seeds *per se*. Malabar Cardamoms deprived of pericarp are, I believe, never imported.

proper volume (Fig. 7), becoming nearly spherical and about three-quarters of an inch in diameter. The pericarp is covered with long, acute, recurved spines, which are longest near the base. 1855.

I have received no information regarding the uses of these Cardamom husks, which, it would appear, are exported to China and there consumed.

By a letter from Robert Hunter, Esq., of Bangkok, addressed to Mr. Padday, I learn that the so-called *Bastard Cardamoms* are the produce of the Laos Country and of Cambodia, where Robert Hunter.

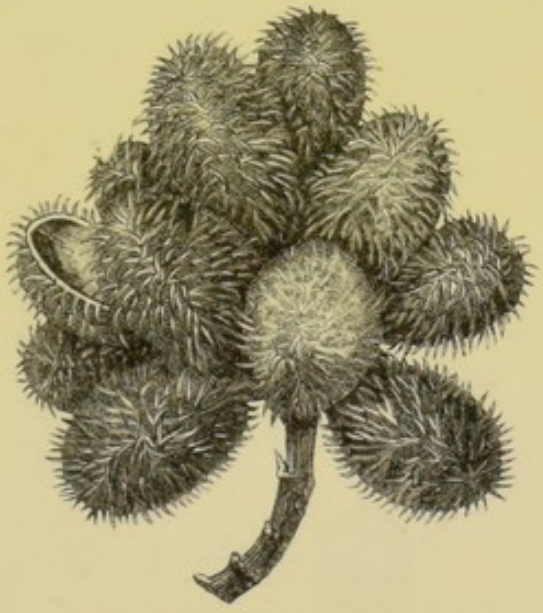


Fig. 7.—*Amomum xanthioides*, Wallich.

they grow wild in the more elevated regions of the mountain forests. Their commercial value is small, those of the first quality being worth in Siam about $3\frac{1}{2}d.$ sterling per pound.

It would be very interesting to procure perfect specimens of this curious species of *Amomum*, from which a complete description might be drawn up.

BITTER-SEEDED CARDAMOM. (FIG. 8.)

Cardamome noir de Gaertner.—Guibourt, *Hist. des Drogues*, éd. 3, tome ii. (1836), p. 287.

Black Cardamom—Gaertner.—Pereira, *Elem. of Mat. Med.*, Part ii. (1840), p. 699.—*Elem. of Mat. Med.*, ed. 2, vol. ii. (1842), p. 1036, fig. 205.

1855.

Bitter-seeded Cardamom.

Cardamome noir de Gaertner.—Guibourt, *Hist. des Drogues*, éd 4, tome ii. (1849), p. 214.

Black Cardamom.—Pereira, *Elem. of Mat. Med.*, ed. 3, vol. ii. (1850), p. 1140, fig. 259.

Cardamoma nigra ; Schwarze Kardamomen.—Martiny, *Encycklopädie der Med. Pharm. Naturalien und Rohwaarenkunde*, Bd. ii. (1854), p. 775.

Cardamome à Semences amères.—Guibourt MS.

益智子 *Yih-che-tsze.*

Very little is known of the origin of this Cardamom. By Professor Guibourt, who first described it, it was doubtfully referred to the *Zingiber nigrum* of Gaertner, a plant identical with *Alpinia Allughas* of Roscoe, but as Dr. Pereira has

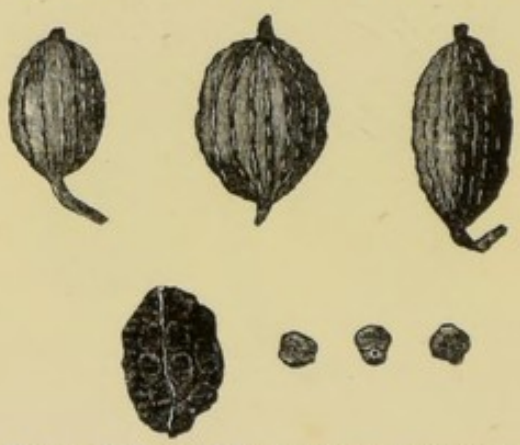


Fig. 8.—*Bitter-seeded Cardamom* (fruits and seeds).

Figured in the Chinese Herbal

pointed out[1] (and I can confirm his statement), it is totally different from the fruit of that species. In the *Pun-tsaou-kang-mŭh*, a celebrated Chinese herbal, there is a rude figure of the plant, which is stated to be indigenous to the island of Hainan. The MS. catalogue of the collection of Chinese drugs at the Royal College of Physicians of London, mention the province of Kwantung as its place of growth. It is probable that both statements are correct.

For a specimen of this Cardamom as met with in the drug-shops of China, I am indebted to the kindness of my friend

[1] *Elem. of Mat. Med.*, ed. 3, vol. ii., p. 1140.

1855.

Bitter-seeded Cardamom.

Mr. Lockhart. The capsules are mostly oval, some ovate-oblong, and a few nearly spherical, pointed at the extremities, 6 to 10 lines long. The pericarp is of a deep dusky-brown, coriaceous, devoid of hairs, beset longitudinally with interrupted ridges usually about 18 in number; it has an agreeable aromatic smell and taste. The seeds are obtusely angular and adhere firmly together; they are distinguished by an aromatic, *bitter, myrrh-like* taste.

There is a fine specimen of this Cardamom in the Musée d'Histoire Naturelle at Paris.

OVOID CHINA CARDAMOM. (FIG. 9.)

Ovoid China Cardamom.

Amomum medium.—Loureiro, *Flora Cochinchinensis*, ed. Willd. (1793), tome i., p. 5.

Cardamome ovoide de la Chine.—Guibourt, *Hist. des Drogues*, éd. 3, tome ii. (1836), p. 287.

Ovoid China Cardamom.—Pereira, *Elem. of Mat. Med.*, Part ii. (1840), p. 698, fig. 132; *Elem. of Mat. Med.*, ed. 2, vol. ii., (1842), p. 1035, fig. 202.

Cardamome ovoide de la Chine.—Guibourt, *Hist. des Drogues*, éd. 4, tome ii. (1849), p. 215, fig. 116.

Ovoid China Cardamom (*Alpinia alba*, Roscoe).—Pereira, *Elem. of Mat. Med.*, ed. 3, vol. ii. (1850), p. 1141, fig. 260.

Cardamoma Chinensia oviformia; Eiförmige Chinesische Kardamomen.—Martiny, *Encyklopädie der Med. Pharm. Naturalien und Rohwaarenkunde*, Bd. ii. (1854), p. 775.

草菓 *Tsaou-kwo.*

Professors Guibourt and Pereira have referred the *Ovoid China Cardamom* to *Amomum medium*, Loureiro; and, as I think, with good reason; but of the identity of this plant with *Alpinia alba*, Roscoe, the evidence, although generally admitted, is far from conclusive. Loureiro's description is incomplete; he did not see fresh flowers of his *Amomum medium*, no specimen of it exists in his herbarium, nor has a drawing of it been preserved.

1855. Moreover, Roscoe, in enumerating the synonyms of his *Alpinia alba*, has taken no notice of Loureiro's *Amomum*.[1]

But *Alpinia alba* is itself a plant known only by description; no figure of it is to be found, still less a specimen. I am assured by Sir W. J. Hooker it is noticed in none of the Indian Flora, and that it does not occur in any of the catalogues of plants cultivated in India.

Ovoid China Cardamom.

The *Ovoid China Cardamom* is a product of Southern China, and abundant in the drug shops of Singapore, as well as in

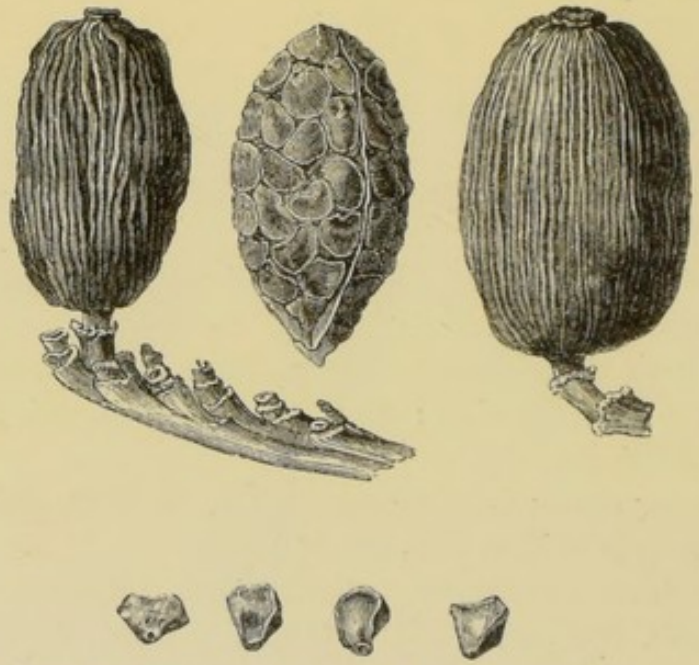


Fig. 9.—*Ovoid China Cardamom* (entire fruits, fruit deprived of pericarp, and seeds).

those of China. It is an oval or oblong, three-celled, three-valved and obscurely three-sided fruit, of from 1 to 1¾ inches in length. The pericarp is of a dusky-greyish brown deep striated longitudinally, thick and coriaceous, frequently covered on the surface with a whitish efflorescence; it is but slightly aromatic. The seeds are very large, often upwards of three lines in length, sharply angular and striated, having a powerful and peculiar aromatic smell and taste.

This Cardamom is remarkable for its large, hard, angular seeds,

[1] *Linn. Trans.*, vol. viii., p. 346.

1855.

which alone seem sufficient to prove its distinctness from the *Languas vulgare* of Kœnig, whose seeds are described in the *Observationes Botanicæ* of Retzius (*Fasc.* iii., pp. 64, 65) as "*Cardamomo minori simillima.*"

Ovoid China Cardamom.

The seeds of the *Ovoid China Cardamom* are used by the Chinese for a variety of disorders, and, according to Loureiro, are also employed as a condiment.

There are examples of the *Ovoid China Cardamom* in Dr. Burges's collection at the Royal College of Physicians, under the erroneous designation "*Grana Paradisi in capsulis.*"

At the Musée d'Histoire Naturelle at Paris, I have observed a specimen of the same fruit, labelled *Quâ-leu.*

GALANGA CARDAMOM. (FIGS. 10, 11.)

高良薑子 *Kaou-leang-keang-tsze.*

紅豆蔻 *Hung-tow-kow.*

I have applied the term *Galanga Cardamom* to a small medicinal fruit received under the above Chinese names from my friend Mr. Lockhart, of Shanghai.

Galanga Cardamom.

The specimen consists of capsules about half an inch in length and three lines in breadth, of an oblong form, somewhat constricted in the middle, or occasionally pear-shaped; some are obscurely three-sided. Each fruit is prominently crowned with the remains of the calyx; in a few, the lower extremity is still attached to a slender pedicel. Most of the capsules are much shrivelled on the outside, apparently from having been gathered while immature (Fig. 11); a few, however, retain a plump and smooth appearance (Fig. 10). The pericarp varies externally in colour (according to its maturity ?), from a pale to a deep reddish-brown; internally it is whitish. It is glabrous in the mature fruits, thin and brittle, not splitting

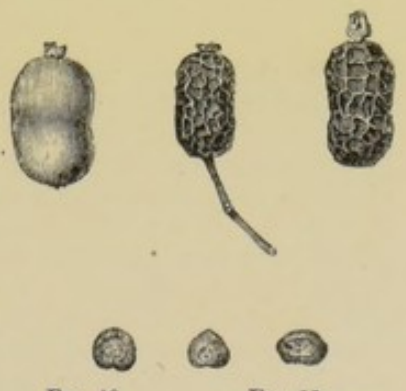


FIG. 10. FIG. 11.
Galanga Cardamom (fruits and seeds).

1855.

Galanga Cardamom.

into valves; in the shrivelled fruits it appears stronger, from its close adherence to the mass of seeds. Upon removal of the pericarp the seeds are seen united in a three-lobed mass, completely invested in a whitish integument, each cell or lobe containing, usually, two seeds, placed one above the other. The seeds are ash-coloured, flattish and somewhat three-cornered; finely striated externally towards a large conspicuous *hilum* which faces the wall of the capsule, and which is connected with the axillary placenta by a long, broad *funiculus*. Each seed is nearly surrounded by a tough aril; opposite the *hilum* a scar-like depression is observable. The seeds have a pungent, burning taste and aroma resembling the *Larger Galangal Root*; the pericarp is similarly aromatic and biting.

Referred to the Great Galangal.

Although I have not data for determining *with certainty* from what plant the *Galanga Cardamom* is derived, I am induced, after a careful examination, to refer it to the Great Galangal, *Alpinia Galanga*, Willd. (*Amomum Galanga*, Loureiro; *Lancquas*, Rumphius.) I do so, because—1. The name *Kaou-leang-keang*[1] (*Cảo Leâm Kiām* of Loureiro) or *Leang-keang* is the Chinese name of *Alpinia Galanga*. 2. The fruit in question substantially agrees with the descriptions of Rumphius,[2] Loureiro,[3] and especially of Roxburgh.[4]

I have examined several specimens of *Alpinia Galanga* in the herbarium of Sir W. J. Hooker; none, however, in fruit. The figures of the plant, also, with the exception of a very poor

[1] The syllable *tsze* merely signifies *seed* or *fruit*.

[2] *Herbarium Amboinense*, lib. 8, c. 9, p. 144.

[3] *Flora Cochinchinensis* (ed. Willd.), t. i., p. 7. I am aware that Loureiro here describes the fruit as *trivalvis*, but in an earlier description of *Amomum Galanga*, communicated by Loureiro himself to Sir Joseph Banks, this word is omitted. It was with much interest that I discovered this description of *A. Galanga* in a little MS. volume in the handwriting of Loureiro, preserved in the British Museum. The volume, which is the MS. No. 93, *Catal. Biblioth.*, tome iii., p. 35, is thus entitled:—*Nova Genera Plantarum in Cochinchinâ sponte nascentia descripta juxta methodum clar. Linnæi; simulque cum veris plantis missa in Angliam a Botanophilo Joanne de Loureyro. An.* 1773. The specimen of *A. Galanga* is unfortunately not now to be found.

[4] *Asiatick Researches*, vol. xi. (1810), p. 318. *Flora Indica* (ed. Carey) vol. i., p. 59, 61.

1855.

one in the *Herbarium Amboinense*, do not represent the fruit.[1]

It is from *A. Galanga* that the *Greater* or *Java Galangal* root is derived. It still remains to be ascertained to what plant we owe the *Smaller* or *Chinese Galangal*, the ordinary *Radix Galangæ* of European druggists.[2] [*Alpinia officinarum*, Hance.]

According to Loureiro, the seeds of *Amomum Galanga* are calefacient, alterative, stomachic, sternutatory, beneficial in pituitous colic, diarrhœa, vomiting, and hiccough. The root, he states in the MS. before referred to, appears to be *Galangal*.

I have observed a specimen of the *Galanga Cardamom* in the cabinet of the Royal College of Physicians of London.

Round or cluster Cardamom.

There is yet another species of Cardamom abundant in the markets of the East, which though now seldom seen in Europe, except in cabinets of *Materia Medica*, is described by all the older, and by many of the modern, writers on pharmacology. I mean the *Round* or *Cluster Cardamom*, the fruit of *Amomum Cardamomum* of Linnæus, a plant occurring in Sumatra and other parts of the Archipelago as well as on the adjacent continent. Of this drug, Mr. Padday has kindly sent me three samples obtained at Bangkok by Mr. Hunter. The finest sample, marked No 1, is the produce of Cambodia, and worth in Siam about 5*s.* sterling per lb. Samples No 2 and 3 are from Chantibon (Siam), and marked respectively 4*s.* 6*d.* and 2*s.* 3*d.* per lb. Mr. Hunter states that this Cardamom grows without cultivation on the lower slopes of the mountains.

Specimens from Cambodia and Chantibon.

The *Round* or *Cluster Cardamom* is in common use in China, whence I have repeatedly received it under various designations, as *Hang-kow*, *Seaon-kow*, *Po-tow-kow*; for the last name, which is perhaps the same as that quoted by Loureiro, the characters are 坡荳蔻

[1] Nees v. Esenbeck. *Plant. Med.*, pl. 67, 68. There is also a beautiful coloured drawing, marked *Amomum Galanga*, No. 1302 (unfortunately not representing the fruit), among the unpublished drawings of Dr. Roxburgh, in the possession of the Hon. E. I. Company.

[2] Consult Hanbury's subsequent paper on Galanga, *Pharm. Journ.* vol. ii. (1871), p. 248.

1863.

ON SOME NEW SPECIES OF *AMOMUM* FROM WEST AFRICA.

By Professor Oliver and Daniel Hanbury.

(*Read before the Linnean Society, April* 16, 1863.)

We have in preparation a monograph of the West African species of *Amomum*; but as there are yet some points to be cleared up, requiring further communication with residents at Sierra Leone and the ports of Liberia and of the Gulf of Guinea, we shall not be in a position to complete it during the present session of the Linnean Society. It appears, however, to be desirable that brief diagnoses of the new species should at once be laid before the Society, and we have accordingly prepared the following.

Specimens of all the plants described have been received, both in the dried state and preserved in fluid, accompanied in most cases by coloured sketches, from Mr. Gustav Mann, the able and persevering botanical collector to the Royal Gardens, Kew. In the Museum and Herbarium of this establishment the authentic specimens are deposited.

Mr. Gustav Mann.

Amomum, *L.*

* *Scapi uniflori. Semina ellipsoidea, nitida.*

Amoma [Species novæ].

1. A. Arundinaceum, sp. nov. Foliis lineari-lanceolatis, glabris, subsessilibus, scapis gracilibus 2-3 unc. longis, bracteis brevissime apiculatis, labello erecto rotundato-obovato, fructulate ovoideo nudo vel subnudo.

Hab. Corisco Bay, 1862, *G. Mann.*

** *Flores* 2-10 *congesti, in scapis simplicibus aut distiche ramosis.*

a. Labellum erectum, amplum, roseum v. purpureum. Folia glabra.

† *Scapi* 1-2-*pedalis, distiche ramosi.*

2. A. Giganteum, sp. nov. Foliis amplis, elongatis, lanceolato-oblongis oblanceolatisve petiolatis, scapi ramulis sæpius bifloris

antheræ crista lobo centrali producto quadrato-oblongo bifido v. subintegro, fructu ovali-lanceolato, seminibus ellipsoideis nitidis.

Hab. Gaboon River, 1861, *G. Mann.*

†† *Scapi simplices, aut breves basi ramosi.*

3. A. Sceptrum, sp. nov. Foliis auguste oblongo-lanceolatis, petiolatis, ligula scariosa, scapis simplicibus apice clavato-turgidis circa 10-floris, bracteis superioribus dorso apiculatis, tempore florifero transverse plicatis, fructu ovoideo-compresso v. subtrigono glabro, pericarpio crasso, seminibus angulatis.

Hab. Gaboon River, 1861, *G. Mann.*

4. A. Mannii, sp nov. Foliis oblanceolatis ellipticisve abrupte acuminatis, petiolatis, scapis 2-3 unc., 3-2-floris, bracteis brevissime apiculatis v. muticis, labello late obovato-rotundato.

Hab. Corisco Bay, 1862, *G. Mann.*

b. Labellum erectum, amplum, roseum v. purpureum. Foliis subtus minute pubescentia v. margine breviter pilosa. Staminodia libera.

5. A. Subsericeum, sp. nov. Foliis lanceolatis acuminatis, brevi-petiolatis, subtus pubescentia venulis transverse intertexta subsericeis, scapis brevibus sæpius bifloris, fructu ovato-lanceolato v. ovoideo, seminibus ellipsoideis nitidis.

Hab. Gaboon River and Corisco Bay, 1862, *G. Mann.*

6. A. Limbatum, sp. nov. Foliis oblongo-lanceolatis, acumine tenuiter caudatis, brevissime petiolatis v. sessilibus, subtus nervo medio atque margine brevissime ferrugineo pilosis, scapis brevibus 3-floris, fructu ovoideo seminibus ellipsoideis nitidis.

Hab. Fernando Po, 1859 and 1861, *G. Mann.*

c. Flores parvi, lutei. Folia pilosa. Staminodia coadunata.

7. A. Pilosum sp. nov. Foliis elongato-lanceolatis acuminatis, breviter petiolatis, sparse pilosis, scapis brevibus bifloris, labello limbo transverse elliptico subcordato v. fere integro, fructu parvo obovoideo in tubo persistente perianthii repente contracto seminibus perparvis transverse rugulosis.

Hab. Fernando Po, 1862, *G. Mann.*

1863. **** Scapi breves, obconici, capitati,* 10-15-*flori. Folia glabra.*

8. A. Citratum, *Pereira, Pharm. Journ. and Trans.* ix. 313.[1] Foliis elongatis, oblongo- v. obovato-lanceolatis, breviter acuminatis, petiolatis, scapis crassis, bracteis superioribus margine crispatis, labello amplo erecto, fructu obovoideo limbo lato perianthii persistente continuo coronato, seminibus obscure angulatis tuberculatisque, apice breviter conico productis.

Hab. Gaboon River.

NOTE ON *AMOMUM ANGUSTIFOLIUM*, SONNERAT.

1872.

(*Read before the Linnean Society, December* 7, 1871.)

Fruits. THE fruits which I now lay before the Society are those of *Amomum angustifolium*, Sonnerat, ripened in my hot-house at Clapham during the past autumn.

Sonnerat. This species of *Amomum* was collected by Sonnerat in Madagascar, and described and figured in his *Voyage aux Indes Orientales et à la Chine*, published in 1782. It was cultivated in the Calcutta Botanical Garden by Roxburgh, who states that plants of it were brought thither from Mauritius in 1802. An excellent coloured drawing is in the Roxburgh Collection now at Kew.

Bojer, in his *Hortus Mauritianus* published in 1837, mentions, as occurring in Mauritius, a plant which he calls *Amomum nemorosum* or *Longouze*. That this is the same species as the *A. angustifolium* of Sonnerat, I have ascertained by means of a good suite of specimens and coloured drawings transmitted to me several years ago by M. Emile Fleurot, of that island. Bouton, in his *Medicinal Plants of Mauritius* (1857), assigns to the *Longouze* its correct name of *Amomum angustifolium*, Sonnerat. He asserts that it was brought originally from Madagascar; but in a letter to me under date May 6, 1861, he remarks that it "is positively a native of Mauritius, where it grows abundantly in marshy places."

Longouze.

My plant was raised from seeds sent from Mauritius to the

[1] As no description of this species has yet been published, we include its diagnosis in the present paper.

Paris Exhibition of 1867. When it flowered, in June last, I was instantly struck with its perfect resemblance to the West-African *A. Danielli*, Hook. f.; and a careful comparison convinced me of the identity of the two species. 1872. Resemblance to *A. Danielli*.

Of the West-African plant I have specimens from Sierra Leone, Monrovia, Grand Bassa, Cape Palmas, Akassa, Old Calabar, the islands of Fernando Po and St Thomas, and the river Gaboon. It varies in the colour of the flower, which is sometimes of a uniform chrome-yellow, sometimes crimson, with the labellum of a yellow more or less pale, and sometimes, again, entirely crimson; but the shape of the flower, which is highly characteristic, presents but little variation. The scape is either short or long (that is, from three to eight inches, or more), and varies greatly in the number of fruits which it bears. The fruits are moderately uniform in shape and size; they are filled with an acidulous pulp, in which are lodged numerous oblong polished brown seeds. Neither the fruit, nor foliage, nor the two combined afford positive characters for recognition of the species: Description of the West African plant.

The synonymy of the plant may be given thus:— Synonyms.

Amomum angustifolium, Sonnerat, *Voyage aux Indes Orientales et à la Chine*, ii. 242, tab. 137; Roxburgh, *Flora Ind.*, ed. Carey, i. 39.

A. nemorosum, Bojer, *Hort. Mauritianus* (1837), p. 327.

A. Danielli, Hook. f., Hooker's *Journ. of Bot.* iv. (1852) 129, tab. 5 (sub. nom. A. Afzelii); *Bot. Mag.* tab. 4764.

A. Clusii (? Smith in *Ree's Cyclopædia* (*Addenda*), xxxix.); *Bot. Mag.* tab. 5250.

THE MADAGASCAR CARDAMOM, OR LONGOUZE.[1]

(*Longouze, Madagascar-Cardamomen, von Amomum angustifolium, Sonnerat.*)

1872.

In several works on Materia Medica published within the last fifty years,[2] mention is made of a *Madagascar Cardamom*

[1] Read at the Evening Meeting of the Pharmaceutical Society of Great Britain, February 7, 1872.

[2] Fée, *Cours d'Hist. Nat. Pharmaceutique*, I. (1828) 361; Guibourt, *Hist. des Drog.* II. (1849) 216; Martiny, *Encyklopädie d. Med. u. pharm.*

1872.

Names.

the fruit of a zingiberaceous plant called *Amomum angustifolium*. Sonnerat, the author of this botanical name, was a French traveller who visited Madagascar in the second half of the last century. Among the plants of that island which he described[1] was the species in question, which he thought he identified with the *Great Cardamom* of ancient writers, a drug we now know to have a very different origin. The name *Grand Cardamome* had, however, been given to it more than a century before by Flacourt,[2] another explorer of Madagascar. Both Flacourt and

Longouze.

Sonnerat state that the plant is known as *Longouze*, and the latter adds that it has been introduced into the Isle of France where it thrives well. The fruit is described as of a scarlet colour, filled with a white pulp of pleasant acidulous taste, in which are imbedded numerous, spicy, brown seeds. The plant is said to grow in great plenty in marshy places, but no mention is made of the fruits being ever collected for the purposes of commerce.

In 1854, Mr. Emile Fleurot of Mauritius, contributed to the Museum of the Pharmaceutical Society specimens and drawings of the *Longouze* which is now apparently wild in that island. They were labelled, in accordance with Bojer's *Hortus Mauritianus*,[3] *Amomum nemorosum*, under which name they were not recognised as Sonnerat's plant. It appears, however, that this *A. nemorosum* Bojer is but a synonym of *A. angustifolium*, Sonn., with which in fact the specimens communicated by Mr. Fleurot entirely agree. The plant is still claimed in Mauritius to be the *Grand Cardamome de Madagascar*.[4]

Drugs from Mauritius.

A collection of Mauritius drugs sent to the Paris Exhibition of 1867 included fruits of *Amomum angustifolium*, from which I obtained a few seeds that germinated. During the past summer (1871) one of the plants thus raised produced flowers,

Rohwaarenkunde, II. (1854) 771 ; Berg, *Pharm. Waarenkunde*, 1863, 425 ; Wiggers, *Handbuch d. Pharmacognosie*, 1864, 176 ; Henkel, *Handbuch d. Pharmacognosie*, 1862, 382.

[1] *Voyage aux Indes Orientales et à la Chine*, II. (1782) 242. pl. 137.

[2] *Hist. de la grande Isle de Madagascar*, Paris 1658, 126.

[3] Maurice, 1837, p. 327.

[4] Bouton, *Medicinal Plants growing * * in Mauritius*, 1857, p. 152.

1872.

which having been fertilized artificially, were succeeded by ripe fruits.

Now a most interesting point about this plant is its complete identity with a species of *Amomum* growing in Tropical western Africa. Though Mr. Fleurot's excellent drawings might well have raised suspicions that such was the fact, it was not until my plant flowered that I convinced myself that the *Amomum Danielli* of Hooker could in no way be distinguished from the *A. angustifolium* of Sonnerat. *A. Danielli*, Hook. f., has been figured three times in the last twenty years,[1] yet its similarity to the Madagascar plant has not been noticed, although of the latter there is in addition to Sonnerat's plate, an excellent drawing in Roxburgh's unpublished collection, now in the herbarium of the Royal Gardens, Kew.

Identity of *A. angustifolium* with A. *Danielli*.

The West African area of the plant extends along the coast line from Sierra Leone to Gaboon, and perhaps still further south. Growing over this wide district and under considerable variation of altitude, the plant presents some variations; the flower is either yellow or red, or has the labellum alone, yellow. The scape is simple or branched, short or long, and varies in the number of fruits it bears; and the fruits themselves differ much in size according to locality. But the labellum is always narrow and pendulous, and the seeds oblong and highly polished. The negroes of West Africa eat the pleasantly acidulous pulp of the fruit, and apparently do not use the seeds, but in Mauritius according to Bouton, the latter are chewed to sweeten the breath.

W. Africa.

I have no reason for believing that the fruits of *Amomum angustifolium*, Sonn., have ever been even an *occasional* article of export, either from Eastern or Western Africa, and feel quite certain that they never formed a regular object of commerce with Europe. The seeds are weak in aroma and have a disagreeable irritating taste, so that they could with no advantage replace the Cardamoms of Malabar or Ceylon.—[N. Repert. f. Pharm. xxi. 228.]

[1] Hooker's *Journ. of Bot.* IV. (1852) pl. V. sub nom. *Amomum Afzelii*, *Bot. Mag.* tabb. 4764, 5250.

1855.

TRAGACANTH AND ITS ADULTERATIONS.

(*Note on a Paper by Mr. Sidney H. Maltass.*)

THE author having had the kindness to forward a series of samples illustrative of the above notice, it may not be uninteresting here to enumerate them :—

Illustrative Samples of Tragaca th.

Superior Qualities.

1. White picked Yalavatz gum tragacanth.
2. ———————— Caissar gum tragacanth.
3. French assorted *leaf*—sample of seven cases.
4. Broken *leaf* picked by women, mixed with fine *leaf*.
5. Broken *leaf* of Caissar gum, mixed with fine *leaf*.
6. Vermicelli as picked out before mixing with *Sesame*.
7. Vermicelli—sample of one case.
8. Very small *leaf*, termed *Sesame*, mixed with *Vermicelli*.

Inferior Qualities.

9. Common *leaf* mixed with *English assortment*.
10. English assorted *leaf*—sample of four cases.
11. Common or sorts—sample of two cases.
12. Small refuse, thrown out—almost worthless.
13. Large refuse gum—almost worthless.

Gums used for the Adulteration of Tragacanth.

14. Moussul gum.
15. Caramania gum, first quality, worth £2 10*s*. per cwt., to be mixed when broken up and whitened, with fine *leaf* and *Vermicelli*.
16. Caramania gum, second quality, worth £1 10*s*. per cwt. to be mixed when broken up and whitened, with *sorts* gum.
17. Caramania gum, broken into fragments, and whitened with white lead, for mixture with *English assorted leaf*, in the proportion of 50 per cent.
18. Caramania gum in smaller fragments, whitened with white lead for mixture with *Vermicelli*, in the proportion of 50 per cent.

19. Caramania gum, whitened with white lead, for mixture with *sorts* and common gum, in the proportion of 100 per cent. 1855.

The substances designated *Moussul Gum* and *Caramania Gum* belong to the somewhat ill-defined group described by pharmacologists as *Bassora Gum*, *Kutera Gum*, and *False Tragacanth*.

In a small but interesting collection of gums and gum-resins formed in Persia by W. K. Loftus, Esq., and deposited partly in the British Museum, and partly in the Museum of the Royal Gardens at Kew, is a specimen of our *Moussul Gum*, stated to be the "common *Ketìra* of the Arabs, exuded from the *Gawan* or *Gabban* of Persia." Is this plant the *Cochlospermum Gossypium*, De C.? Persian gums and gum-resins.

The *Caramania Gum* appears identical with the *Gomme pseudo-adragante* of M. Guibourt, regarded by that author as the produce of *Astragalus gummifer*, Labill.

Further researches, however, are much required to determine botanically the origin of these substances.

The practice of whitening gum with carbonate of lead is deserving of attention. Mr. Maltass was informed upon his first inquiries on the subject, that the whitening was effected by starch; this, however, proved untrue, and it was afterwards reluctantly admitted that white lead was employed. Lead carbonate an adulterant.

I can fully confirm the existence of carbonate of lead in the samples No. 17, 18, and 19; and can also state that I have readily detected lead in the adulterated *Small Tragacanth* imported into the London market.

The gum used in adulterating tragacanth can readily be recognized upon careful inspection.

ON *WOOD OIL*, A SUBSTITUTE FOR COPAIBA.

(*Gurjun-Balsam*, *N. Repert. f. Pharm.* v. 95.)

1856.

Among the drugs that have recently appeared in the London market, I have observed one article to which I am desirous of drawing attention. It is a liquid imported in considerable quantity from Moulmein in Burmah, and offered for sale under

1856. the name of *Balsam Capivi*, but known in India as *Wood Oil*, or *Gurjun Balsam*.

To Balsam of Copaiba, however, it presents so remarkable a resemblance, that, but for the locality from which it was imported, it would hardly have been noticed as anything else than Copaiba of rather unusually dark colour.

Wood Oil. In the Paris Universal Exhibition there are two samples of a similar liquid, labelled *Wood Oil*, one of them being sent among the Materia Medica of Canara, the other from the Tenasserim provinces. Through the kindness of Dr. Royle, specimens of each have been placed at my disposal. Though comparatively a new drug in English trade, *Wood Oil* is an article of common occurrence in the bazaars of India.

From its similarity to Copaiba, it might be supposed to have its origin in some plant nearly allied to *Copaifera*: such, however, is not the case, it being the produce of the natural order *Dipterocarpeæ*.

Mode of obtaining the balsam. The following is Roxburgh's account of the manner of obtaining it from *Dipterocarpus turbinatus*, an immense tree, native of Chittagong, Tipperah, Pegu, and other places to the eastward of Bengal.[1]

"This tree is famous over all the Eastern parts of India and the Malay Islands, on account of its yielding a thin liquid balsam, commonly called *Wood Oil*, which is much used for painting ships and houses.

"To procure the balsam, a large notch is cut into the trunk of the tree, near the earth (say about 30 inches from the ground), where a fire is kept up until the wood is charred, soon after which the liquid begins to ooze out. A small gutter is cut in the wood to conduct the liquid into a vessel placed to receive it. The average produce of the best trees during the season, is said to be sometimes 40 gallons. It is found necessary, every 3 or 4 weeks, to cut off the old charred surfaces and burn it afresh; in large healthy trees abounding in balsam, they even cut a second notch in some other part of the tree, and char it as the first.

"These operations are performed during the months of November, December, January, and February. Should any of the

[1] *Flora Indica* (ed. Carey), vol. ii. p. 613.

1856.

trees appear sickly the following season, one or more years' respite is given them."

The same author also states that Wood Oil is afforded by *D. costatus* (*D. angustifolius*, W. et A.), *D. alatus*, Roxb., and *D. incanus*, Roxb., the last mentioned being reputed to furnish the largest proportion of the best sort.

Camphor Oil.

Closely allied to the Wood Oil of *Dipterocarpus* is the oleo-resin termed *Camphor Oil*, produced by *Dryobalanops Camphora*, Colebr., a tree of the same natural order. For a specimen of this oleo-resin and of an analogous liquid called *Lagam Oil*, both brought from Sumatra by Dr. Junghuhn, I am indebted to the courtesy of Dr. J. E. De Vrij, of Rotterdam.

Characteristics of Wood oil.

Wood Oil, as imported from Moulmein, is, after filtration, a transparent, dark-brown liquid, of somewhat greater consistence than Olive Oil, a sp. gr. of ·964, and an odour and taste like copaiba, though perhaps hardly so strong. One part of it treated with two parts of alcohol, sp. gr. ·796, is dissolved with the exception of a minute quantity of darkish flocculent matter, which subsides upon repose.

Solidification.

But its most curious property (as noticed by Mr. Charles Lowe with reference to a liquid which I suppose to have been *Wood Oil*[1]) is that exhibited when it is heated in a *corked* vial to about 266° F. (130° C.). Thus treated it becomes slightly turbid, and so gelatinous that the vial may be inverted, even while hot, without its contents being displaced; and on cooling, the solidification is still more complete. Gentle warmth and agitation restore to a great extent its fluidity, but solidification is again produced upon the liquid being heated to 266°.[2] Copaiba displays no such phenomenon.

According to Dr. O'Shaughnessy, when Wood Oil is heated in a retort, a yellowish white, *crystallizable*, solid substance having many of the properties of benzoic acid sublimes into the upper part of the vessel, to the extent of about one per cent. of

[1] On a new variety of Balsam of Copaiba, *Pharmaceutical Journal*, vol. xiv. pp. 65, 66.

[2] Mr. Lowe says 230° F., but a much more striking effect is produced on the *Wood Oil* by the temperature I have named.

1856. the Wood Oil taken. In my own experiments, I have not detected any of this substance. It is true that when Wood Oil is heated, a scanty, opaque white sublimate condenses in the cooler part of the vessel, but this appears to arise from the condensation of a little water among the minute drops of essential oil, since it is not produced if the Wood Oil has been previously agitated with some fragments of dried chloride of calcium.

Medical Use. With regard to its medicinal properties, there appears to be no doubt from an extensive set of experiments instituted by Dr. O'Shaughnessy, confirmed by trials made by other practitioners in India, that Wood Oil is nearly equally efficient with Copaiba, in the diseases in which that drug is indicated.[1] It may be administered as an emulsion, or in pills made up with magnesia. Dr. O'Shaughnessy has used the essential oil in doses of from 10 to 30 drops.

From the close similarity of Wood Oil to Copaiba, a mixture of the two may be anticipated; from pure Copaiba, such a mixture will probably be detected by a difference in its optical properties.

ON *PENGHAWAR DJAMBI*, A NEW STYPTIC.

1856. A SMALL package of the curious drug known by the name *Penghawar Djambi*, or by the not less barbarous designation *Pakoe Kidang*, was lately offered at one of the public drug sales in the City.

Description. The drug consists of the lower part of the stalk or *stipes* of a large fern, native of the island of Sumatra. The stalks as imported are in straight pieces, about a foot in length and an inch in width. They have mostly been split open lengthwise, perhaps to facilitate their drying. Their most striking feature, however, is the abundant clothing of long, sparkling, golden-brown, moniliform hairs, with which the outer part of the stipes is thickly covered, and which at the first glance suggest for the drug an animal rather than a vegetable origin.

Penghawar Djambi, though new to the English drug-market,

[1] *Bengal Dispensatory* (1842), pp. 222—224.

1856.

has for some years past been in the hands of the pharmacists of Holland and Germany, and now has even a place in the Dutch pharmacopœia.[1]

Plant yielding the styptic.

The plant which affords it is without doubt of the genus *Cibotium*. Dr. Oudemans, in his Commentaries on the *Pharmacopœa Neerlandica*,[2] refers it to *C. Cumingii* Kunze, a fern of the Philippine Islands, regarded by one of our best filicologists as not specifically distinct from the *C. Barometz* of J. Smith. On this point Mr. John Smith has been kind enough to reply to some inquiries I recently addressed to him, in a communication from which I extract the following:—

Mr. John Smith.

"I may safely say that the hairy stipes called *Penghawar Jambi* are produced by a species of *Cibotium*. Of this genus, six species are described in Sir W. Hooker's *Species Filicum*,[3] viz., *C. glaucescens*, Kze. (*Polypodium Barometz*, L., *Cibotium Barometz*, J. Sm.) and *C. Assamicum*, Hook., from the Eastern hemisphere; *C. Schiedei*, Schlecht. et Cham., from Mexico; and *C. glaucum* (*Dicksonia glauca*, Smith in *Ree's Cyclop.*), *C. Chamissoi*, Kaulf. and *C. Menziesii*, Hook., from the Sandwich Islands. All are characterised by having the rhizome or caudex and the base of the stipes densely covered with soft moniliform hairs. In the Eastern species, the rhizome is decumbent, and upon removal from the ground, might easily be formed by a little artful manipulation into the fabulous *Vegetable Lamb* or *Barometz*. The plant which affords its production was referred by Linnæus, from Loureiro's description,[4] to the genus *Polypodium*, and called *P. Barometz*. Nothing further was known of it till about thirty years ago, when the late John Reeves, Esq., sent a living plant from China to the nursery of Messrs. Loddiges at Hackney, as the true *Barometz*. This plant increased and in time became an inhabitant of other gardens; it was not, however, till 1840 that it produced fructification, which it did in the Birmingham Botanic Garden, a notice of which is recorded in the *Proceedings of the Linnean Society* for February 1840. I then identified it as belonging to the genus *Cibotium*

[1] *Pharmacopœa Neerlandica*, 1851, p. 53.

[2] *Aanteekeningen op het Botanische, Zoologische en Pharmacognostische Gedeelte der Pharmacopœa Neerlandica.* Door C. A. J. A. Oudemans, M.D., Rotterdam, 1854, 1. Afl. p. 17.

[3] Page 82.

[4] *Flora Cochinchinensis.* Ed. Willd., p. 829.

1856.

of Kaulfuss, and in my *Genera Filicum*, published in 1841, I recorded it under the name of *Cibotium Barometz*.

"In the Berlin Garden it received the name of *C. glaucophyllum*, afterwards changed to *C. glaucescens* by Kunze, who figured it in Schukhr's *Supplement*, p. 63, t. 31. Since then (1846) dried specimens collected both by Fortune and by Seemann, and corresponding with the living plant, have been received from China.

"Now for the name *Cibotium Cumingii*. In 1840, Cuming brought specimens of a *Cibotium* from the Philippines, which in my enumeration of the ferns of those islands I named *Cibotium glaucum*,[1] then believing it to be the *Dicksonia glauca* of Dr. J. E. Smith (Ree's *Cyclop.*, vol. xi.). Kunze, however, considered it a distinct species and named it *C. Cumingii*.

Cibotium Barometz.

"After much examination of well-authenticated specimens I have come to the conclusion that *C. Barometz*, J. Sm., *C. glaucescens*, Kunze, *C. Cumingii*, Kunze, and *C. Assamicum*, Hook., constitute *one* species only. I therefore retain the original historical name of *C. Barometz* for the eastern type of the genus.

"It appears that the stipes called *Penghawar Djambi* comes from Sumatra. Although I have not seen any fronds of *Cibotium* from that locality, still, judging from the stipes in question, I see no reason to doubt the correctness of referring it to *Cibotium Cumingii*, which, as above stated, I regard as not different from *C. Barometz*."

Agnus Scythicus.

The authors of the *Pharmacopoea Neerlandica* quote *Agnus Scythicus* as synonymous with the Sumatran *Penghawar Djambi*, in which it is evident Mr. John Smith thinks them correct. They do not, however, attempt to fix the botanical origin of the drug, but merely refer it to "Filicis species nondum satis cognita."

Professor Miquel, on the other hand, while referring *Penghawar* to *C. Cumingii*, Kunze, questions its identity with *Agnus Scythicus* in these words:—"*Agnus Scythicus* seu *Barometz pharm.*, filicis etiam caudex est sed ab eo Cibotiorum diversus."[2]

[1] *Journ. of Bot.*, vol. iii. (1841), p. 418.
[2] *Analecta Botanica Indica*, ii., 36.

1856.

Having examined an ancient specimen of the so-called *Scythian Lamb* preserved in the British Museum,[1] as well as a living plant of *Cibotium Barometz*, J. Sm., I must confess I find them far more to resemble each other than they do the Sumatran *Penghawar*. It must, however, be borne in mind that a plant having a range so extensive as to embrace Assam, China, the Philippines and the Islands of the Indian Archipelago, may be expected to vary considerably according to the soil, the situation, and the degree of moisture and heat in which it may grow, so that I am far from impugning the correctness of referring both productions to one and the same plant.

Fable of the Scythian Lamb.

As I have alluded to the fable of the Scythian Lamb, and it may not be familiar to all readers, I may be allowed briefly to recall it, although to cite one half of the old authors of the sixteenth and seventeenth centuries, who have delighted to tell of its wonders, would be neither an easy nor a very profitable task.

Barometz.

Suffice it, then, to say that *Agnus Scythicus*, *Frutex Tartareus*, or *Vegetable Lamb* was regarded as a sort of *plant-animal*, resembling in figure a *lamb*, whence its Russian name *barometz*. It was said to spring from a seed like a plant, and to be attached to the earth by a root, while in its animal nature it rejoiced in a sort of flesh and blood, browsed upon the surrounding herbs by turning round upon its axis or root, until, having devoured all within reach, it perished a victim to hunger!

Poetry and Materia Medica are not now-a-days in close alliance, but such was not the case in the beginning of the seventeenth century; and the author who could write an ode on Tacamahaca, Tamarinds, or Cochineal, could have no difficulty in producing a sonnet on so much more poetic a theme as the Scythian lamb.

The vegetable lamb.

Guillaume Saluste, Sieur du Bartas, represents the astonishment of our first parents at discovering in the garden of Eden

[1] Probably the same specimen as is excellently figured in Rymsdyk's *Museum Britannicum*, Lond., 1791, fol. Tab. xv., fig. 2.

1856.

Guillaume Saluste, Sieur de Bartas.

so remarkable a production as a *vegetable lamb*, and then exclaims with pious credulity :—

"O merveilleux effect de la dextre divine,
La plante a chair et sang, l'animal a racine,
La plante comme en rond, de soy mesmes se meust,
L'animal a des pieds, et si marcher ne peut,
La plante est sans rameaux, sans fruict et sans feuillage,
La plante a belles dents, paist son ventre affamé
Du fourrage voysin, l'animal est semé."[1]

The fable is revived in the following more elegant lines from the pen of a modern author, but they are not very happy as applied to a *Sumatran* plant :—

"Cradled in snow and fann'd by arctic air,
Shines, gentle Barometz! thy golden hair;
Rooted in earth each cloven hoof descends,
And round and round her flexile neck she bends;
Crops the grey coral moss and hoary thyme,
Or laps with rosy tongue the melting rime.
Eyes with mute tenderness her distant dam,
Or seems to bleat, a *Vegetable Lamb*."[2]

Uses, surgical and medicinal.

Before dismissing *Penghawar Djambi*, we must, however, consider its reputed medicinal and surgical uses. As a styptic, the hair of the stipes may be employed in the same manner as cotton wool, tow, or the nap of a beaver hat. According to Dr. J. M. Van Bemmelen, who has elaborately investigated the chemistry of the drug,[3] the styptic action of these hairs is solely mechanical. Practitioners, however, have tried the effect of an aqueous decoction of the hairs or of the stem, as a remedy for internal hemorrhage,[4] and some have reported favourably

[1] See the French translation of Clusius's Latin version of *Monardes*, by Anthoine Colin, Maistre Apoticaire, juré de la ville de Lyon ; Ed. 2. Lyon, 1619, 8vo., where are preserved some other of these effusions "à la louange de quelques drogues."

[2] *The Botanic Garden*, ed. 3, pt. II., p. 30.

[3] *Chemische Untersuchung des Penghawar Djambi* in *Vierteljahresschrift für prakt. Pharmacie*, V. bd., 3 heft (1856).

[4] Since the above was in type, I have heard from my friend, Dr. J. E. De Vry, of Rotterdam, that the late Dr. Molkenboer, a talented Dutch physician, was firmly of the opinion that a decoction of *Penghawar Djambi* was beneficial in internal hemorrhage.

of it. The experiments of Dr. Van Bemmelen leave little ground for placing any reliance on the reputed good effects of the drug so applied; and I fully concur in that writer's conclusions as expressed in terms which I translate thus:— 1856.

"I therefore believe myself justified in the opinion that it is highly improbable that that which water extracts from this plant is an active remedy for internal hemorrhages. There appears to me no ground whatever, either from a chemical or physiological point of view, for presuming that we may expect any good result in practice from the employment of such a preparation."

NOTE UPON A GREEN DYE FROM CHINA.

(*Grüner Farbstoff aus China.*)

1856.

Some weeks since a merchant showed me a small sample of a new dye, said to have been imported into Marseilles from China, and to be recommended for dyeing silk. From its dark blue colour I conjectured it might be a sort of indigo, such as the Chinese are stated to prepare from *Isatis tinctoria*, L., and from *Polygonum tinctorium*, Lour., but I had no opportunity of determining whether it was indigo, by any chemical examination.

Very recently, however, a larger sample of the same dye and a piece of cotton cloth dyed green with it, have been sent to me by my friend William Lockhart, Esq., of Shanghai. They were accompanied by a communication as to the manufacture of the dye upon the authority of the Rev. J. Edkins, the substance of which is given below.

I may add that Mr. Lockhart forwarded to me in the early part of this year stems of the cultivated tree called *Lŭh-chae*, being one of those from whose bark the dye is manufactured, but no specimens from which its botanical characters could be ascertained.

The Dye *Lŭh-kaou.*

The dye, which is known as a *green* dye, and called *Lŭh-kaou*, consists of a dry paste, in small irregular fragments scarcely thicker than stout paper. Its colour is an intense blue-black, with a little of the coppery lustre seen upon indigo. Rubbed upon paper with a moistened ivory knife, it develops a greenish-

1856.

blue of considerable brilliancy. It is insoluble in water, rectified spirit, or ether, whether cold or hot. With fixed alkalis, however, a solution of an intense green colour is obtained. A solution prepared by boiling ten parts of the dye with three parts of carbonate of potash (KO, CO_2) has a brilliant bluish-green, and possesses the following characters. The addition of an acid occasions no precipitate. Solution of hypochlorite of soda (*Liquor sodæ chlorinatæ*, P. L.), very sparingly added, changes the green to blue, which speedily passes to purple and then to pink; a large addition of the reagent destroying the colour completely. Solution of iodine produces the same changes from green to pink. Sulphurous acid alters the green to a yellowish-brown. Hydrochloric acid occasions no change in a solution of the dye; nitric acid renders it brown.

Chemical Characters.

This brief and superficial examination is almost all that my small stock of the dye has permitted, but upon the arrival of a larger quantity, I trust a complete investigation will be made.

The following is the substance of the information before alluded to, as obtained by the Rev. J. Edkins.

Rev. J. Edkins.

The bark of two kinds of the tree called 綠柴 *Lŭh-chae*, literally *Green-shrub*, one kind growing wild, which is known as the *white*, and another, which is cultivated, and called the *yellow*, are used to obtain the dye. The *white*, or wild *Lŭh-chae*, grows abundantly in the neighbourhood of Kea-hing and Ningpo. The *yellow* is produced at Tsŏh-kow-pang, where about thirty men are employed in the manufacture of the dye. This place is two or three miles west of Wang-teen, a town a few miles to the south of Kea-hing. The dye is also prepared in Hoonan and at Ningpo, but not so good.

The process is as follows:—The two barks are placed together in iron pans and thoroughly boiled in water. The decoction is left undisturbed for three days, after which it is placed in large earthenware vessels, and cotton cloth prepared with lime is dyed with it several times. After five or six immersions, the colouring matter is washed from the cloth with water, and

Process of extraction.

placed in iron pans to be again boiled. The colouring matter is taken up on cotton yarn [by dipping] several times in succession; it is then washed off and sprinkled on thin paper; when half dry, the paper is pasted on light screens and thoroughly exposed to the sun. The product is called in Chinese *Lŭh-kaou*. In dying cotton cloth with it, ten parts are mixed with three parts of subcarbonate of potash in boiling water. 1856.

It is not used to dye silk on account of the expense, since it is only a rough surface that takes it easily, and to colour silk so much of the material must be used, that it would not pay. All cotton fabrics, also grass-cloths, take the colour readily. The dye does not fade with washing, which gives it a superiority over other greens. It has long been used by painters in water-colours, but the application of it to dye cloth was first made only twenty years ago. If some method could be discovered of applying it to silk fabrics, it would become still more useful. An unfading green.

The dye is sent from Kea-hing as far as Shantung.

ON STORAX BARK.

(*Storaxrinde.*)

Among the drugs formerly imported from the Levant is one now of rare occurrence, known in works on Materia Medica as *Cortex Thymiamatis*, *Cortex Thuris*, *Thus Judæorum* or *Nascaphtum*, and also by the names *Styrax rubra* or *Storax Bark*. Nothing satisfactory as to its origin has yet been ascertained: by some authors it is supposed to be the produce of *Styrax officinale*, Linn., after the expression of the resin, as related by Landerer,[1] and when ground, to constitute the *Styrax calamita* of the shops. By other authors it has been referred to *Liquidambar orientale*, Mill., or even to the American *L. styraciflua*, Linn.[2] 1854. Botanical origin.

Be this as it may, the bark of *Styrax officinale*, as grown in France, is entirely dissimilar to the *Cortex Thymiamatis* of the

[1] Pereira, *Elem. of Mat. Med.*, ed. 3, vol. ii., p. 1515.
[2] P. L. Geiger, *Pharmacop. Univers.* Heidelberg, 1335, 8vo., p. 52.

1854. Levant. When at Toulon in the month of May last, I had the pleasure of visiting in company with M. Chambeiron, an intelligent *pharmacien* and botanist of that town, one of the few localities in France where this beautiful plant is indigenous. In the mountainous woods on the east side of Toulon, in the direction of Cuers, the *Styrax* abounds. As it is cut periodically for fuel in common with the other trees growing near it, it can seldom attain any very considerable size; I observed no tree, I should say, exceeding eight or nine feet in height. At the moment of my visit (17th May 1854) the *Styrax* trees were in full perfection, presenting with their abundance of orange-flower-like blossoms, a truly beautiful appearance. No trace of resinous exudation could I observe upon the trunk of any, nor did the fresh bark possess the least odour of storax. Of the bark, however, as the opportunity offered, I collected with the assistance of M. Chambeiron an abundant sample, taking it both from young and old wood. After it had been carefully dried by exposure to the air, it had assumed the form of tightly rolled quills; in this state it is externally smooth and of a dark greyish-brown, on its inner surface greenish; it is brittle, devoid of odour, and has a slightly bitter, non-aromatic, taste. No odour of storax could be perceived upon heating the bark over a lamp.

Styrax tree.

Bark of French *Styrax officinale.*

The bark of *Styrax officinale* grown in France, is therefore a very different thing from the so-called *Storax Bark* of the Levant. Whether the latter be really the produce of *Styrax officinale*, and the difference in the two be occasioned merely by climate, age of the trees, or other causes, further researches will, I trust, soon show. Landerer has asserted [1] that the Styrax tree, inodorous in Greece, becomes fragrant at Cos and Rhodes, affording in these islands the resin Storax which is thence exported. But at Rhodes, at least, the trade in it must be very small indeed, as Mr. Niven Kerr, for many years H.B.M. Consul in that island, recently assured me he was wholly ignorant of it.

[1] Pereira, *op. cit.*

ON STORAX. 1857.

"Verum ad accuratam ac diligentem Materiæ Medicæ tractationem instituendam, remedii cujusque historiam et virtutes à medicis recensitas exponere non sufficit; sed etiam multa insuper consideranda sunt ac perpendenda."—GEOFFROY, *Tract. de Mat. Med.*

Liquid and Solid Storax.

WRITERS on Materia Medica, ancient as well as modern, have generally concurred in applying the name *Storax* or *Styrax* to two distinct substances, namely *Liquid* and *Solid* Storax. I might almost say to two *groups* of substances, since each comprehends two or more varieties.[1]

The plant to which Storax, at least the solid kind, is commonly referred, is *Styrax officinale*, Linn., a small tree of the Nat. Ord. *Styraceæ*, occurring in Provence, Italy and the Levant. It is this tree, to which all authors admit, the account of Storax given by Dioscorides in the first century refers.[2] In fact, it is not unreasonable to suppose that a tree so nearly allied to that producing Benzoin, should be capable of affording an analogous product.

That it may under certain favourable circumstances exude a fragrant resin, even in France and Italy, we know from the positive testimony of two authors, the first of whom, Duhamel, has written in these words:

Duhamel.

"J'ai trouvé en Provence, près de la Chartreuse de Montrieu, sur de gros Aliboufiers, des écoulements assez considérables d'un baume très-odorant. Il n'est pas douteux, ce me semble, que ces Aliboufiers ne fournissent du Storax."[3]

[1] A conventional distinction of confining the name *Storax* to the *solid* drug and *Styrax* to the *liquid*, is adopted by some modern authors. But as such a use of terms leads to some inconsistency, I have not adopted it, but employ the word *Storax* as the English equivalent of the original Greek word Στύραξ.

[2] Perhaps I ought to except Professor Orphanides of Athens, who has hinted that the text of Dioscorides on the subject of Storax, requires correction. *Bulletin de la Société Botanique de France.* T. iij. p. 147.

[3] *Traité des Arbres.* Paris, 1755. 4to, t. ij. p. 289. Montrieu or Montrieux is a little place about 10 miles to the north of Toulon, in the department of the Var. In this neighbourhood the *Styrax* grows wild.

In order to endeavour to obtain an authentic specimen of the exudation of *Styrax officinale*, I wrote to my friend Dr. Planchon of Montpellier, who at my suggestion kindly caused incisions to be made during the hottest part of last summer, in the trunk and branches of a large and fine *Styrax* growing in

1857. *Styrax en larmes.*

The second author is the Abbé Mazeas, who, in a communication under date 18 Jan. 1769 addressed to the *Journal des Sçavans*,[1] states that on a plain in the neighbourhood of Tivoli, near Rome, sheltered on the N. and N.E. by a chain of mountains contiguous to Monte Genarro, Rocca Giovane, S. Polo &c. which form a semi-circle open to the south,—in fact, in a very warm situation, the *Styrax* shrub yields by incisions in its bark, the valued exudation known as *Styrax en larmes.*

As the account of Storax left us by Dioscorides who was a native of Cilicia, one of the countries affording the drug, is important, I will here give its literal translation, subjoining in a note the Latin text of Sprengel,[2] the latest commentator upon that author.

Account by Dioscorides [translation].

Storax is the exudation of a certain tree resembling a quince-tree. It is preferred yellow and shining, resinous, having whitish lumps, retaining for a long period a very grateful odour; when softened, it emits a certain honey-like humidity. Such is the Gabalite, the Pisidian and the Cilician [Storax]. That of bad quality is black, friable and branny. There is also found an exudation resembling gum, transparent, myrrh-like; but this is produced rarely. Storax is adulterated with the powder of the tree itself, made by the erosion of little worms, honey and the dregs of iris[3] and some other things, being added. There are

the Botanic Garden there. The experiment was quite unsuccessful: neither aqueous sap nor resinous juice flowed from the incisions.

[1] Vol. for 1769, p. 105.

[2] "Styrax lacrima est arboris cuiusdam cydoniæ similis. Præfertur flavus ac pinguis, resinosus, grumos habens albicantes, quam diutissime in odoris gratia permanens, quique dum mollitur, melleam quamdam humiditatem ex se remittit. Talis est gabalites, pisidius ac cilicius. Deterior niger, friabilis ac furfurosus. Invenitur et lacrima gummi similis, transparens, myrrhæ æmula; verum hæc raro nascitur. Adulterant autem arboris ipsius scobe, vermiculorum erosione facta, admisto melle et iridis crassamento aliisque nonnullis. Non desunt, qui et ceram aut sebum aromatis imbutum ad solem acerrimum cum styrace subigant et per colum latis foraminibus pervium in aquam frigidam, quasi vermiculos effingentes, exprimant et venumdent, quem styracem ideo vermiculatum appellant. Imperiti eum tanquam sincerum admittunt, non attenti ad odoris insignem vehementiam. Est enim admodum acris, qui fraudis expers est. * * * *" Pedanii Dioscoridis Anazarbei *de Mat. Med., libri* v., ed. Curt. Sprengel. Lips. 1829, 30. T. i. p. 82 (lib. i. cap. lxxix.).

[3] Possibly some residue obtained in making the preparation called *Irini spissamentum* described lib. i. cap. lxvi.

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those who pound with storax in very hot weather, either wax or tallow imbued with aromatics, and press it through a strainer having wide openings, into cold water, forming as it were, little worms: they sell this, which they call *vermiform Storax*. Inexperienced persons admit it as genuine, not regarding its remarkably powerful odour: for that which is not fraudulent is somewhat strong.

The particulars given by Pliny in his chapter on Storax, are very minute and explicit, although his supposition that the drug packed in reeds was a natural production and his notion of its being attacked by insects, must be regarded as erroneous.

The following is Pliny's account:—

Account by Pliny.

"That part of Syria joining up to Judæa, and lying above Phœnicia, produces *Storax*, which is found in the vicinity of Gabala and Marathus, as also of Casius, a mountain of Seleucia. The tree bears the same name and has a strong resemblance to the quince. The tear has a harsh taste, with a pleasant smell; in the interior it has all the appearance of a reed, and is filled with a liquid juice. About the rising of the Dog-Star, certain small winged worms hover about this substance and eat it away, for which reason it is often found in a rotten state, with wormholes full of dust. The Storax next in estimation after that already mentioned, comes from Pisidia, Sidon, Cyprus and Cilicia; that of Crete being considered the very worst of all. That which comes from Mount Amanus, in Syria is highly esteemed for medicinal purposes, and even more so by the perfumers. From whatever country it comes, that which is of a red colour is preferred, and it should be both unctuous as well as viscous to the touch; the worst kind is that which crumbles like bran, and is covered all over with a whitish mould. This substance is adulterated with the resin of cedar or with gum, and sometimes with honey or bitter almonds; all which sophistications may, however, be detected by the taste. The price of Storax of the best quality is seventeen denarii per pound.[1] It comes also from Pamphylia, but this last is more arid and not so full of juice."[2]

The localities here mentioned include those cited by Dioscorides: and most of them can be identified. Gabala is the

[1] Equal to 16*s*. per lb. avoirdupois.

[2] Pliny's *Natural History*, Bostock and Riley's translation, book xij. chap. 55.

1857. modern village of Djebeleh, a few miles to the south of Latakia. The ruins of Marathus still exist. Casius and Amanus are mountains near the Gulf of Iskenderun, still to be traced under Turkish names. The position of the ancient countries of Pisidia, Pamphylia and Cilicia in the south-eastern part of Asia Minor is well known; and Sidon, Cyprus and Crete are familiar to all. In several of these localities, *Styrax officinale* is at the present day a common wild shrub.

Storax of the ancients.

The drug thus described by these ancient authors is that which I conceive to be the original and legitimate Storax, namely a fragrant resin in separate, or more or less agglutinated tears, somewhat resembling Benzoin, exuded either spontaneously or after incision, from the trunk of the *Styrax officinale* of Linnæus. That such a drug in a state of greater or less purity, was in former, and even in comparatively recent times, an article of commerce, appears certain from the specimens still existing in a few old collections of Materia Medica as well as from the descriptions of the best Storax given by the pharmacologists of the last century agreeing very fairly with the account left by Dioscorides.[1]

This fine kind of Storax, always extremely scarce, was called *amygdaloid* from the small, white, almond-like tears of which it partially consisted. It also bore the name *Styrax calamites*, a term derived from the ancient method of packing it in reeds (*calami*).[2] It has, however, wholly disappeared from commerce, its name alone *Styrax calamites* or *calamita* being retained in favour of that odoriferous, sawdust-like compound which we are accustomed to find in the shops. In France, it is applied to a black, extractiform, odoriferous substance which I shall more particularly describe in a future paper.

Styrax calamites.

[1] See especially Kirsten, *Exercitatio de Styrace*, Altorf, 1736. 4to.

[2] According to Matthiolus, the allusion to *Calami* in connexion with Storax first occurs in Galen. I find the passage to be as follows:

"Manifestum insuper est Styracem qui in calamis è Pamphiliâ apportatur, Andromachum præcipere. Paucissimus autem illic styrax nascitur: tantumque ab hoc vulgari distat, quantum à vino quod in tabernis venditur Falernum." (Galen. *De Antidotis*, lib. i. cap. 14.)

The term *Calamites* has been supposed to be derived frem καταβαλίτης, a

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Collection of Storax.

Although we possess no modern account of the collection of solid Storax, confirmatory of that given by Dioscorides, other than those I have quoted (which do not, however, relate to collecting the drug for the purposes of commerce), there exist two remarkable statements of the method of collecting *Liquid Storax*, which it will not be unprofitable to examine with some attention. I ought, however, first to state that it is questionable whether the Greeks were acquainted with *Liquid Storax*: Arab writers, on the other hand, distinctly mention it, though their accounts are far from satisfactory and clear.[1]

The first of these two statements is that of James Petiver, an apothecary of London, who was noted as the possessor of a considerable collection of objects of natural history.

Account by Petiver.

In the year 1708, that is ten years before his death, Petiver presented to the Royal Society of London a communication which, *verbatim et literatim*, is as follows:—

"*The Manner of making* Styrax liquida, *alias* Rosa Mallas.
Communicated by Mr. James Petiver, *F.R.S.*

Rosa Mallas.

Rosa Mallas grows upon the Island *Cobross*, at the upper end of the *Red Sea* near *Cadess*, which is 3 days Journey from *Suez*: It is the Bark off a Tree (taken off every Year, and grows again) boiled in Salt Water till it comes to a Consistence like Bird-lime, then separated and put into a Cask and brought to *Judda*, and so to *Mocha* in *June* and *July*, where it sells from 60 to 120 Dollars *per* Barrel, according to its Goodness: the best is what is freest from Clay and Dirt, which is commonly mixed with it; and the way to try it is by washing it in Salt Water which will cleanse it: The *Arabs* and *Turks* call it *Cotter Mija*.
N.B. *A Barrel is* 420 l."[2]

A statement so precise and circumstantial was received with more or less credit, and we find it quoted by Geoffroy,[3] Hill,[4]

vulgar reading for γαβαλίτης, as explained at length by Matthiolus (*Comm. in lib. i. Dioscorid.* cap. lxviii.)

[1] Avicennæ *Liber Canonis*, lib. ii. tract. 2. cap. 431. 600. 623. (ed. Venet. 1564.)

[2] *Philosophical Transactions*, 1708-1709. Vol. xxvi. p. 44.

[3] *Tract. de Mat. Med.* (1741), t. ii. p. 493.

[4] *History of the Materia Medica* (1751), p. 713.

1857. Alston,[1] Mérat and De Lens,[2] Martiny,[3] Guibourt,[4] Pereira,[5] Royle,[6] &c.

Hill, indeed, quaintly remarks, "It is a little unlucky that nobody has given us any description of this *Rosa Mallas*."—But is *this* the only ambiguity? Let us first ask,—*Does there exist any island of* Cobross *at the upper end of the Red Sea?*

Thanks to the excellent chart of the Red Sea made from the surveys of Messrs. Moresby and Carless in 1830-33, and to the minute *Sailing Directions for the Red Sea*, both published by the Hon. East India Company, we have a mass of very exact and positive information relating to its coasts, and to its islands from the largest, down to the very rocks and shoals. Now

Island of Cobross.

Petiver makes his island of *Cobross* to be "*near Cadess, which is 3 days journey from Suez.*" To what distance we ought to consider this to be equivalent, I know not; but it is evident from the chart already referred to, that there is no island in the Red Sea nearer to Suez than about 160 miles. Neither this island, nor any other in the Red Sea, bears the name of *Cobross*, or any other name which can be supposed to represent it,—that is, so far as my researches have gone, and I have taken much pains in investigating the subject.

Doubts on the subject.

Again,—are there any islands in the Red Sea extensively wooded, as Petiver's account would lead us to suppose? On this point, the minute information in the *Sailing Directions*, is entirely of a negative character.

Distrusting my own judgment in such a question, I applied to John Walker, Esq., Geographer to the Hon. East India Company, and to the Rev. Charles Forster, author of the *Historical Geography of Arabia*, gentlemen whose acquaintance with sources of information on such matters, might, I thought, suggest some explanation of Petiver's statement: but neither of them has been able to throw any light upon it.

[1] *Lectures on the Materia Medica* (1770), vol. ii. p. 418.
[2] *Dictionnaire de Matière Médicale*, t. iv. (1832), p. 128.
[3] *Encyklop. d. med.-pharm. Nat. u. Rohwaarenk.* bd. i. (1843) p. 94.
[4] *Histoire des Drogues Simples*, t. ii. (1849), p. 294.
[5] *Elem. of Mat. Med.* vol. ii. (1850) p. 1216.
[6] *Manual of Mat. Med.* (1853) p. 639.

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Although I am unable to find a *Cobross* in the Red Sea, I must state that D'Herbelot in his *Bibliothèque Orientale* gives *Cobros*, as a synonym of *Cyprus*: and also, that Pliny mentions an island of *Coboris* or *Covoris*, which has been identified as one of the Sohar Isles, near Burka, a town situated on the East coast of Arabia, near the entrance to the Persian Gulf.[1] The position of either of these islands is, of course, perfectly irreconcilable with that of Petiver's *Cobross*.

Cobross, a synonym of *Cyprus*.

It is somewhat surprising that of the many authors who have quoted Petiver's account of *Liquid Storax*, none appears to have been struck with the fact that the drug is not said to be conveyed from "Cobross" to Europe, but that it is "*brought to Judda and so to Mocha*,"—that is to say, it is carried to a spot some 1300 miles south of Suez.

So much for the fallacies in Petiver's account of "The manner of making *Styrax Liquida*." In a future part of this notice, I will endeavour to show what traces of truth it contains.

The next statement on which I propose to offer some remarks, is that of Dr. X. Landerer, of Athens, as contained in a communication published in Buchner's *Repertorium* for 1839.[2]

This communication, I translate thus :—

Account by Dr. X. Landerer.

The Storax plant, *Styrax officinale* is found in various parts of continental Greece, as well as in some of the islands of the Archipelago. There, however, it forms but a small shrub and does not possess the agreeable odour ascribed to it by botanists. The bark of the plant occurring in Greece has not the slightest odour, which probably is due to neglect in cultivation. On the contrary, such is not the case with the plant as found in the Turkish islands of Rhodes and Cos, and especially with it as cultivated by the people of Cos. (*a*)

As I obtained some time since in Syra from a merchant coming from Rhodes some information on the subject, I will make it public, not doubting that, though but little, it will be acceptable.

[1] Forster's *Historical Geography of Arabia*, Lond. 1844. Vol. ij. p. 230.

[2] *Einige Worte über die Gewinnung des Storax liquidus* vom Prof. und Leibapotheker X. Landerer in Athen, *Buchner's Rep. für d. Pharm.* Bd. 18. s. 359-362.

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Account by Dr. X. Landerer.

The Storax plant is called in Cos and Rhodes *βουχοῦρι* (*buchûri*). At its flowering season, it fills the air with the most agreeable vanilla-like perfume. At the period for the collection of the bark and younger twigs, which are employed for the preparation of *Buchuri-jag*, *i.e. Styrax-oil* (*oil* being called in Turkish, *jag*), permission is obtained from the Pasha residing at Rhodes, a small sum being paid for it. Those who are provided with the permission to collect, now make with small knives longitudinal incisions and peel off from the stem the fresh pieces of bark in the form of little narrow ribbons. Owing to their adhesive juice they easily stick together [*backen sie leicht zusammen*]; from them are formed masses of one *oke* weight (= 2lbs.), which are reserved for the preparation of *jag*, or are immediately purchased by Rhodian merchants and sent to Rhodes.

The preparation of *Buchuri-jag* is effected by merely pressing the before-mentioned masses in presses somewhat warmed, called *Styrakia*, and not by boiling. The *jag* obtained by gentle pressure is of an unctuous consistence, a light grey colour, and diffuses a very agreeable vanilla-like odour. This is the only sort that is exported; but in Cos and Rhodes, it is also used in the preparation of a very odoriferous mass made by the addition of finely-powdered Olibanum and formed into cakes of the size of a fist, which are called *Styrakia*. The preparation of these masses belongs exclusively to the conventual clergy, who distinguish their manufacture with the convent seal.

By repeated warming and stronger pressure, an almost black *Buchuri-jag* is obtained, which is used by the inhabitants themselves for the most healing ointments and medicines.

The bark remaining after the expression of the *jag* is bound together and conveyed partly to Constantinople and partly to Syra and there used for fumigation.

With regard to the decoction of the bark and the adulteration of Styrax-balsam with turpentine, the Rhodian merchant assured me that they would not know how to go about it; and that the adulteration with turpentine might, in case of detection, involve even the punishment of death.

[Note *a*.] The Storax trees appear at that place to be of important value, and are given to the young women as dowry, in the same manner as in Greece the bride is presented with so many Olive-trees.

Erroneous information.

That Dr. Landerer has been greatly deceived by his informant will, I think, be very evident from the subjoined testimonies :—

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Testimonies cited.

1. Niven Ker, Esq., who was for several years British Consul at Rhodes, informed me that he was quite ignorant of the carrying on in that island of the manufacture described by Dr. Landerer.

2. Sidney H. Maltass, Esq., of Smyrna, in a letter to me under date 7 October, 1853, speaking of *Liquid Storax*, says "Cos and Rhodes produce none."

3. Lieutenant Robert Campbell, R.N., H.B.M. Consul at Rhodes, writes from Rhodes under date 16 December, 1855, that Dr. Landerer, in attributing to the islands Cos and Rhodes the production of Storax, has committed an egregious error, as they have never produced it.

Moreover, the evidence of Mr. Maltass proves, as I shall shortly show, that *Styrax officinale* is *not* the tree yielding *Liquid Storax*.

There are other exceptional points in Dr. Landerer's account which I will for the present pass over, remarking only that the statement that liability to the punishment of death is incurred in the case of a person being detected adulterating Storax with turpentine, is characterized by Lieutenant Campbell as "a mere invention."

Previous to detailing the information which I have collected as to the method of preparing *Liquid Storax*, it will be well briefly to review the various opinions which have been held as to its origin.

Origin of Liquid Storax.

1. Many of the older writers on Materia Medica consider it an artificial compound; Dale, in particular, asserts that what was found in the London shops in his time (1693) was altogether factitious.[1]

2. Those writers who adopt Dr. Landerer's statement, regard *Liquid Storax* as the produce of *Styrax officinale*, Linn.

3. By many authors, *Liquid Storax* is referred to *Liquidambar styraciflua*, Linn., a tree found in the southern part of the

[1] "Verum quod in officinis nostris pro Styrace liquido venditur omnino factitia res est, ut certior factus sum à pharmacopolis variis Londinensibus." —*Pharmacologia*, Lond. 1693, p. 427.

1857. United States, in Mexico, and in other parts of Central America.

Liquid Storax imported from the Levant.

However capable that tree may be of producing an analogous resin, it is well ascertained that the *Liquid Storax* used in England is all imported from the Levant; and there are sufficient reasons to conclude that such is also the case with that used on the continent, and that it is certainly not the produce of America. I therefore dismiss the supposition that the *Liquid Storax* of commerce is of transatlantic origin.

4. By some authors, *Liquid Storax* has been conjectured to be the produce of *Liquidambar altingiana,* Blume.

This tree is a native of the islands of the Indian Archipelago and of Burmah, where the inhabitants occasionally extract from it an odoriferous semi-fluid resin; but the product is not abundant, nor does it resemble the *Liquid Storax* of commerce; there is not moreover, the slightest evidence of it reaching Europe in any quantity.

It is, however, a curious fact that the name by which this tree is at the present day known to the Malays, is *Rasamāla,* a word very close to Petiver's *Rosa Mallas.* To this I shall revert in a future page.

5. *Liquidambar orientale,* Miller, is regarded by Guibourt, Lindley, the authors of the French *Codex,* and some others, as the source of *Liquid Storax,* an opinion which I shall be able to show to be correct.

Having brought under review the various opinions current as to the origin of *Liquid Storax,* and stated the points on which I consider them erroneous, I will now proceed to communicate the information which I have myself received regarding the drug from three valued correspondents in the Levant, namely, Sidney H. Maltass, Esq. of Smyrna, Lieut. Robert Campbell, R.N., H.B.M. Consul in the island of Rhodes, and Dr. James McCraith, of Smyrna.

Personal Information

The information is still not quite perfect, but in all essential particulars I believe the following is a correct account of the

PREPARATION OF LIQUID STORAX. 1857.

Botanical Origin.—The tree from which Liquid Storax is obtained, is *Liquidambar orientale*, Miller (*L. imberbe* Aiton), as is proved by specimens of the leaves and fruits procured at my request by Mr. Maltass (see wood-cut).

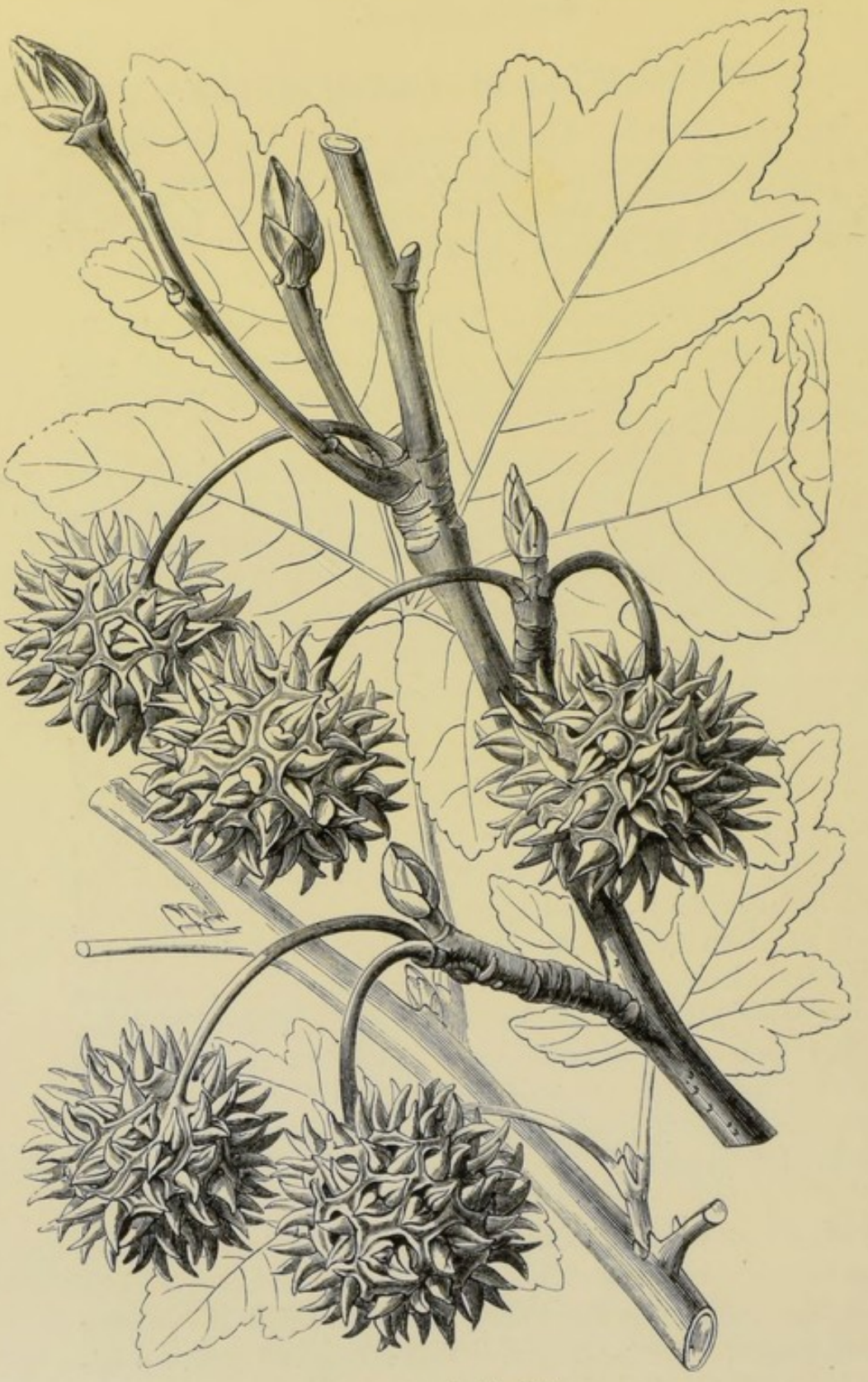
Localities.—South-west of Asia Minor.—Forests in the district of Sighala near Melasso; forests near Moughla, and near Giova and Ullà in the Gulf of Giova; also near Marmorizza and Isgengak opposite Rhodes.

Account by Mr. Maltass.

Mr. Maltass passed through a dense forest of *Liquidambar* between the village of Caponisi and the town of Moughla on the 7th or 8th of May, 1851. He describes it as consisting of trees resembling the plane, but evidently of a different species, the leaf being smaller, and each tree far denser in foliage than the plane usually is. "I also observed," says he, "that most of the larger trees had the [outer] bark stripped off from the trunk and the inner bark scraped off. I gathered some of the fruit and leaves, and proceeded on my journey towards Moughla, my road lying for upwards of an hour through this beautiful forest. I observed that the trees were from twenty to thirty feet in height, but whenever there was a break in the forest and the trees had sufficient air and space, they were of larger growth, many of them being forty feet high, more especially in the immediate vicinity of streams of water. My guide assured me that in some places in the forest in the direction of Melasso, he had seen some of these trees sixty feet in height. He could not tell me the name of the tree, but stated that an oil was produced from it called *Buchur*, and that the trees were mutilated to obtain it."

Extraction of Liquid Storax.

Extraction of the Liquid Storax.—In June and July, the outer bark is stripped off on one side of the tree and (according to Lieut. Campbell) made into bundles and reserved for the purpose of fumigation. The inner bark is then scraped off with a semi-circular or sickle-shaped knife and thrown into pits until a



Liquidambar orientale, Mill.
From a specimen obtained by S. H. Maltass, Esq., from the coast of Asia Minor, opposite Rhodes.
[Fitch, *del.*]

sufficient quantity has been collected. Mr. Maltass states that it is then packed into strong horse-hair bags and subjected to pressure in a wooden lever press. Upon removal from the press, hot water is thrown over the bags and they are pressed a second time, after which the greater portion of the resin will have been extracted. 1857.

Lieut. Campbell's account is a little different: he says the inner bark is boiled in water over a brisk fire, upon which the resinous part comes to the surface and is skimmed off. The boiled bark is next put into hair sacks and pressed, boiling water being added to assist in the extraction of the resin, or, as it is termed, *yagh* (i.e. *oil*).

Dr. McCraith says that the Storax collectors, who are chiefly a tribe of wandering Turcomans called *Yuruks*, are armed with a triangular iron scraper with which they scrape off, together with the juice of the tree, a certain quantity of bark, which they collect in leathern pouches suspended to their belts. When a sufficient quantity has been obtained, it is boiled in a large copper and the separated liquid resin is run into barrels. The residual bark is placed in hair-cloth and pressed in a rude press, the extracted resin being added to the general mass.

The product obtained by the processes here described, is the grey, opaque, semi-fluid resin, well known as *Liquid Storax*.

The bark from which the *Liquid Storax* has been extracted, is emptied out of the bags and exposed in the sun to dry, after which it is shipped to the Greek and Turkish islands and to many towns in Turkey, where it is much esteemed for the purpose of fumigation, although since the disappearance of the plague, its employment has greatly diminished. Storax Bark.

This is the substance known to pharmacologists as *Cortex Thymiamatis* or *Storax Bark*, as is proved by abundant specimens sent me by Mr. Maltass.

ADULTERATION. — Mr. Maltass says that Liquid Storax is rarely pure, being adulterated by the admixture of sand and ashes.

COMMERCE. — Lieut. Campbell states that the quantity of

1857.

Exportation of Liquid Storax.

Liquid Storax annually extracted amounts to about 20,000 *okes* (500 cwt.) from the districts of Giova and Ullà and 13,000 *okes* (325 cwt.) from those of Marmorizza and Isgengak.[1]

It is exported in casks to Constantinople, Smyrna, Syra and Alexandria. Some is also packed with a certain proportion of water in goat-skins and sent, either by boats or overland, to Smyrna, where it is transferred to casks and shipped mostly to Trieste.

It appears from Mr. Maltass, that formerly the whole, both of the resin and the residual bark, was bought by the merchants of the island of Rhodes, but at what period and under what circumstances this occurred, I have not been able to learn.[2]

Eastern names.

Though I have no pretensions to be an Oriental scholar, I may be allowed to offer a few words respecting some of the eastern names of *Liquid Storax* and the bark which remains after its extraction.[3]

Liquid Storax is known to the Turks by the name قره كونلك ياغى *Kara ghyunluk yaghy*, i.e., *Black Frankincense Oil*.[4] It is also called بخور ياغى *Bukhur yaghy*, i.e. *Incense Oil* and sometimes (according to Mr. Maltass) سغاله ياغى *Sighala yaghy*, i.e. *Sighala Oil*, from the district between Melasso and Macri, where much of it is collected.

The Greeks designate it Στύραξ ὑγρὰ, but often use the Turkish name *Bukhur yaghy*.

[1] In English commerce, forty *okes* are reckoned as equal to one hundredweight.

[2] Dr. Landerer's account appears to have reference to this period; and even his statement of the *cultivation* of the Storax plant (whatever plant is intended) has some support from the following passage in Duhamel's *Traité des Arbres*, t. ij. p. 288.

"Au Levant on cultive aux environs de Stanchir [Cos], les arbres qui donnent le Storax, et on les multiplie par marcottes." Dr. Landerer's βουχοῦρι, it will also be observed, is traceable in the Turkish name *bukhur*.

[3] I will here acknowledge the assistance kindly afforded me by Dr. Greenhill, the translator of Rhazes, on the subject of Arabic names; and also that of J. W. Redhouse, Esq. with regard to Turkish names.

[4] *Olibanum* is called in Turkish كونلك *ghyunluk*.

In a *Report of the External Commerce of Bombay* to which my attention was directed by my friend Dr. Royle, the term *Rose Malloes* is applied to a drug enumerated under the category of *Import by Sea into the Port of Bombay*.[1] 1857. Rose Malloes.

The recurrence of this strange name, which Petiver's account of *Liquid Storax* had made familiar, struck me as very curious, and I wrote to Bombay for a sample of the drug so called. This was kindly procured for me at the Bombay Custom House by Dr. Carter, and proved to be our ordinary *Liquid Storax*. It is imported chiefly from the Red Sea, which it doubtless reaches from Alexandria, to which port I found it was shipped from Rhodes. Here then is the explanation of Petiver's statement of the drug being carried *southward* from Suez—it being in fact, on its way to India.

His term *Cotter Mija* is the Arabic قطر ميعة *Katr may'a*, ميعة *may'a* being one of the Avicennian terms for Storax, and قطر *katr* (literally *a drop*), a prefix indicating its liquid nature.[2] Eastern names.

The only other author with whom I am acquainted that alludes to *Rosa Mallas* is Garcia,[3] who, when describing the various sorts of Benzoin, mentions "*Roça-malha*," which he asserts is the name applied by the Chinese to *Liquid Storax*.

Whether it is the resin of the *Rasamāla* (*Liquidambar*

[1] The following is an extract from the Report referred to :—

	cwt.	qr.	lb.		
"Rose Malloes."					
"From Aden	5	0	0	value	186 rupees
„ Arabian Gulf . .	41	0	0	„	1574 „
„ Persian Gulf . . .	12	0	0	„	480 „
Total . .	58	0	0		2240 rupees."

[2] Lib. ii. cap. 623. (ed. Venet. 1564).—It can scarcely be doubted, that in this chapter on "*Miha vel Meha*" which the translators have rendered *Storax*, Avicenna refers to the modern *Liquid Storax*. The passage is as follows :

"* * Storax humida alia est, quæ extrahitur per se ipsam gumma : et alia est quæ extrahitur cum decoctione : per se autem extracta, est citrina, et quando antiquatur, declinat ad aureum colorem, et est [preciosa et grata] : sed quæ extrahitur ex cortice est nigra : et illud ideo quoniam extrahitur cum decoctione corticis illius arboris, et quod extrahitur, est storax humida : et quod remanet sicut fæx et vinacia, est sicca."

[3] *Aromatum et simplicium aliquot medicamentorum apud Indos nascentium Historia*. Antv. 1574.

1857. *altingiana* Bl.) that is here intended, and whether the *Rosa Mallas* of Petiver and the *Rose Malloes* of the Bombay List are but corruptions of the same term applied to a different substance, are points which I shall not attempt to decide.

The residual bark after the extraction of the *Liquid Storax*, is known to pharmacologists as *Cortex Thymiamatis*, *Cortex Thuris*, *Thus Judæorum*, *Narcaphthum*, *Storax Bark* or *Red Storax*,[1] and is called in Turkish قره كونلكٔ يپراق *Kara ghyunluk yaprak* or more correctly قره كونلكٔ يپراغى *Kara ghyunluk yapraghi*, literally *Black Frankincense Leaf*.

In modern Greek it is known by the simple name of Στύραξ.

The name Θυμίαμα (Incense) does not appear to have any special application to Liquidambar Bark.

Belon has asserted that this bark is called *Maurocapno*,[2] and
Greek names. authors have quoted the name on his authority. I cannot but think this an error; Μαυρὸ καπνὸ signifies literally *Black Smoke*, and in modern Greek it is used by metonymy for *Black Tobacco*. It does not appear to be now applied to the Liquidambar bark.

The name Νάσκαφθον or Νάρκαφθον used by Dioscorides to designate a certain odoriferous bark from India,[3] has been thought by many authors to have reference to the modern *Cortex Thymiamatis*. But if the latter were collected in the days of Dioscorides, that author, a native of Asia Minor, could scarcely have been so ignorant of the locality of its production, as to have regarded it as an *Indian* drug. Moreover, neither the names Νάσκαφθον nor Νάρκαφθον (nor Λάκαφθον used by Paulus Ægineta[4] perhaps for the same substance) are known in modern Greek. I confess therefore I do not see evidence for

[1] Amygdaloid Storax is also sometimes called *Red Storax*.

[2] "Je vei aussi descharger vn brigantin dessus la riue du port [de Rhodes], plein d'vne drogue propre en medecine, appellée Storax rouge. Les Grecs la nomment maintenant *Maurocapno*. Et m'a lon dit qu'il croist en l'isle."—Belon, *Observations de plvsievrs Singvlaritez* &c. (1554) liv. 2. chap. 14.

[3] Νάσκαφθον, οἱ δὲ νάρκαφθον, καὶ τοῦτο ἐκ τῆς Ἰνδικῆς κομίζεται· ἔστι δὲ φλοιῶδες, συκαμίνου λεπίσμασιν ἐοικὸς, θυμιώμενον διὰ τὴν εὐωδίαν, καὶ μιγνύμενον τοῖς σκευαστικοῖς θυμιάμασι, ὠφελοῦν καὶ μήτραν ἐστεγνωμένην ὑποθυμιασθέν. Diosc. *de Mat. Med.* ed. Sprengel, lib. i. c. 22.

[4] Lib. 7. c. 22.

identifying the Dioscoridean drug with the product of *Liquidambar*. **1857.**

Conclusions respecting Storax.

The conclusions to which this long investigation leads, may be thus briefly summed up:—

1. That the original and classical Storax was produced by *Styrax officinale*, Linn.
2. That, always scarce and valuable, it has in modern times wholly disappeared from commerce.
3. That the accounts of the collection of *Liquid Storax* given by Petiver and Landerer are in many important particulars grossly erroneous.
4. That *Liquid Storax* is the produce of *Liquidambar orientale*, Miller, and that it is collected in the south-west of Asia Minor.
5. That the bark of *Liquidambar orientale*, Miller, after *Liquid Storax* has been expressed from it, constitutes the *Cortex thymiamatis* of Europe.
6. That there is no evidence of the Νάσκαφθον of Dioscorides being the bark of *Liquidambar orientale*.

ADDITIONAL OBSERVATIONS ON STORAX.

(*Storax, nachträgliche Bemerkungen.*)

1863.

When I had the honour of laying before the Pharmaceutical Society some observations on Storax,[1] I hoped to be able to communicate at no distant interval such additional information as would complete the history of that drug. During the six years that have since elapsed, I have not lost sight of the subject, and although I am still unable to determine all the points I wished to clear up, I am induced, by reasons which I will presently explain, again to bring it before the Society.

Recapitulation.

To render my remarks more intelligible, I will briefly recapitulate the conclusions which my former paper was intended to establish, and which are the following:—

1. That the Storax of ancient times was produced by *Styrax officinale*, L.
2. That this substance has disappeared from the commerce of modern days.

[1] *Pharm. Journ.* vol. xvi. p. 417.

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3. That the resin called *Liquid Storax* is produced by *Liquidambar orientale*, Mill., a tree indigenous to the south-west of Asia Minor, where the drug is collected.

Professor Krinos of Athens.

These conclusions I had reason to believe were generally accepted, until I received a few weeks ago a pamphlet by Professor Stamatios D. Krinos, of Athens, which somewhat disputes their correctness. In vindicating my own opinions, however, I wish to draw attention to the new facts put forth in the learned essay of the Greek Professor of Pharmacology, and to couple with them some additional information on Storax of which I have become possessed.

Professor Krinos, whose pamphlet, entitled Περὶ Στύρακος διατριβὴ φαρμακογραφικὴ (*A Pharmacographical Essay on Storax*),[1] is in modern Greek,[2] commences by stating that he will endeavour to show :—

1. That *Liquid Storax* was known to the ancient Greek physicians.

2. The reasons why he presumes that the text of Dioscorides requires a slight change.

3. That the *Solid Storax* of ancient authors was not the produce of *Styrax officinale*, L., but of the tree called in modern Greek Συγία and by botanists *Liquidambar orientale*, namely, the same tree as that from the bark of which *Liquid Storax* is obtained by decoction and expression.

Ancient History of Storax.

In support of the first proposition Dr. Krinos gives an elaborate review of the ancient accounts of Storax, from which, but especially from the statements of the later Greek writers, he draws the conclusion that Liquid Storax was a drug with which they were acquainted. In the works of Paulus Ægineta, he observes, we first find mentioned, besides Solid Storax, a second kind, *Liquid Storax*, and also the resin of the tree, Συγία, which is the same thing as Liquid Storax. Aetius, who lived in the sixth century is cited as mentioning a *Liquid Storax;* and also a spurious treatise of Galen, the writer of which referring to the

[1] Ἐν Ἀθήναις, 1862, 8vo, p. 27.

[2] I am indebted to the kindness of D. P. Scaramanga, Esq., for translating the pamphlet.

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resin of ζυγία explains that it is synonymous with Liquid Storax. The Arab authors are then reviewed, and subsequently the pharmacologists of the last and present century. The learned author then points out that the word ζυγία, properly signifying *maple*, is now applied in the south-west of Asia Minor to *Liquidambar orientale*, a tree which *resembles* a maple or a plane. He also states that about the year 1841, he proved that Liquid Storax was obtained from this tree, and that an account of this fact was published at the time in the *Melissa*, an Athens newspaper.

ζυγία, the Maple.

The second proposition of Professor Krinos is that the text of Dioscorides is incorrect. Dioscorides states that the Storax-tree resembles the quince, which is certainly the case if *Styrax officinale* is intended, but by no means so if *Liquidambar orientale*.[1] But Professor Krinos holds that the Storax (solid and liquid) of ancient authors is *not* the produce of *Styrax* at all: hence the difficulty of admitting the statement of Dioscorides, and the extraordinary proposal of *altering the text* so as to cause that author to say that the tree resembles not a *quince* but a *maple*. In reply to this I may remark that it would be needful to alter Pliny also, and that such a mode of disposing of the difficulty, unless supported by some obvious ambiguities in the early MSS. of these ancient authors, is surely inadmissible.

Proposal to alter the text of Dioscorides.

The third proposition, that the Solid Storax of the ancients was derived from *Liquidambar* and not from *Styrax*, is one from which I entirely dissent; still, I am free to admit that a solid resin derived from the former tree *may* have passed as *Storax* in ancient times, though I am entirely unacquainted with such a substance. Professor Krinos assumes that as no resin produced by *Styrax officinale* now finds its way into commerce, it is impossible to believe that that tree ever really yielded any. In this I do not concur: I have already shown that two respectable authors of the last century, Duhamel and the Abbé Mazéas, actually collected Storax from this tree, the one in Provence,

[1] In modern Greek, the Storax-tree is called Ἀγρία Κυδωνιά, *i.e. Wild Quince.*

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the other in the neighbourhood of Rome. I have also ascertained within the last few weeks from Dr. Kotschy, of Vienna, that in the neighbourhood of Alexandretta, the *Styrax*, which there grows to a tree, still yields its odorous resin. On the other hand, I am bound to acknowledge that the endeavours I have hitherto used to obtain the resin from trees in the south of France, Asia Minor and Syria have not been successful. In Syria it is now rare to find the Styrax forming anything better than a large bush, owing to the practice of cutting it periodically for fuel, and though I have myself examined many such bushes I have failed to find upon their stems any exudation. I believe, however, that where the Styrax attains the dimensions of a tree, better results will be obtained and the correctness of the ancient accounts will be fully vindicated. Not only does the statement of Dioscorides that the Storax-tree *resembles a quince* indicate that he could not possibly have had the Liquidambar in view, but moreover the allusion made by him, and especially by Pliny to localities in Syria where Styrax trees, but not Liquidambar, are still found, lends some weight to the argument. The geographical distribution of *Liquidambar orientale* is very restricted, in which respect it differs from *Styrax*. In the extreme south-west of Asia Minor it is gregarious, forming forests of from 20 to 60 feet in height. Dr. Kotschy informs me that he has reason to believe it occurs at Narkislik, a village near Alexandretta and also on the Orontes. He also tells me that six fine old trees, *certainly planted*, exist at the convent of Antiphoniti on the north coast of Cyprus, but that there are no other in the vicinity: that the tree is there called ξύλον τοῦ Ἐφέντη (Governor's wood), and that it and the bark are used as incense in the churches. He adds that there are two trees of the same kind at the convent of Neophiti near Papho, but no others on the island. Professor Krinos states that the Liquidambar is common in Syria, a fact which is not borne out by the researches of botanists who have visited that country,[1] not one of whom has noticed its occurrence.

Solid Storax.

Statement by Dr. Kotschy of Vienna.

[1] As Boissier, Gaillardot, Blanche, Roth, Bove, Michon, De Saulcy, Lynch, Erdel, Ehrenberg, Hooker, &c.

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For these reasons, I am not prepared to renounce the opinion that the Storax-tree of Dioscorides and other ancient writers was the *Styrax officinale* of modern botanists, nor can I abandon the idea that, like its congener *S. Benzoïn*, it is capable of yielding an aromatic resin, which was once obtained in sufficient abundance to form an article of trade.

Before quitting the subject of Storax, I think it desirable to offer a few observations on some of the substances that are known in pharmacy under that name, and first we will take *Styrax calamita*. *Styrax calamita.*

This drug, as found in English commerce, is so singularly variable that it would be difficult to suppose it a natural product. At Trieste, where certainly some of it is manufactured, it is prepared (as I have ascertained on the spot) by mixing the residual liquidambar bark called *Cortex Thymiamatis*, reduced to coarse powder, with Liquid Storax. Such a mixture I have prepared myself, and can assert that it constitutes excellent "*Styrax calamita.*" When first mixed (in the proportion of 3 to 2) it forms a somewhat moist and clammy mass, which in the course of a few weeks develops an infinity of minute silky crystals, giving the whole an appearance of mouldiness. If the bark is scarce, common sawdust, I am informed, is substituted for it; and olibanum, red earth, and honey are also employed in producing *Styrax calamita* of inferior quality. The drug is said to be manufactured also at Venice and Marseilles.

According to Professor Krinos, the Greek monks, particularly those of the island of Symi, prepare by mixing olibanum with Liquid Storax certain resinous cakes which they sell for incense under the name of ψευδομοσχολίβανον or στουράκι. It is a compound of this sort that, in, my opinion, constitutes the *Black Storax* described by Guibourt, Pereira and others, and not unfrequently found in continental drug warehouses. In fact I have more than once prepared such a mixture, which is remarkably fragrant and quite devoid of the coal-tar-like odour of Liquid Storax; an efflorescence of cinnamic acid generally develops itself on the surface of the mass. It is also this *Black Storax.*

1863. substance which appears to constitute the precious incense used at Easter in the Church of the Holy Sepulchre at Jerusalem, and of which small pieces are sold to the pilgrims at an enormous price,—not indeed for burning, but chiefly to be carried as a charm.

In conclusion, I wish to express an earnest desire that any traveller visiting Asia Minor or Northern Syria, or resident in either of those countries, would carefully examine the stems of *Styrax officinale* with a view to discover any adherent resin,—still more that he would perforate the trunk of that tree and observe after the lapse of some time whether such perforation is followed by an exudation of resin. [*N. Repert. f. Pharm.* xii. 241.]

SOME NOTES ON THE MANUFACTURES OF GRASSE AND CANNES.

(*Manufacturen von Grasse and Cannes—ätherische Oele.*)

1857. That portion of the South of France which borders the Mediterranean between Toulon and Nice is noted for its mild, salubrious climate, and also for the growth and manufacture of several productions of interest to the druggist and the perfumer.

A recent visit to the district in question, and especially to the towns of Grasse and Cannes, having given me the opportunity of seeing something of the manufactures there carried on, I have thought that a few lines on the subject might prove acceptable to English readers. Let it be remembered they are but the notes of a passing stranger, and as such not to be taken for more than they are worth.

Grasse. Grasse is a town of some 13,000 inhabitants, lying at the foot of a range of mountains, and open to the Mediterranean from which it is distant about eight or nine miles. The olive is cultivated in great abundance in all the adjacent country, and grows far more luxuriantly than in many other olive districts of the South of France. The mildness of the climate is still more manifested by the orange trees, which, with here and there a date-palm, form a striking ornament of the little town gardens

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of Grasse. The other plants that are cultivated are the rose, the jessamine (*Jasminum grandiflorum*, L.), mignonette (*Reseda odorata*, L.), and tuberose (*Polianthes tuberosa*, L.).

Cannes.

Cannes, a small town situated on the shore of the Mediterranean, about ten miles from Grasse, enjoys a climate still more favoured. The orange is cultivated more extensively; the rose, jessamine, and other plants under culture at Grasse are likewise grown on a large scale at Cannes; and in addition we find the geranium (*Pelargonium Radula*, Ait., var. *β roseum*) and Cassie (*Acacia Farnesiana*, Willd.), the latter in considerable abundance.

Two species of orange are cultivated about Grasse and Cannes, one known as the *bitter orange* or *bigaradier*, the more esteemed and more extensively grown, the other as the *sweet* or *Portugal orange*.

Orange trees.

Orange-trees are grown in all the country in the neighbourhood of Grasse, but especially in places in the vicinity of the coast. When the season arrives, the flowers are collected by itinerant agents called *Commissionaires*, who bring them from the growers to the distillers, their remuneration being the small commission of one *sou* per *kilogramme*, or about $\frac{1}{4}d$ per lb.

Distillates.

The finest Neroli and finest orange flower water are distilled from the flowers of the bigaradier. Inferior Neroli, not worth more than half the price of the finest, is yielded by the flowers of the sweet or Portugal orange. The essential oil called *Essence de Petit Grain* is distilled from the leaves of the bigaradier: the distilled water mixed with that of the flowers, is sold as an inferior quality of orange flower water.

Roses are cultivated close to the town of Grasse, as well as in all the country adjacent, often on a very small scale and in situations apparently very arid. In the month of May the flowers are collected daily, and brought by the growers to the manufactories for sale.

Provence Otto.

The rose water of Provence is of very superior quality: essential oil or otto of roses is separated from it after distillation. This otto differs from the Turkish, even from the purest

1857. specimens, in remaining congealed at a much higher temperature. In the market it commands a far higher price than the Turkish otto, being worth from 1800 to 2000 francs the *kilogramme*.[1] It is but little in demand, and the supply is comparatively small.

Jessamine. The jessamine, which is cultivated upon an extensive scale, is *Jasminum grandiflorum*, L., a species with large white, exceedingly fragrant flowers. The plants are all grafted upon stocks of *Jasminum officinale*, L.: they are planted close together in rows, and are not allowed to attain a height of more than about two feet. They are kept of this low stature in order to facilitate their protection from cold, which is effected by heaping the earth completely over their stems at the commencement of winter. Jessamine flowers are in season in July and August: they are chiefly employed to communicate their odour to oils and pomades. Jessamine water was shown to me by one manufacturer.

Cassie. The *Cassie*, *Acacia farnesiana*, Willd., is cultivated chiefly about Cannes, where it is to be seen forming a bush or small tree. Its flowers, which are very fragrant, are used in perfuming oil and pomade: they are produced in September, and are worth five to six francs the *kilogramme*.

Geranium. The geranium is cultivated for the purpose of obtaining its essential oil. The tuberose is grown at Cannes as well as at Grasse, its deliciously fragrant flowers being used, like those of the *cassie*, for scenting oil and pomade.

Distillation. The establishments where the distillation of essences and waters, and the manufacture of other articles of perfumery are carried on, are many of them of considerable extent, and kept up in a style of great completeness. The stills are of copper, and heated by a naked fire; they are mostly, if not all, of small size, compared with the great stills used in this country. Their small capacity is, however, compensated by their numbers, some manufacturers having a dozen and others twice that number. In one operation which I saw in progress, the charge

[1] Equal to (say) 41*s*. to 45*s*. per oz.

of the still with leaves of the bigarade orange was about 80 lbs. 1857.

In addition to the manufacture of essential oils, an important branch of industry consists in the preparation of scented fatty oils and pomades. These are prepared by one of two processes, called respectively *Infusion* and *Enfleurage*.

Infusion consists, as the name implies, in infusing the substance whose odour is to be extracted, in a mixture of lard and beef-fat melted in a water-bath, or in warm olive oil. The chief substances thus treated are the flowers of the rose, cassie, bitter orange, and violet. Mignonette is also sometimes subjected to this process. The flowers are immersed entire, except in the case of orange flowers, which are previously bruised. After immersion in the fatty menstruum for a requisite period, the mixture is strained off and the residue pressed. The pomade is preserved in large metal vessels, some of which have a capacity of 300 *kilogrammes*. *Infusion.*

The process of *Enfleurage* is resorted to in extracting the odour of the flowers of tuberose, jessamine, and mignonette. The apparatus required is merely a number of shallow wooden frames of about 18 by 15 inches, inclosing at half their depth a sheet of glass. The edges of the frames rise about an inch above each surface of the glass, and being flat, the frames stand securely one upon another, forming often considerable stacks. The technical name for the frames is *chassis:* those just described are called *chassis aux vitres,* or *chassis aux pommades,* to distinguish them from a different form, which is used where oil has to be submitted to the process of *Enfleurage.* The process in the case of pomade is thus conducted: the unscented fat (which has about the consistence of spermaceti ointment) is weighed into portions, each sufficient for one side of the sheet of glass of a *chassis.* It is then spread over the glass with a spatula in a layer hardly a tenth of an inch thick, care being taken by employing a little inner frame during the spreading, that the fat does not come in contact with the woodwork of the *chassis.* One surface of the glass having been thus coated, the other is coated in like manner; and the *chassis* is ready to receive the *Enfleurage.*

1857.

Enfleurage.

flowers. These are now thinly sprinkled, rather laid one by one, upon the surface of the fat, where they are allowed to remain until the next day or day after, when they are removed and fresh flowers supplied. The *chassis*, charged with fat and flowers, are stacked one upon the other, forming in fact a number of little rectangular chambers, the upper and lower surfaces of each of which are of glass covered with a thin layer of fat sprinkled with flowers, the sides being of wood. In one manufactory which I inspected, only one surface of each *chassis* was coated with fat, the jessamine flowers being placed in an abundant layer upon the other surface: in another establishment, flowers of mignonette were being similarly treated. In this arrangement the flowers do not, of course, come in contact with the fat, but the latter is simply suspended above them to receive and absorb their odour. The flowers require changing either daily or every other day for forty or fifty days before the pomade is sufficiently impregnated with their odour. It is essential that all flowers employed in this process should be collected during dry weather.

When oil has to be impregnated with the odour of flowers, a *chassis* is used which is of larger size, and has a diaphragm of coarse wirework instead of glass. Upon this diaphragm is laid a cotton cloth of a peculiar, thick, absorbent texture, soaked with oil; flowers are then spread upon it, and renewed daily until the requisite odour has been obtained. The oil is then pressed from the cloth and filtered: each cloth imbibes about 2 lbs. of oil.

Extracts.

The preparations called by the perfumers *Extracts* are made by treating the highly-scented oil or pomade with spirit of wine, so as to dissolve out the essential oil which either may have absorbed from the flowers with which it has been placed. This process is more usually conducted by the general perfumer than by the distiller and manufacturer of Grasse or Cannes, the business of the latter being more particularly with what he terms the *matières premières*. The pomade or oil, after having yielded to spirit the greater portion of its odour, is yet valuable for other purposes to which it can readily be applied by the manufacturing perfumer.

1858.

NOTE ON A DRUG CALLED *ROYAL SALEP.*

(*Königs-Salep.*)

Among some specimens of Materia Medica from Bombay, for which I am indebted to the kindness of the late Dr. J. E. Stocks, is one which was received under the designation of *Badshah Saleb* or *King Salep.* The specimen being a solitary one, and no information respecting it, beyond that conveyed by its name, having reached me, it remained almost unnoticed until within the last few months, when an original package, containing about 100 lbs. of an unknown and unnamed drug from Bombay, was offered for sale in the London market. Upon seeing samples of this drug, I recognised it as *Badshah Saleb;* and having obtained from this source a more abundant supply I have been able to some extent to investigate it, and the results of that investigation I will now detail.

Name. [Badshah Saleb.]

In the first place the name *Badshah Saleb* بادشہ ثعلب is partly Persian and partly Arabic,—*Badshah* being the Persian for *King,* and *Saleb* the Arabic original of our word *Salep.* The term may therefore be rendered *King Salep* or *Royal Salep;* and it has doubtless been applied on account of the drug being regarded as Salep of pre-eminently large size. That it is in reality very distinct from true Salep—in fact, that it is not a *tuber,* but a *bulb*—was pointed out to me by my friend Dr. Lindley, who has further suggested its botanical origin. I will, however, first describe the drug as met with in commerce.

Royal Salep consists of dried bulbs (Fig. 1, 2), whose dimensions from base to apex vary from $1\frac{1}{4}$ to 2 inches. The largest specimen weighs 730 grains: the average weight, taking twenty bulbs, was found to be 337 grains. Allowing for considerable irregularity occasioned by drying, the form of the dried bulbs may be described as usually nearly spherical, sometimes ovoid or nearly oblong, always pointed at the upper extremity, and having at the lower either a depressed cicatrix, or frequently a large, white, elevated, scar-like mark. Their surface is striated

1858. longitudinally, besides which there is mostly one broad and deep furrow running in the same direction. They are usually translucent, transmitted light showing them to be of an orange-brown; by reflected light they are seen to vary from a yellowish brown to a deep purplish hue—sometimes shaded at the base into an opaque yellowish white.

Salep Bulbs. In substance the bulbs are dense and horny: they may be cut with a knife, but can hardly be powdered. After several hours' maceration in water, they become soft, opaque, and of a slaty or purplish hue, and increase greatly in volume, regaining in fact their natural size and form (see Fig. 3). If in this state a bulb



Fig. 1.



Fig. 2.

Royal Salep,—natural size.

be cut longitudinally into two equal portions its distinctness from an orchis tuber will be at once manifest. Instead of the homogeneous, fleshy mass of the latter, we find a single fleshy envelope or scale of excessive thickness whose edges overlap each other; this scale surrounding an elongated, flattened bud (Fig. 4).

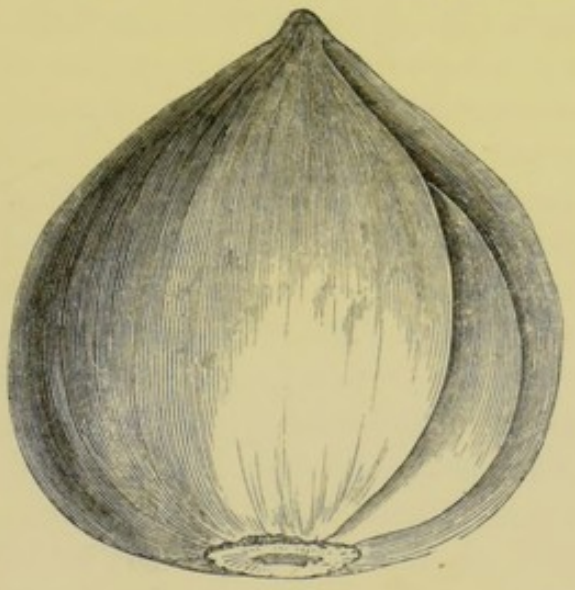
Although this single convolute scale is all that remains in the dried bulb, it is supposed by Dr. Lindley that other scales external to it have been stripped off previous to drying.

Botanical Origin of Royal Salep. Of the plant affording *Royal Salep*, and of its place of growth, nothing appears to be known. I have not been able to discover any notice of the drug in the works of Kæmpfer, Forskal, Ainslie,

Roxburgh, Royle, or O'Shaughnessy. Honigberger, in speaking of the sorts of Salep used at Lahore mentions one resembling a dried fig, which I suppose may be the drug under notice, but he gives no account of it. Dr. Lindley's examination of the bulb leads him to the opinion that it is possibly that of some species of Tulip, of which there are four known to occur in Affghanistan. *Tulipa Oculus-solis* (St. Amans), and some other species, when grown in favourable localities, certainly produce very large bulbs, which have moreover but few scales; but I am ignorant of any having a scale of such enormous thickness

1858.

Dr. Lindley's view



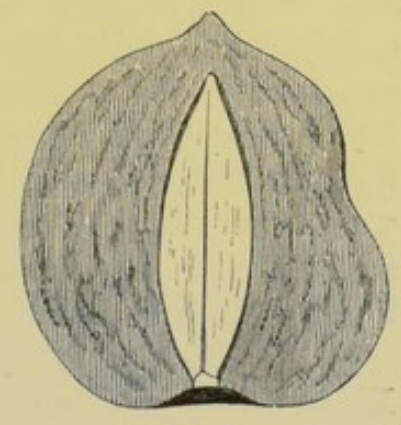


Fig. 4.

Fig. 3.

Royal Salep—Fig. 3, the bulb, Fig. 1, after maceration in water. Fig. 4, longitudinal section of a bulb after maceration.

as that seen in the drug under notice. It is obvious, however, that the question of botanical origin cannot be determined from our limited materials.

Upon the uses of *Badshah Saleb*, I can say very little: from the bulb being mucilaginous and saccharine, I presume it may answer some of the purposes for which orchideous tubers are valued. At the same time it has a bitterish and slightly acrid taste that quite unfits it as a substitute for Salep in this country. The decoction of *Badshah Saleb* is far less mucilaginous than that of true Salep: it is not rendered blue by the addition of a solution of iodine. [*N. Repert. f. Pharm.* vii. 271.]

Uses of Badshah Saleb.

1859.

TRÉHALA.

(*Zwei persische Insectenproducte von Larinus maculatus and L. mellificus.*)

Larinus maculatus.

At the Evening Meeting of the Pharmaceutical Society, January 5, 1859, Mr. Daniel Hanbury, in presenting to the Society a specimen of *Larinus maculatus* and its cocoon, begged to offer a few remarks upon the insect, and to explain upon what grounds it deserved a place in a collection of pharmaceutical substances. Mr. H. stated that among the drugs sent from Constantinople to the Paris Exhibition of 1855, were certain insect-cocoons, called *Tréhala*, which are used in the East in the form of decoction, on account of their saccharine and amylaceous properties. In an interesting paper lately published,[1] M. Guibourt has pointed out that under the Persian name of *Schakar tigal*, these cocoons were described by Father Ange, in his *Pharmacopœia Persica*, so far back as the year 1681, but that until attention was drawn to them in 1855, they were practically unknown to pharmacologists.

Mr. H. added that from specimens collected by Mr. Loftus at Kirrind, in Persia, in the year 1851, and now in the British Museum, it had been ascertained that the insect which produces

Tréhala.

Tréhala is *Larinus maculatus* of Faldermann. This insect, which is a beetle about half an inch in length, belonging to the family *Curculionidæ*, forms its cocoons upon a species of *Echinops*, probably the *E. persicus* of Fischer.

The cocoons are interesting in a chemical point of view, from the fact of their affording a peculiar species of sugar, to which the name *Tréhalose* has been given by M. Bertelot.[2]

[1] *Comptes Rendus*, 21 Juin, 1858, p. 1213.
[2] *Ibid.*, 28 Juin, 1858, p. 1276.

1859.

NOTE ON TWO INSECT-PRODUCTS FROM PERSIA.

(*Read before the Linnean Society, December 16th*, 1858.)

In the month of June last, my friend Professor Guibourt, of Paris, laid before the Académie des Sciences[1] some account of a remarkable substance called *Tréhala*, the cocoon of a Curculionidous insect found in Persia, where, as well as in other parts of the East, it enjoys some celebrity as the basis of a mucilaginous drink administered to the sick. Tréhala.

Specimens of this substance, as well as of another insect-product of Persia, together with the insects themselves, were presented a few years ago to the British Museum by W. K. Loftus, Esq., who obtained them while engaged by the British Government on the question of the Turco-Persian boundaries. W. K. Loftus.

The precise determination of the species of these insects being a matter of doubt, they have at my request been lately examined by M. Jekel, of Paris, an entomologist with whom the family of *Curculionidæ* has long been an especial study. One of these insects M. Jekel has identified with a species of wide distribution; the other proving undescribed, he has drawn up a description of it, which, accompanied by a figure, I have the honour to lay before the Linnean Society. To this, I venture to add a few observations upon the productions to which I have alluded. M. Jekel's identification.

The first of these is *Tréhala* or *Tricala*, under which name it formed part of the collection of Materia Medica sent by M. Della Sudda, of Constantinople, to the Paris Exhibition of 1855, and since deposited in the École de Pharmacie in Paris. Tréhala, or Tricala.

Tréhala (Fig. 2) consists of cocoons of an ovoid or globular form, about $\frac{3}{4}$ of an inch in length; their inner surface is composed of a smooth, hard, dusky layer, external to which is a thick, rough, tuberculated coating of a greyish-white colour and earthy appearance. Some of the cocoons have attached to them the remains of the tomentose stalk of the plant upon which they were formed; others have portions of a tomentose spiny leaf

[1] *Comptes Rendus*, 21 Juin, 1858, p. 1213.

1859.

Description.

built into them; and, more rarely, one finds portions of the flowering heads of the plant, a species of *Echinops*, similarly inclosed. Many of the cocoons are open at one end and empty; others have a longitudinal aperture, originally closed by the stalk of the plant, and still contain the insect; a few are entirely closed. Specimens of this insect, extracted from the cocoons sent to Paris were examined in 1856 by my friend Mr. W. Wilson Saunders, who pronounced them to be *Larinus maculatus* of Faldermann,—a determination also arrived at by M. Jekel from specimens presented by Mr. Loftus to the British Museum. Respecting these latter, one of which is represented in Fig. 1, M. Jekel makes the following remarks:—

Larinus maculatus.

"LARINUS MACULATUS, *Faldermann, Faun. Transcauc.* ii. p. 228, 449, tab. 6. f, 10, et iii. p. 198.—Schönh. *Gen. et Sp. Curcul.* iii. p. 112 et vii. 2. p. 7.—Hochhuth, *Bull. Moscou,* 1847 No. 2. p. 538 (var. γ).

"Var. γ. *Larin. Onopordinis,* Sch. *loc. cit.* iii. p. 111 (excl. synon.).

"Of this species, Mr. Loftus captured several specimens, all of small size: from some of them the pollinosity had been rubbed off, as is represented in the figure by Mr. Ford (*vide* Fig. 1), which shows only a part of the inferior layer of tomentum and the greyish ground of the dorsal and lateral maculæ; the latter, being the most densely coloured in fresh specimens, are always the most persistent. These belong to Schönherr's var. γ, which that author formerly regarded as the *Larinus Onopordinis*, Fabr. Others of Mr. Loftus's specimens, which are very fresh, belong to *Var.* β; none to the typical variety, which is often larger in size.

Habitat.

"This species has a very extended habitat: I have received it from European Turkey (Frivaldski), Beyrouth, Caucasus, Persia (Dupont), &c. &c.; and it is recorded by Schönherr as also found in Barbary and Portugal.

"This is the insect which proceeds from the rough chalky-looking nidus figured by Mr. Ford. *Vide* Fig. 2."

The entomological question being so far disposed of, I may be permitted a few remarks upon the properties which have obtained for *Tréhala* a place among drugs and dietetic substances.

The first author who gives any account of the substance is

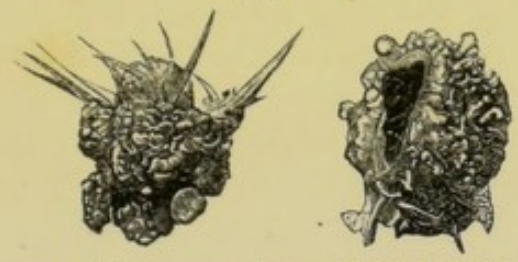
Father Ange, who, in his *Pharmacopœa Persica*,[1] describes it in the following terms:—"Est autem istud medicamentum veluti *tragea* ex nucleo pistacii integro confecta; nam revera sac- 1859. Father Ange.

FIG. 1.



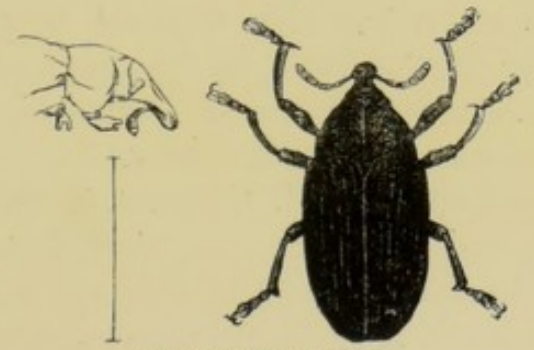
Larinus maculatus, Falderm.

FIG. 2.



The cocoons of *Larinus maculatus*, called in Turkish *Trékala*.

FIG. 3.



Larinus mellificus, Jekel.

charum istud exterius corrugatum et agglomeratum adhæret cuidam nucleo, in quo non fructus, sed vermiculus quidam nigricans Persice *C-hezoukek* bombycis instar reconditur et moritur."

[1] *Pharmacopœa Persica ex idiomate Persico in Latinum conversa.* Lutet. Paris, 1681, p. 361.

1859.

Father Ange also states that the substance is called in Persian *Schakar tigal* (شكر تيغال) literally *Sugar of nests;* but his Arabic names, *Schakar el ma-ascher* (شكر المعشر) and *Saccar el aschaar*, apply to an entirely different substance, namely, to a saccharine matter exuded, after the puncture of an insect, from the stems of *Calotropis procera*, R. Br.[1] of which plant he gives a quaint but tolerably characteristic description.

Mr. Loftus.

Mr. Loftus, who obtained the specimens which he presented to the British Museum, at Kirrind in Persia, in September, 1851, gives as the Persian name of the cocoons *Shek roukeh*—a term, probably, the same as the "*C-hezoukek*" (a misprint?) of Father Ange, but the signification of which I have not been able to discover.

Dr. Honigberger.

Another notice of the same substance, with a figure, is briefly given in Dr. Honigberger's *Thirty-five Years in the East* (Lond. 1852, vol. ii. pp. 305-6), where we read that *Manna teeghul*, or *Shukure teeghal*, which are certain insect-nests of a hard texture, rough on the outside, smooth within, about half an inch in length, and of a whitish colour, are imported into Lahore from Hindostan.

M. Bourlier.

M. Bourlier published in 1857 an interesting note on the same substance,[2] which has been followed by M. Guibourt's communication to the Académie des Sciences, and still later by a memoir on the chemical history of Tréhala by M. Marcellin Berthelot, also presented to the Academy.[3]

M. Guibourt.

From the investigations of M. Guibourt, it appears that the cocoons are composed of a large proportion of starch (identical with that found in the stem of the *Echinops*, upon which the insect forms its nest), of gum, a peculiar saccharine matter, a bitter principle, besides earthy and alkaline salts.

[1] This saccharine substance is noticed by Avicenna as *Zuccarum alhusar* (Lib. ii. Tract. ii. cap. 756, ed. Valgr. Venet. 1564), and also by Matthiolus (Comm. in Lib. ii. Diosc. cap. 75). It is likewise referred to by Endlicher (*Enchiridion Botanicum*, p. 300), Royle (*Illustr. of the Bot. of the Himalayan Mountains*, vol. i. p 275), Mérat and De Lens (*Dict. de Matière Médicale*, t. i. p. 467), &c.

[2] *Revue Pharmaceutique de* 1856, par Dorvault, p. 37.

[3] *Comptes Rendus*, 28 Juin 1858, p. 1276.

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The saccharine principle, which has been especially examined by M. Berthelot, and named by him *Tréhalose*, is a body analogous to cane-sugar, but possessing distinctive properties, which separate it from that and all other varieties of sugar. M. Berthelot.

M. Bourlier states that *Tréhala*, which is abundant in the shops of the Jew drug-dealers of Constantinople, is frequently used by the Arab and Turkish physicians in the form of a decoction, which is regarded by them as of peculiar efficacy in diseases of the respiratory organs. *Tréhala* Abundant in Constantinople.

The second insect-product to which I would draw attention, is a saccharine substance resembling dark honey. Mr. Loftus, who obtained it near Kirrind, 13th July, 1851, and whose specimen is in the British Museum, states that it is exuded from a species of thistle when pierced by a Rhynchophorous insect; but he fails to inform us for what purposes it is used by the inhabitants. II. Product.

Mr. Loftus having also presented the Museum with excellent specimens both of the plant and insect, I am able to state that the former is *Echinops persicus*, Fisch., and the latter a new species of *Larinus*, to which M. Jekel has applied the name *Larinus mellificus*, and of which he has drawn up the following description:— *Echinops persicus* and *Larinus mellificus*.

"LARINUS MELLIFICUS, *Jekel* (Fig. 3). Breviter ovatus, convexus, niger, nitidus; infra subtiliter, lateribus thoracis margineque elytrorum intus medio versus angulariter ampliata, apicem occupante griseo-cinerascenti tomentosis; rostro leviter punctato, basi utrinque bicanaliculato cum elevatione media lata subcariniformi; thorace subconico antice tubulato, supra confertim sat rude punctato, lateribus subrugoso; elytris striato-punctatis, interstitiis latis, planis, transversim subtilissime rugulosis, cum abdomine tenuissime alutaceis, punctis majoribus remotioribus impressis; pectore, lateribus, pedibusque rugoso-punctatis, femoribus infra fortiter oblique costato-rugosis; tibiis intus, anticis fortius crenulatis. Long. (rostr. excl.) 16-18, lat. elytr. 8-9 mill.

"Patria—Persia, prope Kirrind, ubi *Echinopsidis* speciem frequentat, cujus plantæ caules ab hoc insecto puncti materiam quamdam saccharinam sudant." *W. K. Loftus*, Mus. Brit.

1859. Very similar to *L. Onopordinis*, but proportionably more elongate and less convex; rostrum and thorax longer; pilosity of the body underneath much thinner and shorter: thighs thicker, more clavate, the anterior evidently costate-rugose underneath; without whitish marks on the elytra, and without that layer of light-brown earth-like pollinose transudation which is often wanting in rubbed specimens of *Larinus Onopordinis*. The freshest specimens have the griseous margin of the elytra, which parts from the base under the shoulder, obliquely and angularly ampliate interiorly towards the middle, where it reaches the second stria. This griseous pilosity fills all the tips of the elytra, leaving bare only the sutures, an angular notch behind the middle (which forms with that apical part of the suture a kind of hook on each elytron), and two round spots, one submarginal fronting the tip of the notch, the other larger, discoidal, behind the foot of the notch, much above the tip. [*N. Repert. f. Pharm.* viii. 535.]

ON OTTO OF ROSE.

(*Rosenöl.*)

1859. THE importance of authentic specimens is well understood by naturalists. The botanist, who has had the opportunity of verifying the Linnean name of a plant by comparing it with Linnæus's own specimen, is sensible that no more satisfactory proof is wanting. The entomologist who can appeal to the specimens of Fabricius, or the zoologist who can point to those named by Cuvier as identical with his own, feels that he can rightfully adopt the names given by those authors. Nor is the student of Materia Medica much less in need of authentic or type specimens as standards of comparison. Yet how difficult it would be to point to a specimen of Sarsaparilla as indubitably the root of one particular species of *Smilax*, or to find in our museums a specimen of myrrh or olibanum, or gamboge, with indisputable data as to its botanical origin and place of production.

Importance of authentic specimens.

1859.

Price of Otto.

These observations have been suggested by the difficulty which occurs to the druggist in the purchase of Otto of Rose. The wholesale price of the article varies from 14*s.* to 26*s.* per ounce, a fact indicative of a wide range of qualities. But assuming that the most expensive article is the purest, it will be found to differ materially from the Otto described by our best authors. Pereira states[1] that at temperatures below 80° F., Attar of Roses is a crystalline solid; and the same assertion is made by Dr. Royle.[2] Brande states[3] that it melts at 84°; Redwood, that it fuses between 84° and 86°.[4] Martiny gives 86° as its fusing point.[5] Chevallier, Richard, and Guillemin say that it is concrete below 84° to 86°.[6] Dr. Jackson states, of the Otto made at Ghazeepore, that it melts at 84°.[7]

Fusing point.

Yet the Otto of the London market, as all druggists know, is never found with so high a fusing-point, and, in fact, there is but a portion of that which arrives, of which one could say that it is solid above 60° F.

These discrepant facts have long engaged my attention, and believing that the general subject of Otto of Rose merits the notice of pharmacists, I have placed on paper the observations which I have collected.

For convenience I think it best to discuss the subject under three heads, namely, *Production*, *Adulteration*, and *Chemical Characters*. First, then, the

Production of Otto of Rose.

Production.

The Otto of Rose with which at the present day the English market is supplied, is produced in Turkey, on the plains lying south of the Balkan mountains.

[1] *Elements of Mat. Med.* Ed. 3, vol. ii., p. 1812.
[2] *Manual of Mat. Med.* Ed. 2, p. 432.
[3] *Manual of Chemistry.* Ed. 6, p. 1551.
[4] *Supplement to the Pharm.* Ed. 3, p. 861.
[5] *Encyklop. d. Med.-Pharm. Nat.-und Rohwaarenk.* Bd. ii., p. 389.
[6] *Dict. des Drog.* T. iii., p. 158.
[7] O'Shaughnessy's *Bengal Dispensatory* (p. 328), in which work Dr. Jackson's interesting account is given at length.

1859. Otto of Rose is also collected in Provence, in the South of France, by the distillers of rose water, and this Otto, the production of which is very limited, realizes a large price. In the state of Tunis, in Persia, and in the northern parts of India,[1] Otto of Rose is also manufactured, but none from these countries finds its way into the London market.

Turkish Otto. With regard to Turkey, the chief localities in which the rose is cultivated for the production of Otto, are Kizanlik, a large town lying on the southern side of the Balkans, about seventy miles to the north of Adrianople. At Eski-Zaghra, in the valley of the Tunja, to the south-east of Kizanlik, the rose is also cultivated on a large scale, and at Carlova;[2] also on the southern side of the Balkans, and about 100 miles from Adrianople much Otto is said to be produced.

The flowering season commences in May and the roses are usually collected before sunrise every morning. When the weather is dry and hot, the flowering season is short, and the roses blooming about the same time, it is impossible to collect them all.

The process followed is the simple one of distilling the roses with water in copper stills of no very considerable dimensions, and collecting the Otto from the distilled product.

Collection of Otto.

In very favourable seasons, the three districts above mentioned can produce from 300,000 to 360,000 *meticals*, which, at six *meticals* to the ounce, would give from 50,000 to 60,000 ounces. This, however, is of rare occurrence, as, independently of hot weather, other causes, as frost, or caterpillars, may reduce the crop.

I am informed that in the year 1854, the crop in the three districts above named though not abundant was calculated at 250,000 *meticals*, equal to 41,666, ounces; in the year 1855 it

[1] Ghazeepore on the Ganges is famous for its manufacture of Rose Water and Otto of Rose. The latter I would willingly have examined, but have been unable to obtain a specimen, or, in fact, of any Indian Otto of Rose in a state of purity.

Tunisian Otto of Rose, valued at an enormous price, was sent to the Great Exhibition of 1851, but I had no opportunity of obtaining a sample.

[2] Sometimes spelt *Carloya*, but I cannot find it under either name, even upon the best maps.

1859.

was estimated at 30,000 ounces; while in 1856 it did not much exceed 13,000 ounces.

The Otto of Rose is transported from the producing districts in large, flat, tin bottles, covered with thick, white felt, and bearing a calico label inscribed with Turkish character. By the dealers at Constantinople it is transferred to cut and gilt glass bottles imported from Germany, and in these it usually finds its way to the markets of Europe. Sometimes, however, the large tin bottles are imported into London, it being supposed (and with some reason) that the Otto they contain has escaped being tampered with at Constantinople.

Otto in tin bottles.

According to the official returns prepared for the Board of Trade the quantities of Otto of Rose imported into the United Kingdom upon which duty was paid, were, during four years, as under:—

1854 . . .	1251 lbs.,	equal to	20,016 ounces.
1855 . . .	1012 „	„	16,192 „
1856 . . .	1522 „	„	24,352 „
1857 . . .	1591 „	„	25,456 „

The duty is one shilling per pound.

Adulteration of Otto of Rose.

Adulteration with Spermaceti.

Although in Turkey the adulteration of Otto of Rose is sometimes practised by the producers, and especially of late years, since the repeal of a law in 1840 or 1841, prohibiting such adulteration under pain of death,[1] it is chiefly at Constantinople that this fraudulent practice takes place.

Among the substances which have been used for the adulteration of Otto of Rose, I may mention two as specially deserving attention. The first is spermaceti, which, in Turkey, is, I am assured, frequently mixed with the cheaper qualities of Otto; the second, which is far more systematically and extensively employed, as well as more difficult of detection, is an essential oil, called in Turkish, *Idris Yaghi*.[2] It is not unfrequently

[1] I give this upon the authority of Mr. Edward Schnell, of Adrianople, to whom, through my friend Mr. Maltass, I am indebted for other particulars respecting the production of Otto of Rose in the Balkan.

[2] I have taken some pains to discover the signification of this name, but without much success. My friend Mr. Redhouse, thinks it is عصرس یاغی

1859. imported into London from Turkey, and is then known in the London drug trade as *Turkish Essence of Geranium.*

Origin of Idris Oil.

Let us consider what is its origin. The *Catalogue of the Turkish Section of the Great Exhibition of* 1851 states that it is brought from Mecca. A sample presented by M. Della Sudda to the École de Pharmacie of Paris, has likewise this origin assigned to it,[1] I am, moreover, informed by my friend Mr. Maltass, that the Idris oil found at Smyrna is all brought by the pilgrims arriving from Mecca. M. Guibourt has stated to me upon the authority of a gentleman at Constantinople, that the dealers there affirm that the oil in question comes from India by way of Egypt.

Although it is thus tolerably evident that the essential oil called *Idris Yaghi* is imported from Mecca, or perhaps from Jeddah, the port of Mecca, all that we know of these places tends to show that it is not produced there. Mecca appears to have no manufactures, but to be entirely supported by the pilgrims who flock to its holy places: besides which, the nature of the country and the climate utterly forbid the idea of a green herb being produced in quantity for distillation.

Jeddah a trading not a manufacturing place.

Jeddah is also without manufactures, but it has a large trade with various ports on the Red Sea, as well as with India. Burckhardt, who visited it in 1814, has left a minute description of the various trades carried on, and even the number of persons engaged in each; and it is perfectly clear from his account, that even for the most trifling manufactured articles, Jeddah is dependent either on Egypt or India.[2]

From Bombay, on the other hand, an essential oil is exported, which is *undistinguishable* from the Turkish Essence of

Idris yaghi, which may signify *marsh-mallow oil:* and as there is a word in Turkish (ابەكومجى *Ébé-gumèji*) which is used to denote both the marsh-mallow and one of the common garden geraniums, so it is possible that the Arabic عضرس *idris* may have the same double signification:—though the application of any term signifying *geranium* to the essential oil in question, is, as I shall show, only correct in so far as that there is a similarity of odour.

[1] *Journal de Pharm. et de Chimie.* Tome xxix., p. 310.

[2] *Travels in Arabia*, Lond. 1829, 4to, p. 41, &c.

Geranium.[1] This liquid is known in India as *Roshé* or *Rosé* Oil,[2] and in the London market as *Oil of Ginger-Grass* or of *Geranium*. It is the produce of the more northern parts of India, where it is obtained by the distillation of certain grasses of the genus *Andropogon*, but the precise species of which I am at present unable from personal knowledge to name. **1859.** Roshé Oil from Bombay.

From the *Report of the External Commerce of Bombay* for the year 1856-7, a valuable mass of statistics, compiled by R. Spooner, Esq., Reporter-General, and published by authority of Government, I find that *Roshé* (or *Rosia*) *Oil* was exported from Bombay during the year in question to the extent of 1922 gallons. Of this enormous quantity, 541 gallons were shipped to England, and the remaining 1381 gallons to the Arabian Gulf. The *Report* does not state to what ports in the Arabian Gulf this quantity of Roshé Oil is shipped; but as none is reported as shipped to Aden or Suez (for which places, as for the United Kingdom or France, there are special returns), it is plain that it is shipped to other ports than these.

Now, although there are several other ports in the Arabian Gulf, it is Jeddah, the port of Mecca, that stands foremost in importance. To quote a competent authority:[3] "From its position, it is the *entrepôt* of all goods coming from India and Egypt. The merchants of Cosseir, Yambo, Hodeyda and Massowah draw their supply from it." According to Burton, the value of the import trade of Jeddah with India amounts to about 25 *lacs* of rupees (£250,000) annually.[4] Import trade of Jeddah.

Coupling these facts with the testimony of the Turks, that the volatile oil called *Idris Yaghi* is imported from Mecca, and still more with M. Guibourt's information that it is brought from India, I think there is good circumstantial evidence for

[1] I must, however, admit that in English trade-lists the two are separately enumerated, the Turkish fetching a higher price.

[2] This orthography, Professor H. H. Wilson informs me, is the most correct, the word being Maráthí, and written रोसे. (*Vide* Molesworth's *Marathi and English Dictionary*, 2nd. ed., Bombay, 1857). It is, however, often spelt *Rosa*, *Rosia*, *Rowsah* or *Reosa*.

[3] R. Innes, Esq., of Cairo, quoted in Parkyn's *Life in Abyssinia*, vol. i. p. 402.

[4] *Pilgrimage to El-Medinah and Meccah*, vol. iii. p. 379.

1859. identifying it with the *Roshé Oil* that is imported from Bombay; and when we consider the immense influx of pilgrims every year to Jeddah, the transport of the drug northward to Egypt and Turkey is easily explained.

Although I have thus demonstrated (as I think) the identity of the Turkish *Idris Yaghi* with the *Roshé Oil* of Bombay, and therefore proved them the produce of one or more species of *Andropogon*, growing in India, it may be proper that I should briefly state other reasons for considering that this volatile oil has no claim to the name often given to it of *Essence of Geranium*. I may say, then, that it differs from true essential Oil of Geranium, such as is distilled from a variety of *Pelargonium Radula*, Ait., in the South of France.

Idris Oil not true Essential Oil of Geranium.

1. In odour.

2. In optical properties, in having (according to the observations of my friend Dr. De Vry) no rotatory power when examined by polarised light, whereas, French Oil of Geranium possesses the power of right-handed rotation.[1]

3. In chemical properties, inasmuch as when exposed to the vapour of iodine, it does not acquire the intense coloration that occurs when Oil of Geranium is so treated.

4. In commercial value, true Oil of Geranium being worth six times the price of *Idris Yaghi*, and ten times that of the Bombay Roshé Oil.

Before being mixed with Otto, the *Idris Yaghi* is subjected by the Turkish dealers to some purifying process, chiefly, it would seem, with a view to diminish its colour, a pale colour in Otto of Rose being deemed a sign of goodness.

Chemical Characters of Otto of Rose.

As I have already observed, there exists regarding the temperature at which Otto of Rose liquefies, great discrepancy between the statements of authors and the result of observations made upon the Otto of commerce.

[1] But, as some essence of geranium from Algiers, examined by the same observer, was found to have the power of *left-handed* rotation to an almost equal extent, it is obviously *possible* that by mixing the two, an essence having *no* rotatory power might be produced—an improbable explanation,

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Elæoptene and Stearoptene.

Otto of Rose, it is well known, consists of two bodies, a liquid essential oil or elæoptene (upon which I have made no experiments) and a stearoptene. The stearoptene I find to be, when pure, a colourless crystallizable substance, devoid of odour and taste, fusing at 95° F., very slightly soluble in alcohol of sp. gr. ·838 in the cold, but more soluble if heated. It is soluble in the liquid portion or elæoptene of Otto of Rose, but, according to its abundance, separates more or less readily with a depression of temperature. It dissolves readily in ether, chloroform, or olive oil, but not in solution of potash or ammonia.

These two bodies, the elæoptene and stearoptene, exist, according to my observations, in the Otto of different districts in very different proportions, and to their relative amounts I attribute much of the variation which I find in the specimens examined. The amount of stearoptene was determined in a series of parallel experiments, conducted simultaneously by treating a given weight of Otto with alcohol (sp. gr. ·838), throwing the precipitated stearoptene upon a filter and thoroughly washing it with fresh alcohol; the same amount of alcohol being employed in each case. The stearoptene was then pressed for some days between paper, and after exposure to the air and drying over oil of vitriol, was weighed.[1] The fusing-point was determined in each case by the same thermometer placed by the side of the bottle, and the observations were confirmed by repeated trials.

Determination of Stearoptene.

The English and French samples experimented upon were obtained direct from the manufacturers, and mostly upon my personal application. The Turkish sample No. 7 was manufactured at Kizanlik, where Messrs. Herman, from whom I received it, have an establishment.

certainly, of the absence of rotatory power in the *Idris Yaghi*, but one which it is fair to mention.

[1] I am quite aware that this method of determining the amount of stearoptene is not free from objection, since, the more abundant the elæoptene, the less will the stearoptene (in which it is soluble) be precipitated when the Otto is first treated with alcohol.

1859. The results I have tabulated as under :—

TABLE SHOWING THE RESULTS OF A COMPARATIVE EXAMINATION OF TWELVE SAMPLES OF OTTO OF ROSE.

No.	Place of Manufacture, and Manufacturer's Name.	Fusing Point.	Percentage of Stearoptene.	Other Characters.
	ENGLISH.			
1	London—Messrs. Allen and Hanbury's.	91° F.	68·1	Of a pale straw colour, crystalline, odour weak and not remarkably fragrant.
2	London—Mr. Whipple, at Messrs. Barron and Co's.	87° F.	50·6	Resembles No. 1.
	FRENCH.			
3	Paris—M. Chardin Hadancourt.	85·5° F.	60·8	A crystalline mass, of a pale green colour; odour weak but agreeable.
4	Grasse — M. Antoine Chiris.	74° F.	37·2	Of a straw colour; when congealed, forming a highly crystalline mass; odour very fragrant.
5	Grasse—M. Mero.	71° F.	41·9	Of a brownish yellow; forming, when congealed, a transparent mass of platy crystals.
6	Cannes—MM. Herman Frères.	70° F.	35·0	Resembles No. 4.
	TURKISH.			
7	Kizanlik.	65° F.	6·7	Colour very pale yellow; when congealed, it constitutes a confused mass of platy crystals; odour exceedingly fragrant.
8	? seal G. S. & Co.	63° F.	7·3	Colour very pale yellow; a mass of platy crystals when congealed.
9	?	62° F.	6·4	Resembles No. 8.
10	?	62° F.	6·6	The finest Otto of the London market. In its characters it resembles No. 8.
11	?	61° F.	4·6	Resembles No. 8.
12	? second quality.	56° F.	4·25	Wholesale price in London, in large quantities, 14s. per ounce.

This table shows that the fusing-point of Otto of Rose, and the proportion of stearoptene varies greatly in different samples. But it will also be observed that there is a similarity in the Otto produced in each locality. Thus, that of the South of England and North of France (samples Nos. 1, 2, and 3) has a high fusing-point (varying from 85° to 91°), and contains a large percentage (50 to 68) of stearoptene. The Otto of the South of France fuses betwen 70° and 74°, and affords from 35 to 41 per cent. of stearoptene. That of Turkey, if we may consider

Variation of fusing-point.

samples Nos. 8, 9, and 10 as equally genuine with No. 7 (Messrs. Herman's), fuses at from 65° to 62°, and affords from 7·3 to 6·4 per cent. of stearoptene.[1] Sample No. 11 may be regarded with some suspicion from its resemblance to No. 12—the latter being acknowledged of inferior quality. 1859.

Whether the differences that exist in the characters of the various kinds of Otto are the result of climate or of the method of manufacture, or whether (especially in the case of the Turkish Otto) they are to be traced to a difference in the species of rose are questions for determining which I have at present no sufficient data. [*N. Repert. f. Pharm.* viii. 365.]

BOTANICAL AND PHARMACOLOGICAL INQUIRIES AND DESIDERATA.[2]

(*Botanisch-pharmacognostische Aufgaben.*)

BY SIR WILLIAM J. HOOKER, assisted by DANIEL HANBURY.

AFRICA—WEST COAST, ALSO EAST COAST, INCLUDING THE RED SEA AND ARABIA.

COPAL.—Information is much desired respecting the varieties of this substance which are found in commerce, and which are exported from the West Coast of Afria. Some copal is believed to be dug from the ground, but one variety at least is collected from the tree. This is the Sierra Leone copal, and is produced by *Guibourtia copallifera*, Bennett—*Kobo* of the natives: specimens of this tree, including the ripe pods, are requested: it grows at Goderich and in other localities near Sierra Leone. 1859.

GRAINS OF PARADISE.—Although *Amomum Melegueta*, Roscoe, the plant which yields this drug, is now well known, there are some other interesting species nearly allied, with which botanists

[1] The test used in Turkey by the persons who purchase Otto from the producers, is to plunge a small vial of it into water at 10° Réaumur (= 55° F.). If, in the space of five minutes the Otto congeals, it is regarded as genuine.

[2] Extracted from the *Admiralty Manual of Scientific Inquiry*. Third edition, 1859.

1859. are very imperfectly acquainted. It is, therefore, desirable to procure specimens of such plants from various parts of the West Coast of Africa. These specimens should comprise the flowers and fruits, as well as the foliage. As the flowers are very delicate, it is necessary to preserve some specimens in spirit of wine or in dilute acetic acid. Some specimens of the fruits should also be preserved in the same manner. As the specimens often grow intermixed, and as flowers and fruits are produced at different seasons, special care is requisite to avoid confusion.

KORARIMA CARDAMOM is the name under which the late Dr. Pereira has described an Abyssinian cardamom, having the shape and size of a small fig, which is exported from Mussowah, a port at the southern end of the Red Sea. This drug, which has long been known in medicine, is perforated at the smaller end, and when strung upon a cord, is commonly used by the Arabs and Abyssinians as beads for their *mesbehas* or rosaries. It is said to be brought to the market of Baso in Southern Abyssinia from Tumhé, a country situated in about 9° N. lat. and 35° E. lon. The plant for which the name *Amomum Korarima* has been proposed is entirely unknown.

OLIBANUM.—The Olibanum found in European commerce is believed to be produced partly on the African coast near Cape Gardafui, and partly on the southern coast of Arabia, whence it is shipped to Bombay.

Olibanum is also produced in India by certain species of *Boswellia* called *Salai* or *Saleh*, one of which is *B. glabra*, Roxb., another *B. thurifera*, Colebr. It is extremely doubtful if the Olibanum afforded in India by these trees finds its way to Europe, but information on this point is desired.

African Olibanum is yielded by a tree called *Plösslea floribunda*, Endl. (*Boswellia*, Royle); but as the drug varies considerably in appearance, it is highly probable that it is obtained from more than one species. The variety called *Lubân Mattee*, from its being shipped at Bunder Mattee, is, for instance, a very different drug from ordinary Olibanum. A resident at Aden may be able

to gather some information upon this subject, as well as upon the next.

MYRRH.—This celebrated drug is collected in great quantities by the Somali tribes on the African coast, near the southern extremity of the Red Sea, whence it is brought to Aden for shipment to Bombay. A variety of myrrh, which is probably yielded by another species, is also produced (according to Vaughan) in a district lying forty miles to the east of Aden, to which place it is brought for sale. A third variety, distinguished by the Arabs as *Bissa Böl*, is also collected by the Somali tribes, and sent by way of Aden to India. It is a point of much interest to determine with accuracy the plants which afford these several sorts of myrrh, and for this end it is earnestly requested that those who have any opportunity for investigating the subject will not neglect to do so.

ASIA MINOR, PERSIA, CENTRAL ASIA.

GUM TRAGACANTH is produced in Asia Minor by several species of *Astragalus*, which it is desirable further to identify. Travellers and others who have the opportunity should preserve specimens of any species *seen* to yield the gum, as well as specimens of the gum itself; noting at the same time whether the latter was obtained from incision in the stem, or whether exuded spontaneously. Fine gum tragacanth is produced at Caissar (or Kaisarieh) and Yalavatz, in Asia Minor, at which places the practice of making longitudinal incisions in the stem of the shrub is adopted; the gum is also collected at Isbarta, Bourda, Angora, &c.

Gum tragacanth is frequently adulterated with another gum, which has been called *False Tragacanth*, *Hog Gum*, *Bassora Gum*, or *Gum Kutera*. At Smyrna it appears to be known as *Caraman Gum*. What is its origin? One of its properties is to swell up into an opaque mass upon being placed in water, in which, however, it does not dissolve.

STORAX.—None of the Storax found in commerce in modern times is derived from *Styrax officinale*, L.; yet it is certain that

1859. this tree is capable, under favourable circumstances, of yielding a highly fragrant resin which was once much valued. Authentic specimens of this resin, which is the original and legitimate *Storax*, are much desired. It was formerly produced in the south of Asia Minor, where the tree is still found in great abundance.

SALEP.—Obtain specimens of the different plants which yield salep in Asia Minor, Persia, and Cashmere, and especially of those that afford the best kinds. What is the plant which affords the drug called *Badshah Saleb*, or Royal Salep? Where is it produced, and for what purpose is it valued? It has been exported to England from Bombay.

SUMBUL ROOT.—Nothing definite is known respecting the botanical origin of this remarkable root, which is said to come into Europe by way of Russia. It is probably produced somewhere in Central Asia.

ASSAFŒTIDA.—Although the ordinary assafœtida of commerce is doubtless the produce of *Narthex Assafœtida*, Falc., there are some varieties of the drug which, it is reasonable to conclude, are derived from other species. One of those sent from India to the Great Exhibition of 1851 was a brown pellucid gum resin, containing pieces of the stalk of the plant, and differing considerably from ordinary assafœtida.

Another variety, which has long been known, has been called *Stony Assafœtida*, from its containing about 50 per cent. of gypsum, an addition which, in the case of so cheap a drug, it is difficult to understand. Assafœtida is produced in Persia, and reaches Europe by way of Bombay.

SAGAPENUM, a gum-resin resembling assafœtida, but not acquiring a pink colour upon exposure to the air, and of not so strong an alliaceous odour. As it is occasionally shipped from Bombay, it is presumed that it is produced in Persia. Though it has been used in medicine for ages, its botanical origin is not ascertained; from analogy, however, we may infer that it is the produce of some large plant of the Nat. order *Umbelliferæ*.

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Compared with assafœtida and galbanum, sagapenum is a rare and costly drug.

GALBANUM.—The remarks we have made upon sagapenum apply to a great extent to the gum-resin known as *Galbanum*. Galbanum is, however, a far more abundant substance than sagapenum. It occurs in trade in two varieties, which are so distinct as to lead to the inference that they are yielded by distinct plants. Galbanum is said to be imported into Russia in large quantities by way of Astrachan, but that which reaches England comes principally from Bombay.

OPOPANAX, another fœtid gum-resin, the produce, according to most authorities, of *Opopanax Chironium*, Koch, a large umbelliferous plant, native of the south of Europe, and of Asia Minor. There is no modern account of the collection of this drug, nor is its place of production ascertained.

RHUBARB.—Determine the true source of the various sorts of *medicinal* rhubarb, especially of the Chinese rhubarb sold at Kiachta to the Russians, and of that exported from Canton. Strange to say, we are still in the dark respecting the real origin of this most valuable drug! In this and all such cases the drug should be procured by one who is an eye-witness to it being gathered, and specimens of the foliage, flowers, and fruit, carefully dried for the herbarium on the spot, should accompany it.

INDIA, SIAM, INDIAN ARCHIPELAGO, CHINA, &c.

CATECHU.—Observe the processes by which the various kinds of *Catechu*, *Cutch*, *Terra Japonica*, and *Gambir* are obtained; and if from trees, whether from others besides *Acacia Catechu*, *Areca Catechu*, and *Uncaria Gambir*. We wish to identify the trees with the respective extracts.

GRASS OILS.—The grasses used in India for affording the fragrant essential oils known as *Lemon-grass Oil* or *Essence of Verbena*, *Ginger-grass Oil*, *Citronelle*, &c., require investigation. What, for instance, is the source of the essential oil imported from Ceylon as *Oil of Lemon-grass?* It is considered quite distinct from *Citronelle*, which is also a production of the island.

1859. Benzoin or Gum Benjamin.—Obtain complete specimens of the tree which affords this drug in Siam.

Cardamoms.—The so-called *Wild* or *Bastard Cardamom* of Siam is produced by *Amomum xanthioides*, Wallich, a plant of which *complete* and *well-preserved* specimens are requested, in order that it may be described and figured. The seeds *per se* have been imported into England, while the empty capsules are found in the drug-shops of China. Are the latter exported from Siam to China?

What is the origin of the cardamom called by the Chinese *Yang-chun-sha*, the *Hairy China Cardamom* of pharmacologists? It is said to be produced in the province of Kwang-tung, and it may be a native of Cochin China.

Nothing is known of the origin of the scitamineous fruit to which the name *Large Round China Cardamom* has been given, and which is known to the Chinese as *Tsaou-kow*. The same remark applies to the *Bitter-seeded Cardamom*, *Yǐh-che-tsze*, and *Ovoid China Cardamom*, *Tsaou-Kwo* or *Quâ-leu*; it is probable that all of them are productions of the south of China, or of Cochin-China.

Cassia Bark.—Specimens are much desired of the tree which affords this bark in Java, on the Malabar coast, in the south of China, and in Cochin-China. Botanical specimens should in all instances include good samples of the bark, young and old, obtained from the same tree.

Cassia Buds.—These are the immature fruits of a *Cinnamomum*, native of Cochin-China, specimens of which are requested.

An inferior kind of Cassia Buds, known as *Lovengoopoo*, is found at Madras. What is the species that affords it?

Aromatic Barks of other *Laurineæ*, as *Culitlawang*, *Massoy*, *Sintoc*, are objects of commerce in the Indian Archipelago, and are but imperfectly known in Europe. The traveller should embrace the opportunity, when it occurs, of seeing the bark collected, and of obtaining authentic specimens of it, and of

the tree yielding it. Massoy Bark is produced on the west coast of New Guinea. 1859.

GALANGAL ROOT.—Endeavour to procure the plant affording this drug, which is imported from the south of China.

ELEMI.—This resin is abundantly produced in the forests of the Philippines, where it often assists in giving a cheerful blaze to the fire of the traveller. It is also exported from Manilla as a drug. The tree that affords it is probably a *Canarium*, but it is desirable to have complete specimens, in order to ascertain the species with exactness. Elemi is also produced in Mexico, where it is known as *Copal*. It occurs in commerce in scraped pieces, which are semi-cylindrical, yellowish, semi-opaque, and having the usual strong and fragrant odour of Elemi. This drug is the produce of *Elaphrium elemiferum*, Royle, a tree occurring near Oaxaca, of which specimens are requested in order that it may be further examined and described. There are other resins, of whose origin little is known, which have been imported from Mexico, Brazil, and other parts of tropical America as *Elemi*.

CENTRAL AND SOUTH AMERICA.

SARSAPARILLA.—The species of *Smilax*, the roots of which constitute the various sorts of sarsaparilla found in commerce, are very imperfectly known. Good botanical specimens, comprising flowers, fruits, and leaves, and accompanied by the stem and roots, should be carefully preserved, and transmitted to England for determination. The so-called *Jamaica Sarsaparilla* grows near the Chiriqui Lagoon, in the state of Costa Rica, and a species very similar, if not identical with it, at Bajorque, on the Rio Magdalena, New Granada. Other sorts of sarsaparilla are produced in Mexico, Guatemala, Honduras, Brazil, &c. That of Guatemala grows in the department of Sacatepeques in that state.

RHATANY ROOT.—A variety of this drug has been exported of late years from Savanilla, in New Granada. Obtain specimens of the plant from which it is derived.

1859. MALAMBO BARK, a highly aromatic bark, produced in New Granada. Of its origin nothing certain is known.

BALSAM OF COPAIVA is imported from several parts of Brazil; it varies somewhat in properties, and is the produce of several species of the genus *Copaifera*. It is desirable to obtain the balsam of each species, with a specimen in flower and leaf, and, if possible, in fruit, of the tree affording it, and the name of the district where the tree grows, and its native appellation there.

LIGNALOE.—The name of a remarkably aromatic wood sent to the Paris Exhibition of 1855, from the department of Vera Cruz in Mexico. By what tree is it afforded?

LIGNUM NEPHRITICUM.—This rare wood was sent to the Paris Exhibition of 1855 from Mexico. To what tree is it to be referred?

CINCHONA BARK, or PERUVIAN BARK.—This valuable drug, the only source of quinine, is derived from various species of *Cinchona* growing along the whole chain of the Andes, from New Granada to Bolivia. Of these trees it may be said that good, pressed, botanical specimens of *any* species are interesting and desirable. Such specimens ought to include the flowers and fruits, and in every case to be accompanied by several pieces of the bark, young and old, stripped from the *very* tree from which the botanical specimens were gathered: all being most carefully and clearly labelled upon the spot with every particular worthy of note.

A point of considerable interest, still to be determined, is the *proportion* of alkaloids contained in the *young* and *old* bark. For this determination two or three pounds of each sort of bark are requisite; and for a perfectly fair experiment they ought to be collected from the same individual tree.

The attention of Englishmen residing in the countries indicated is especially requested to this by no means unimportant question.

BALSAM OF PERU.—The drug known under this designation is produced, not in Peru, but in Central America, in a district

1859.

lying between Acajutla and Port Libertad, in the western part of the state of San Salvador, known as the *Balsam Coast*. The tree which affords it may also be found at Ispanguasate (where it has been planted), and near Chiquimulilla, and on the coast of Suchultepeques. Of this tree, which is the *Myrospermum Pereiræ* of Royle, good flowering specimens are much desired, as are also fresh seeds, in order that the plant may be raised in our hot-houses. The seeds should be transmitted by post, as their vitality is not long retained. The balsam, which is called *Balsamo negro*, is brought for sale to Sonsonate, previously to shipment at Acajutla.

Although the plant above mentioned is undoubtedly that which affords the balsam of Peru of commerce, yet there is reason to think that a balsam of similar character was formerly extracted from other species. Monardes (1565) states that balsam of Peru is *lighter* than water, but the balsam of modern times is *heavier*. Inquire into this. Is not balsam prepared at Chongon, near Guayaquil? Is any produced in Mexico? We have received the seeds of a *Myrospermum* from that country.

Balsam of Tolu.—*Myroxylon Toluifera*, H. B. K., the tree which affords this substance, is very imperfectly known. It grows in New Granada, in the neighbourhood of Turbaco, and especially in the high savannas near Tolu, Corozol, and the town of Tacasuan. It is also found at the mouth of the river Sinu, near El Zapote, and here and there on the banks of the Rio Magdalena, in the environs of Garapatas and Mompox.

Is it not possible to obtain at least the seeds, not to mention a supply of good botanical specimens, of this famous tree, and some account of the extraction of, and trade in, the balsam it affords?

* * * * * *

On Preserving Plants for the Herbarium.

This is by no means the difficult process which many have imagined. The object is to prepare the specimens in such a manner that their moisture may be *quickly absorbed*, the colours,

1859. so far as possible, preserved, and such a degree of pressure imparted that they may not shrivel in drying.

For these purposes, provide a quantity of paper of moderate folio size and rather absorbent quality—brown or stout grey paper answers the purpose exceedingly well. An excellent kind, when not to be used in a hot and moist country, is *Bentall's botanical paper*, 16 inches by 10, which costs (folded) 15*s.* a ream; or of larger size, namely, 20 inches by 12, 21*s.* per ream. It is sold by Newman, No. 9, Devonshire Street, Bishopsgate Street, London. In a hot and moist region, brown paper may be employed with advantage. Two boards are requisite, of the same size as the paper, or a trifle larger, one for the top, the other for the bottom, of the mass of papers. Some pieces of millboard placed between the specimens, if these are numerous or particularly thick and woody, are very useful. For pressure nothing is better than a heavy weight on the topmost board, or, while travelling, three leathern straps and buckles, two to bind the boards transversely, and one longitudinally. Thus provided, gather your specimens, if the plant be small, root and stem; if large, take off portions of the branches, a foot or rather more in length, always selecting those which are slender and in flower, or in a more or less advanced state of fruit. Long slender plants, as *grasses*, *sedges*, and many *ferns*, may be doubled once or twice. Place them, as quickly after being gathered as you can, side by side, but never put one upon the other, on the same sheet of paper, taking care that one part of the bundle be not materially thicker than the other; and lay over the specimens one, two, three, or more sheets of paper, according to the thickness of your paper and of your plants; and so on, layer above layer of paper and specimens, and subject the whole to pressure. In a day or two, according to the more or less succulent nature of the plants and the heat and dryness of the climate, remove them into fresh papers, twice or oftener, till the moisture be absorbed, and dry the spare papers in the sun or by a fire, for future use.

If the specimens cannot be laid down as soon as gathered, they should be deposited in a tin box, which indeed is essential

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to the botanist when travelling; there they will remain uninjured for a day and night, supposing the box to be well filled and securely closed, to prevent evaporation. Some very succulent plants, and others with fine but rigid leaves—the heath and pine tribe, for example—require to be plunged for an instant into boiling water ere they are pressed. In this case the superabundant moisture must be absorbed by a cloth or by blotting-paper.

When sufficiently dry the specimens should be put into dry papers, one sheet or folio between each; except they are unusually woody (which is the case with oaks and pines), and then more paper must be employed, care being used to distribute the specimens pretty equally over the sheets, and thus a great many may be safely stowed in a small compass. A slip of paper should be placed with each specimen, stating its name, if known, and the date and place of collection. Specimens so arranged are now ready for transport, either packed in boxes or covered with oilcloth.

Mosses and cryptogamous plants may be generally dried in the common way: those which grow in tufts should be separated by the hand to form neat specimens. Seaweeds require a slight washing in fresh water, and common blotting-paper is the best for removing the moisture from this tribe of plants.

It is almost needless to add that *all plants*, whether living or dried, ought to be transmitted to Europe with the least possible delay; the latter, especially in hot or moist climates, are often soon destroyed by the depredations of insects.

1871.

INQUIRIES RELATING TO PHARMACOLOGY AND ECONOMIC BOTANY.

(*Botanische Fragen und Desiderata.*)

BY PROFESSOR OLIVER, AND DANIEL HANBURY.

Extracts from the *Admiralty Manual of Scientific Inquiry.*

Asia Minor, Armenia, and Persia.

Gum Tragacanth, *vide* page 175.

Storax, *vide* page 175.

Salep, *vide* page 176.

Larch Agaric (*Polyporus officinalis*, Fries).—This fungus now comes from Northern Russia, where it grows on the stems of *Larix sibirica*, Ledeb. During the middle ages it was exported from Asia Minor; and in the Paris Exhibition specimens from this region, that is to say, from the Gulf of Adalia, were exhibited. What is the tree from which this Asiatic Agaric is obtained?

Assafœtida, *vide* page 176.

Sagapenum, *vide* page 176.

Galbanum, *vide* page 177.

Opopanax, *vide* page 177.

Africa—West Coast.

Copal, *vide* page 173.

Grains of Paradise, *vide* page 173.

African Turmeric is said to be the rhizome of *Canna speciosa*, Rosc., but further investigation is desirable. Living roots might easily be procured at Sierra Leone, and sent to England for cultivation.

African Mammee (*Ochrocarpus africanus*, Oliv.), native of Sierra Leone and Prince's Island. Specimens of the tree, and (in alcohol) of the fruits, which are as large as an orange, are requested.

1871.

BITTER KOLA of Fernando Po.—The common *Bitter Kola* (*Cola Nuts*), largely used by the natives of West Tropical Africa, is known to be the produce of a wide-spread tree *Cola acuminata*, Br., but the origin of the *Bitter Kola* of Fernando Po is still uncertain. There can be no doubt that it is the seed of a Guttifer (*Garcinia* or *Xanthochymus*), so it must be sought on a tree with strictly opposite leaves; the seeds probably contained in a pulpy fruit.

BALSAM OF ST. THOMAS is the name of a tree growing in the island of St. Thomas, in the Gulf of Guinea. Specimens in flower and fruit, also of the resin, if it afford such, with information as to the mode of procuring it, would be acceptable. It is probably a species of *Sorindeia*.

BITTER WOOD.—A species of *Quassia* (*Q. Africana*, Baill.) is found in the Gaboon and Camaroons rivers. Specimens of the wood are required to show whether it may serve as a substitute for the Tropical American species (*Q. amara*).

What is the Kpokpoka tree of West Tropical Africa, from the fibre of which the "dodo" cloth is prepared? Specimens in flower are wanted.

Specimens in flower or fruit of any shrubs or trees of Upper Guinea, affording elastic gums, *india-rubber* or *gutta-percha*, with accompanying gum and mode of its collection, are particularly requested.

AFRICA—EAST COAST, INCLUDING THE RED SEA, ARABIA, AND MADAGASCAR.

MYRRH, *vide* page 175.

OLIBANUM, *vide* page 174.

KORARIMA CARDAMOM, *vide* page 174.

DRAGON'S BLOOD, of the Island of Socotra—By what plant is it afforded?

CATHA EDULIS, called in Arabic *Kât*. A large supply of the dried leaves of this shrub, say one hundred pounds, should be procured for chemical examination. The plant grows in Southern Arabia and in Abyssinia.

1871. KAMALA.—A peculiar sort of Kamala, evidently not derived from *Rottlera tinctoria*, Roxb., has been imported from Aden. Nothing is known of its place of growth or of the plant by which it is afforded. (PHARM. JOURN. ix. (1868), p. 179.)

KOUSSO.—Fresh seeds of the Kousso tree, *Brayera anthelmintica*, Kunth, should be procured for cultivation.

GUM ARABIC.—*Acacia Verek*, Guill. et Perrott., a tree growing all over the northern part of Central Africa, from Senegambia to Abyssinia, is said to produce the best sort of gum arabic. Fragments of the stem, with the gum exuding, from Western as well as from Eastern Africa, are requested, in order to ascertain the identity or diversity of the gum produced by one and the same plant in different localities.

CALUMBA ROOT.—Whether this drug is furnished wholly by *Jateorhiza Columba*, Miers, or in part by *J. Miersii*, Oliv., both of them plants of Mozambique (but the latter found also in Madagascar), is not known. Travellers visiting the localities where the drug is collected should obtain good specimens of the plant, as well as living roots, which are fleshy and easily transported without earth.

TANGHIN of Madagascar (*Tanghinia venenifera*, Poir.).—A specimen is requested of the poisonous milky juice. A portion should be partially dried with a gentle heat; another portion should be mixed with spirit of wine and sent in a fluid state.

CAOUTCHOUC, or INDIA-RUBBER.—In Madagascar, as well as in Mozambique, there are several trees said to yield this substance. Good specimens and definite information should be collected.

INDIA, SIAM, AND THE INDIAN ARCHIPELAGO.

CATECHU, *vide* page 177.

BENZOIN, or GUM BENJAMIN.—It would be interesting to obtain good specimens of the tree which affords this drug in Siam in order to compare them with *Styrax Benzoin*, Dryand., which produces the Benzoin of Sumatra.

1871.

CAMPHOR OF BLUMEA GRANDIS, D.C.—Some pounds of it are desirable, in order that its nature may be investigated. (See 'Pharmacopœia of India,' p. 128.)

MISHMI BITTER, or MISHMI TITA.—The small yellow rhizome of *Coptis Teeta*, Wall., a drug known in medicine since a remote period, is produced in the Mishmi mountains to the east of Assam, and probably also somewhere on the confines of China further north. The plant which yields it is very little known, and complete specimens are desirable. It is possible that some second species may furnish a portion of the drug.

ACONITE ROOT has been imported in considerable quantities from India. In what district is it collected, and from what species of *Aconitum*?

AROMATIC BARKS, known as CULITLAWANG, MASOY, and SINTOC, derived from trees of the order *Laurineæ*, are objects of considerable trade in the Indian Archipelago. The traveller should embrace the opportunity, when it occurs, of seeing the bark collected, and of obtaining authentic specimens of it, and of the tree yielding it. Masoy Bark is produced on the west coast of New Guinea.

SALEP.—The tubers of several species of *Orchis* and *Eulophia* are collected and sold in India under the name of Salep. It is desirable to ascertain what species of Orchidaceous plants furnish this substance, especially in the Himalayas and in Cashmere.

MANNA.—It has for many years been asserted that a kind of manna is produced in the East on a species of Tamarisk. It requires to be determined whether any oriental Tamarisk yields a saccharine substance of the nature of manna, and whether it is collected, and where.

HEMP.—A very rough but tenacious hemp is produced in Northern India, at Kangra, and elsewhere, and bears the name of "*Kangra hemp*" or "*Himalayan hemp*." Is this the produce of *Cannabis Sativa*, of which there is some doubt?

1871. TANYIN—What is the source of the "*Tanyin fruit*" of the Burmese trade lists, and what its uses?

MOCHARAS.—This brown astringent substance, which is found in the bazaars of India, is said to be partly derived from *Salmalia Malabarica*, part is said to be an exudation from the trunk of the Areca palm (*Areca catechu*). It would be well to ascertain if any astringent substance is exuded, or whether any galls are formed, as some suggest, on *Areca catechu*. The source or sources of the *Mocharas* should be determined.

RAJAH-CANES, exported from Borneo. The species of palm yielding these is unknown.

What tree affords the so-called *Amboyna* or *Kyabocca* wood?

GUTTA-PERCHA is, even up to the present day, little known. It is said to be yielded by several plants, such as species of *Isonandra*, *Chrysophyllum*, *Sideroxylon* and others. Attention should be paid to the vernacular names, such as *Gutta-percha*, *Ugiato putih*, *Kotian*, *Tuban* or *Taban*, etc. Abundant and carefully preserved wet and dry specimens of the leaves, flowers, and fruits of the different kinds, the products of the same individuals from which the dried specimens are obtained, are greatly needed.

CAOUTCHOUC, or INDIA-RUBBER.—In the Malayan Archipelago there are many trees which yield caoutchouc. *Urceola elastica* is the source of the Borneo india-rubber.

What trees produce the so-called Singapore rubber, and the Java, Sumatra, and Siam kinds? Are they species of *Ficus*?

In Assam *Ficus elastica* is the chief, if not the only source of india-rubber. But *Ficus laccifera* may also yield it. Is any india-rubber collected from the latter, and is it kept separate or mixed with that of *F. elastica*? Specimens of each, accompanied by good dried specimens, would be valuable. Are there no other trees capable of yielding india-rubber in quantity? *Willughbeia edulis*, the "*Luti-am*" of Chittagong and Silhet, is said by Roxburgh to yield good india-rubber. Specimens of the india-rubber, and also carefully-prepared and abundant specimens of the leaves, flowers, and fruit, both dried and in spirit, are much needed.

1871.

CHINA, COCHIN-CHINA, AND THE PHILIPPINES.

RHUBARB.—The true source of the rhubarb produced in the western provinces of China and the adjacent regions is still unascertained. It is desirable to obtain living roots or seeds of the plants, as well as a full account of the collecting and drying of this well-known drug.

CAMPHOR.—That of commerce is obtained from Formosa and Japan. Is any produced in China, and where? The Camphor Laurel (*Cinnamomum Camphora*, Nees) is well known to flourish in many localities of the central provinces.

What is the camphor said to be obtained from a species of *Artemisia* (wormwood) called *Ngai?* A few pounds of it are desired.

CHINA ROOT is exported to Europe from Canton. The plant is said to grow in the provinces of Honan, Kwangtung, and Kwangsi. Good specimens of it are desired.

Root called *Green Putchuk Pă-chĭh*, of which large quantities are exported from Ningpo. The plant is an *Aristolochia:* to determine the species, pressed and dried specimens with roots would be acceptable.

CASSIA BARK, *vide* page 178.

CASSIA BUDS, *vide* page 178.

BAMBOO—Specimens in flower of a bamboo, affording the broad leaves which are pinned together by the Chinese to line tea-chests, are required to determine the species.

STAR ANISE. — Information should be collected by an eye-witness as to the production in Southern China of this spice. It is said to be brought to the Canton market by the Fokien junks. Botanical specimens of the tree, and full particulars regarding the collection of the fruits, are desirable.

CHINESE OIL OF PEPPERMINT (so-called) is said to be distilled at Canton. Pressed and dried botanical specimens of the plant *seen* to be used should be sent to England for the determination of the name.

1871

CARDAMOMS, *vide* page 178.

ST. IGNATIUS'S BEANS, called in the Philippines *Coyacoy*, or *Pepita de Catbalogan*. The plant, said to be a climbing shrub, to which the name *Ignatia amara* was given by the younger Linnæus, is a species of *Strychnos*, probably unknown to modern botanists. It is believed to grow in Bohol and Çebu, islands of the Bisaya group of the Philippines. As it is one of great interest, no opportunity should be lost for procuring abundant flowering specimens as well as the entire fruits, both dried and preserved in alcohol, and some considerable pieces of the stem with the bark attached.

ELEMI, *vide* page 179.

MEXICO, THE WEST INDIES, CENTRAL AND SOUTH AMERICA.

MEXICAN ELEMI, known in Mexico as *Copal*, is yielded by *Elaphrium elemiferum*, Royle, a tree growing near Oaxaca, good botanical specimens of which are much desired.

SARSAPARILLA, *vide* page 179.

CINNAMON OF ECUADOR.—This bark, which resembles the cinnamon of Ceylon, is produced by a noble tree growing in the province of Canelos. Specimens of it, including flowers and the large fruits preserved in alcohol, are much desired. The calyx of the fruit is used as a spice, under the name of *Ishpingo*.

BALSAM OF COPAIVA, *vide* page 180.

WOODS.—LIGNUM NEPHRITICUM.—This rare wood, noticed by some of the earliest explorers of America, is a production of Mexico. To what tree is it to be referred? Its infusion is remarkable for having the blue tint seen in a solution of quinine.

SATIN-WOOD OF THE WEST INDIES.—Specimens in flower and fruit, with the wood, are requested. The origin of the *Coca*, or *Cocus-wood* of the West Indies, is also uncertain. Specimens in flower of any tree affording the lancewoods of commerce in the West Indies or Central America are needed for the determination of the species.

1871.

KING-WOOD, MARACAYBO-WOOD and MUSTAIBA-WOOD, all imported from Brazil, and NICARAGUA-WOOD from Central America, are of unknown botanical origin.

THE ROSE-WOODS OF BRAZIL.—There is still some doubt as to the trees which yield the different varieties of this timber.

IPECACUANHA.—What is the plant which furnishes the *large Ipecacuanha root* of New Granada?

PAREIRA BRAVA.—The plant affording the inert woody stems which constitute the *Pareira Brava* of commerce, and which are exported to Europe from Rio de Janeiro, has not been ascertained, neither is the locality in which it grows accurately known. The subject is deserving of investigation.

CINCHONA BARK.—In addition to the bark of *Cinchona Tucujensis*, shipped at Puerto Cabello in Venezuela, there are others less known botanically which are brought from the same port. Some of these barks appear to be derived from varieties of *Cinchona cordifolia*, while others seem to belong to what is called *Quinquina* rose d'Ocaña. It would be interesting to have authentic specimens of the flowering and fruit-bearing branches of the trees, together with sections of the branches and trunk (the bark being *in situ*), for comparison with the species described by Karsten.

The so-called *False Cinchonas* may be distinguished, according to Dr. Weddell, by their capsules, which are generally large, and having valves which separate from the apex towards the base. The flowers are relatively large, and devoid of perfume. It would be of some interest to have authentic specimens of the barks of those trees belonging to the genus *Buena* (*Cascarilla* or *Ladenbergia*) in order to ascertain whether they contain alkaloids or not. The barks ought to be accompanied by flowering specimens. Some pounds of each bark would be required for chemical examination.

PARA RHATANY.—This root, imported from Pará in Brazil, is described in *Pharmaceutical Journal*, i. (1870) 84. The plant yielding it should be ascertained, for which purpose good specimens, including *entire roots*, are requisite.

1871. MILK OR COW TREE OF PARA.—Specimens in flower and fruit of this tree, which is called *Massaranduba*, are required for the accurate determination of the species.

CAOUTCHOUC, OR INDIA-RUBBER.—All the Central American caoutchouc is presumed to be obtained from *Castilloa elastica*, the "*Ule-ule*" tree. Are there any other species of this genus, or trees likely to be mistaken for *Castilloa elastica* sources of supply? In New Granada there is said to be a pinnate-leaved tree yielding caoutchouc—what is it?

HEVEA (SIPHONIA) BRAZILIENSIS is the chief source of Para india-rubber, but other species yield it, as *H. lutea*, *H. discolor*, *H. paucifolia* and *H. rigidifolia*. It would be exceedingly desirable to know the relative yield of these several trees, and to obtain good specimens of them.

In Pernambuco and Ceara there is much good india-rubber said to be the produce of *Hancornia speciosa*, the "Mangaba" of the Brazilians. Reliable specimens and information are desired.

In British and French Guiana caoutchouc trees exist, good specimens of which, with their several products, should be collected.

MALAMBO BARK.

(*Malambo-Rinde, von Croton Malambo.*)

1859. THE origin of this aromatic bark, which has been a disputed question ever since its introduction to Europe by Bonpland in the year 1814, has at length been satisfactorily determined by Mr. H. Karsten, of Berlin. A residence of twelve years in the northern countries of South America has enabled Mr. Karsten to make many interesting and important observations on the vegetation of that botanically rich region, the results of which observations he is now communicating to the scientific world in a magnificently illustrated work, under the title of *Floræ Columbiæ Terrarumque, adjacentium Specimina Selecta*.[1] From

Origin determined by Mr. H. Karsten.

[1] Berlin, F. Dümmler, folio.

this work, in which the Malambo tree is beautifully figured, we extract the following description and remarks :— 1859.

CROTON MALAMBO, Krst. *Euphorbiaceæ*, R. Br. *Character differentialis.*

Arbor foliis ovalibus, crenato-serratis, glabris basi bi- et in crenaturis uni-glandulosis.

Character naturalis.

Arbor duodecim- vel quindecim-pedalis in littoribus australibus maris caribæi habitans, trunco recto quadripedali, cortice suberoso flavescenti odore camphoreo-aromatico prædito, tecto; cacumine ramoso ellipsoideo; foliis alternis, glabris hircino odoris glandulis oleiferis, pellucido-punctatis bistipulatis,—stipulis minutis linearibus, acutissimis, caducis,—longe petiolatis, petiolis 1—2½ pollicaribus, lamina ovali basi rotundata excisa, subtus utrinque glandulam minutam, patelliformem gerentibus, margine crenato, in crenaturis glandulam illis similem fovente, 4—5 pollices longa 2—2½ pollices lata.—Inflorescentia terminalis racemosa, monoica. Flores bractea minuta, caduca sustentati, feminei inferiores 3—8, longe pedunculati, majores. Calyx campanulatus, quinquepartitus persistens, lobis lanceolato-triangularibus, margine pilosiusculis, æstivatione valvatis. Discus glandulosus hypogynus quinquedentatus; dentes (petala rudimentaria) filiformes, longitudine calycis urceoli, apice pilosi, subpenicillati, cum lobis calycinis alternantes. Ovarium pilis stellatis caducis hirtum, triloculare, loculis uniovulatis; styli tres basi pilorum fasciculo penicillato tecti, bifidi, stigmatosi. Flores masculini superiores plures, breviter pedicellati. Calyx quinquefidus extus pilis stellatis hirtus, lobis triangularibus, æstivatione valvatis. Petala quinque, lobis calycinis alterna, lanceolata, longitudine calycis, hyalina, intus pilosa et margine fimbriata, evanescentia, æstivatione imbricata. Stamina 18—20 disco piloso, decem crenato inserta; filamenta libera, subulata, glabra, per æstivationem erecta; antheræ ovales birimosæ basi affixæ. Pollen globosum granulosum. Ovarii rudimentum nullum. Fructus sub-globosus 3‴—4‴ in diametro, stylorum residuis coronatus, lævis, glaber, capsularis, tricoccus, coccis monospermis; seminis (haud maturi) testa flavescens. Floret Majo.

The Malambo Tree.

Inflorescence.

Fruit.

The preceding species is distinguished from every other of the genus *Croton* (as we find from Baillon's recent labours on this family) by the 10-sided glandular ring of the male flower

1859. and the position of the stamens in the bud, which while in this state are not incurved, as is usual in the genus, but stand perfectly erect. To found a generic division, however, upon these characters appears unnecessary. To the sub-genus *Eucroton* (Baillon, *Étude générale des Euphorbiacées*, 1858) *C. Malambo* is in close proximity. From the very few species with glabrous leaves with which *C. Malambo* may be compared, the latter is distinguished by its *oval* leaves from *C. castaneifolium*, L. (*Sp. Pl.*, ed. 1), which has *lanceolate* leaves, and from *C. ovalifolium*, Willd. and *C. microphyllum*, Lom., by its being glabrous and not hairy.

Croton Malambo.

Croton Malambo grows in the neighbourhood of the Caribbean Sea on the north coast of Venezuela and New Granada, in the former of which countries it is known by the names of *Torco* or *Palo Mathias*, and in the latter by that of *Malambo*. In New Granada especially, it is of very frequent occurrence in the country lying between Rio Hacha and Carthagena, where sometimes in the low forests of the coast it prevails to a vast extent. Its stem, which grows to a height of four feet, is covered with a yellowish-white, rough, externally somewhat corky bark, which possesses a very aromatic odour resembling that of *Calamus aromaticus*. The leaves have, when bruised, a peculiar hircine odour, which is not very agreeable. The bark is a remedy of considerable reputation throughout all Columbia; its aqueous infusion is used inwardly in diarrhœa and as a vermifuge, while the alcoholic tincture is employed externally in rheumatism. Its application for these purposes is extolled by both the medical profession and the public. It is said also to have proved useful in the treatment of cholera.

[In the United States, it is said to be largely used for the adulteration of ground spices.]

FRANGIPANI.

(*Notes and Queries*, Dec. 24, 1859.)

1859.

Origin of the word.

THIS is the name of a composition sold as a perfume, and which of late, through the enterprise of its vendors, has been much pressed on the attention of the public through the adver-

tising columns of our newspapers and periodicals. The origin of the term seems worthy of a note; especially as many, I doubt not, have like myself supposed it to be without more signification than the names of other perfumers' nostrums: as, for instance, *Guards' Bouquet, Jockey Club,* and the like. 1859.

Frangipani is the name of a very ancient and illustrious family of Rome, one member of which, Mutio Frangipani, served in France in the Papal army during the reign of Charles IX. The grandson of this nobleman was the Marquis Frangipani, Maréchal des Armées of Louis XIII.; and he it was who invented a method of *perfuming gloves,* which, when so perfumed, bore the name of "Frangipani gloves."[1] Ménage, in his *Origini della Lingua Italiana,* published at Geneva in 1685, thus notices the Marquis and his invention :— The Frangipani family.

"Da uno di que' Signori Frangipani, (l'abbiam veduto qui in Parigi) furono chiamati certi guanti porfumati, *Guanti di Frangipani.*"

From the following passage in Le Laboureur's *Mémoires de Castelnau,*[2] it appears that the brother of the Marquis Frangipani had a share in the invention :—

"Ce dernier Marquis Frangipani, et son frère mort auparavant luy, inventèrent la composition du parfum et des odeurs qui retiennent encore le nom de Frangipane."

What the composition of the perfume was that gained for the Marquis so much reputation, I have not been able to discover. Ménage, who, it will be observed, was a contemporary, and had met the Marquis in Paris, alludes merely to *perfumed gloves,* and I am inclined to think that this was the only form in which the invention at first appeared. Le Laboureur speaks of his inventing "la composition du parfum et des odeurs," which perhaps may be understood to refer to some essence, powder, or pommade. This much, however, is certain, that various The Perfume.

[1] *Vide* Bayle, *Dictionnaire Historique et critique; Moreri, Grand Dictionnaire,* ed. 1740, tome iv. p. 183.

[2] Ed. Bruxelles, 1731, tome ii. p. 651.

1859. compositions, as *pommade, essence,* and *powder,* distinguished by the name of *Frangipani* or *Frangipane,* were sold by perfumers down to the early part of the present century, when they gradually fell into disuse. During the last few years, however, the name has again found its way into the list of perfumes, and *Frangipani* is now more sold than it probably ever was before. The *formulæ* for the various compounds, as "Pommade à la Frangipane," "Esprit de Frangipane," &c., are so utterly discrepant, and have such slender pretensions to represent the original, that it is needless to quote them, and I shall only refer the reader who wishes for them to the works named below.[1]

Perfumed Gloves.

The subject of *perfumed gloves,* which, I may remark, have long since disappeared from use, introduces us to some curious particulars regarding the trades of glover and perfumer. Savary, in his *Dictionnaire universel de Commerce* (Genève et Paris, 1750), tells us that the glovers of Paris constitute a considerable community, having statutes and laws dating back so far as 1190. These statutes, after receiving various confirmations from the kings of France, were renewed, confirmed, and added to by Louis XIV. under Letters Patent in March, 1656. The glovers are therein styled "Marchands Maîtres Gantiers-Parfumeurs." In their capacity of glovers they had the right of making and selling gloves and mittens of all sorts of materials, as well as the skins used in making gloves; while as perfumers they enjoyed the privilege of perfuming gloves and of selling all manner of perfumes. Perfumed skins were imported from Spain and Italy, and were used for making gloves, purses, pouches, &c.; they were very expensive and "fort à la mode," but their powerful odour led to their disuse. With regard to gloves, Savary remarks:—

The Glovers of Paris.

"Il s'en tiroit autrefois quantité de parfumes d'Espagne et de Rome; mais leur forte odeur de musc, d'ambre et de civette, qu'on ne pouvoit soutenir sans incommodité, a fait que la mode et l'usage s'en sont presque perdus: les plus estimés de ces Gans étoient les Gans de Franchipane et ceux de Neroli."[2]

[1] Celnart, *Nouveau Manuel complet du Parfumeur,* Paris, 1854, 18mo.; Piesse, *Art of Perfumery,* London, 1856, 8vo.

[2] Tom. ii. p. 619.

1859.

Many receipts are extant for the perfuming of gloves, and though some of them are curious, they are too lengthy for me to quote more than the titles. Here, in the *Secreti de la Signora Isabella Cortese, ne' quali si contengono Cose Minerali, Medicinali, Artificiose ed Alchimiche, e molte de l'Arte Profumatoria, appartenenti a ogni gran Signora* (Venet., 1574, 12mo), we find directions for "Concia di guanti perfettissima, con musco ed ambracan," and again "Concia di guanti senza musco perfetta." I have also before me, from an old French work published at Lyons in 1657,[1] the precise directions for "Civette très-exquise pour parfumer gands et en oindre les mains." In these compositions musk, ambergris, and civet, were the chief perfumes; and as they were applied inside the gloves, combined with some sort of oil or grease, their use at the present day would be thought intolerable. The gloves of Frangipani were also prepared with grease, as I think we may gather from the following lines of Cerisantes:—[2]

The Secrets of Alexis.

"Amice, nil me sicut anteà juvat
Pulvere vel Cyprio
Comam nitentem pectere;
Vel quas Britannus texuit subtiliter
Mille modis varias
Jactare ventis tænias;
Vel quam *perunxit* Frangipanes ipsemet
Pelle, manum gracilem
Coram puellis promere."

Frangipane.

The word *Franchipanne*, or *Frangipane*, is applied in French cookery to a sort of pastry composed of almonds, cream, and sugar. In the West Indies it is used to designate the fruits of *Plumiera alba*, L., and *P. rubra*, L., because, according to Mérat and De Lens,[3] "on retrouve dans ces fruits mûrs le goût de nos franchipanes." If these fruits are eatable, it is remarkable that neither Sloane nor Lunan mentions the fact. *Frangipanier* is however, the French name of the *Plumiera*.

[1] *Les Secrets du Seigneur Alexis Piemontois.*

[2] They form part of an ode addressed "Ad Vincentem Victurum," which may be found at the end of the Latin letters of Balzac (*Balzacii Carminum Libri tres: ejusdem Epistolæ Selectæ*, ed. *Æg.* Menagio, Paris, 1650, 4to).

[3] *Dict. de la Matière Medicale*, tome v. 405.

ON TWO TUBERIFORM VEGETABLE PRODUCTIONS FROM TRAVANCORE.

EXAMINATION BY THE REV. M. J. BERKELEY, M.A.

(*Read before the Linnean Society, March* 3, 1860.)

1860.

IN the spring of the year 1858 a notice was read of some remarkable vegetable productions from China.[1] Two similar organisms have lately been transmitted by Dr. E. J. Waring, of Trevandrum, Travancore, to Mr. Hanbury, who has kindly intrusted them to me for examination. Prepared sections accompanied the specimens, and I have had the advantage of Mr. Currey's assistance in their examination; after all, however, I can do little more than place on record the account transmitted to Mr. Hanbury.

Puttu-manga.

The first, called in the Tamil language புற்றுமாங்காய *Puttu-manga*, a name which I understand may be translated *White-ant Mango* or *White-ant Fruit*, occurs in Travancore. The following history of it was sent with the specimens to Mr. Hanbury:—"Three weeks since, I had occasion to open the floor of the centre room of my house for the purpose of building two walls; and on digging to the depth of three feet below the surface, I found several holes scooped out in the earth, perfectly smooth and circular, of sufficient size to admit a man's hand. Hanging down from the sides of these cavities were clusters of 4, 5, 6, or 10 of the accompanying fruits, of various sizes and shapes. On showing them to the native practitioners, they eagerly took possession of the greater number, calling them by the name of *Puttu-manga*, and stating that they were found, though but rarely, under the foundations of old buildings, and that they were formed or produced by the white ants. They likewise stated that they were highly valued for medicinal purposes. The cavities above alluded to are doubtless the chambers or galleries formed by the white ants."

[1] *Journ. of the Proceedings of the Linnean Society*, vol. iii. (1859) Botany, p. 102.

1860.

Description of the first Specimen.

They look at first sight extremely like some neat variety of *Xylaria polymorpha*, with a slender stem and pointed barren apex. There are, however, no perithecia beneath the jet-black cuticle; and the structure is not delicately filamentous, as in *Xylaria*. On the contrary, the mass consists of very irregular, swollen, and sometimes constricted, more or less anastomosing, and more or less densely compacted threads. Towards the margin the substance is firm, but looser towards the centre, so that the individual threads easily separate. The structure in some respects resembles that of *Pachyma;* but there is no indication of the threads having undergone any chemical change. I should say that it is certainly not the root of any Phænogam, but of a fungous character, though it does not exactly agree in structure with anything that I know. Notwithstanding some little resemblance, it cannot, I think, be associated with *Pachyma Cocos;* and therefore, if it be desirable to give so very doubtful a production a name, it may be called *Sclerotium stipitatum*, Berk. & Curr. It is distinguishable at once by the stem and the shining black continuous cuticle. The total absence of veins and different texture forbid its junction with *Mylitta*.

Sclerotium stipitatum.

Second Specimen. *Carom-pallagum.*

The second production, also sent by Dr. Waring to Mr. Hanbury from Travancore, is known by the name of Carom-pallagum, which may be rendered *Black Pallagum*, *Pallagum* signifying *a medicinal substance.* It is dug from the chalk-beds in the mountains which separate Travancore from Tinnevelly. The hill people, who bring it occasionally into Trevandrum for sale, state that it is the root of a small plant with a red flower. It is much esteemed by the native doctors for various complaints.

The account, however, which the natives give of its origin is evidently wrong; for it cannot be pretended that, like *Pachyma*, it may be a peculiar state of the root of some Phænogam. Its structure is in fact very like that of *Mylitta australis;* and though there is a slight difference in the outer coat, it is probably the same thing with the *Mylitta* of China, known under the name of *Luy-wan*, and to which Horaninow has given the name of *Mylitta lapidescens* (*Catalogus Medicamentorum Sinensium*, Petropoli, 1856, p. 34).

Luy-wan.

1860. The specimens, indeed, are not so much advanced as those of the Luy-wan, so that the peculiar sacs are few and only partially developed; but there is no doubt that the structure of the two is identical.

REMARKS ON SCLEROTIUM STIPITATUM, BERK. ET CURR., PACHYMA COCOS, FRIES, AND SOME SIMILAR PRODUCTIONS.

By Frederick Currey, M.A., and Daniel Hanbury.

(*Read before the Linnean Society, May* 3, 1860.)

1860. We have investigated with some attention the nature of the body to which, in the preceding paper, Mr. Berkeley has given the name of *Sclerotium stipitatum*, and have compared it with the other tuberiform bodies described by him in a former paper published in the 3rd volume of the Journal of this Society. These other bodies are, *Pachyma Cocos*, Fries (the *Pe-foo-ling* of the Chinese): the substance called in China *Choo-ling*; and Professor Horaninow's *Mylitta lapidescens*. We have thought that a few additional remarks, accompanied by figures of the specimens and of their microscopic structure, may facilitate future inquiries, which are much needed in order to arrive at a satisfactory conclusion as to the nature of these anomalous productions.

Sclerotium stipitatum.

And first with regard to *Sclerotium stipitatum*. Pl. IX. Figs. 1, 2, and 3 represent the only three specimens which have hitherto reached this country, nearly their natural size. We are quite of Mr. Berkeley's opinion, that they are of a fungoid nature, although it is impossible to speculate as to what the perfect state may be. Several hard, shapeless, fungoid bodies, the nature of which was long misunderstood, have been found to produce, under favourable circumstances, perfect *fungi* of well-known and very diverse genera. The tuber from which *Peziza tuberosa* is ultimately produced was supposed by Hedwig to be a dried anemone root; and the true nature of the common ergot of rye was quite unknown until Tulasne called attention to the fact that it consists only of compact mycelium, which

Fungoid nature.

Peziza tuberosa.

1860.

under particular treatment, may always be made to produce a species of *Cordyceps*,—an observation which has since been verified by Mr. Berkeley and other mycologists. There is a black, cylindrical, fungoid body found in the interior of the stems of rushes, long known by the name of *Sclerotium roseum*, which has lately been found to give rise in the spring of the year to a species of *Peziza*, a description of which will be found in the 1st volume of the Journal of this Society.[1] This *Sclerotium* has also been treated successfully under cultivation : a specimen was gathered last November and kept during the winter under the requisite conditions of moisture; and in the first week in April the *Peziza* appeared, a few days only before its occurrence in its native habitat. We think it not improbable that *Sclerotium stipitatum* might be treated so as to induce it to perfect its fructification; and we have some hope of procuring a further supply of specimens from India, to enable us to institute the necessary experiments. The specimens hitherto received, besides being only three in number, were destined by their sender, Dr. Waring, for the Museum of the Pharmaceutical Society. Plate IX., Fig. 4, represents a thin section of the white inner substance of the *Sclerotium*, taken from near the circumference. The threads are of very irregular shape, and hardly similar in any two sections; but their general nature may be seen from the figure just referred to.

Sclerotium roseum.

Sclerotium stipitatum.

2. *Pachyma Cocos*, Fries. The variety of names which this remarkable substance has received renders a list of its synonyms not undesirable; we therefore subjoin one which, with the needful references, will, we believe, be found nearly, if not quite, complete.

Pachyma Cocos, Fries, *Syst. Mycologicum*, vol. ii. (1822), p. 242 vol. iii. (1829) p. 223 ; *Elenchus Fungorum*, vol. ii. p. 39. Oken, *Lehrbuch d. Naturgeschichte*, 2ter Theil, Botanik, 2te Abtheil. 1te Hälfte (1825), p. 93. Tulasne, *Fungi hypogæi*, p. 197.

Synonyms of *Pachyma Cocos.*

P. solidum, Oken, *Lehrbuch d. Naturgeschichte* (*l. c.*), p. 93.

P. Pinetorum, Horaninow, in Tatarinov, *Catl. Medicamentorum Sinensium* (Petrop. 1856, 8vo), pp. 2-23.

[1] "On a new Species of *Peziza*, being the full development of *Sclerotium roseum*, Kneiff." By F. Currey, Esq., F L.S. (*op. cit.* vol. i. p. 147).

1860.

Synonyms of *Pachyma Cocos.*

P. Coniferarum, Horaninow in litt.

Sclerotium Cocos, Schweinitz, *Synopsis Fungorum Carolinæ Superioris*, in Act. Societatis Naturæ Scrutatorum Lipsiensis, tom. i. (1822) p. 56.

Lycoperdon cervinum, Walter, *Flora Caroliniana* (1788), p. 262.

L. solidum, Gronovius, *Flora Virginica* (1762), p. 176. Macbride, *Linn. Trans.* vol. xii. (1818) p. 368.

Tubera Terræ maxima, externe pulla et scabra, intus candida, Gronovius, *Flora Virginica* (1743) pars ii. p. 205.

Indian Bread or *Tuckahoe*, M. J. B. in *Gardeners' Chronicle*, 16 Dec. 1848.

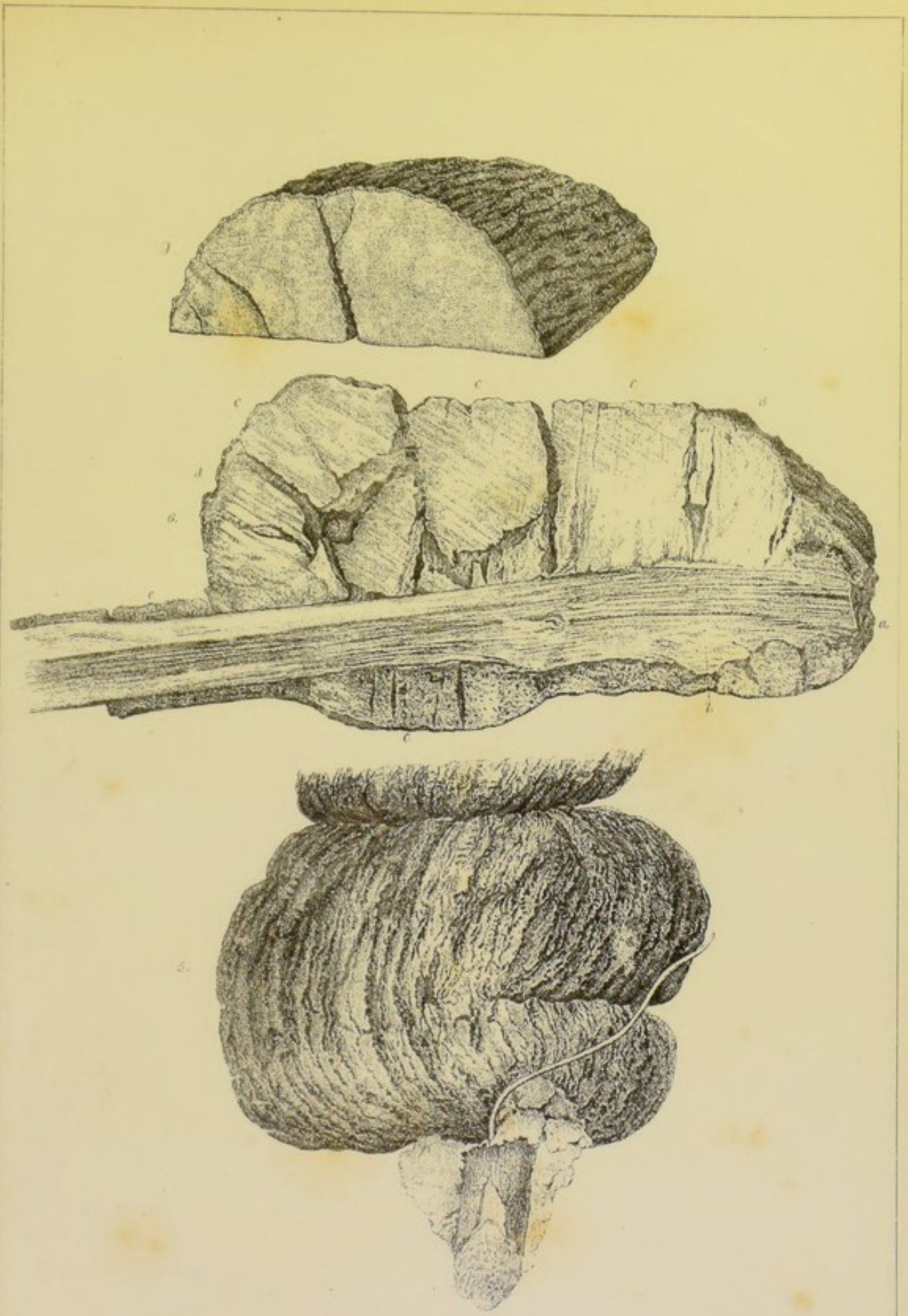
Pĕ-fŏ-lim, Cleyer, *Specimen Medicinæ Sinicæ* (1682), *Med. Simp.* No. 189.

茯苓 (*Fŭh-ling* vel *Foo-ling*), Pun-tsaou-kang-muh, cap. xxxvii. sect. 4 (cum icone).

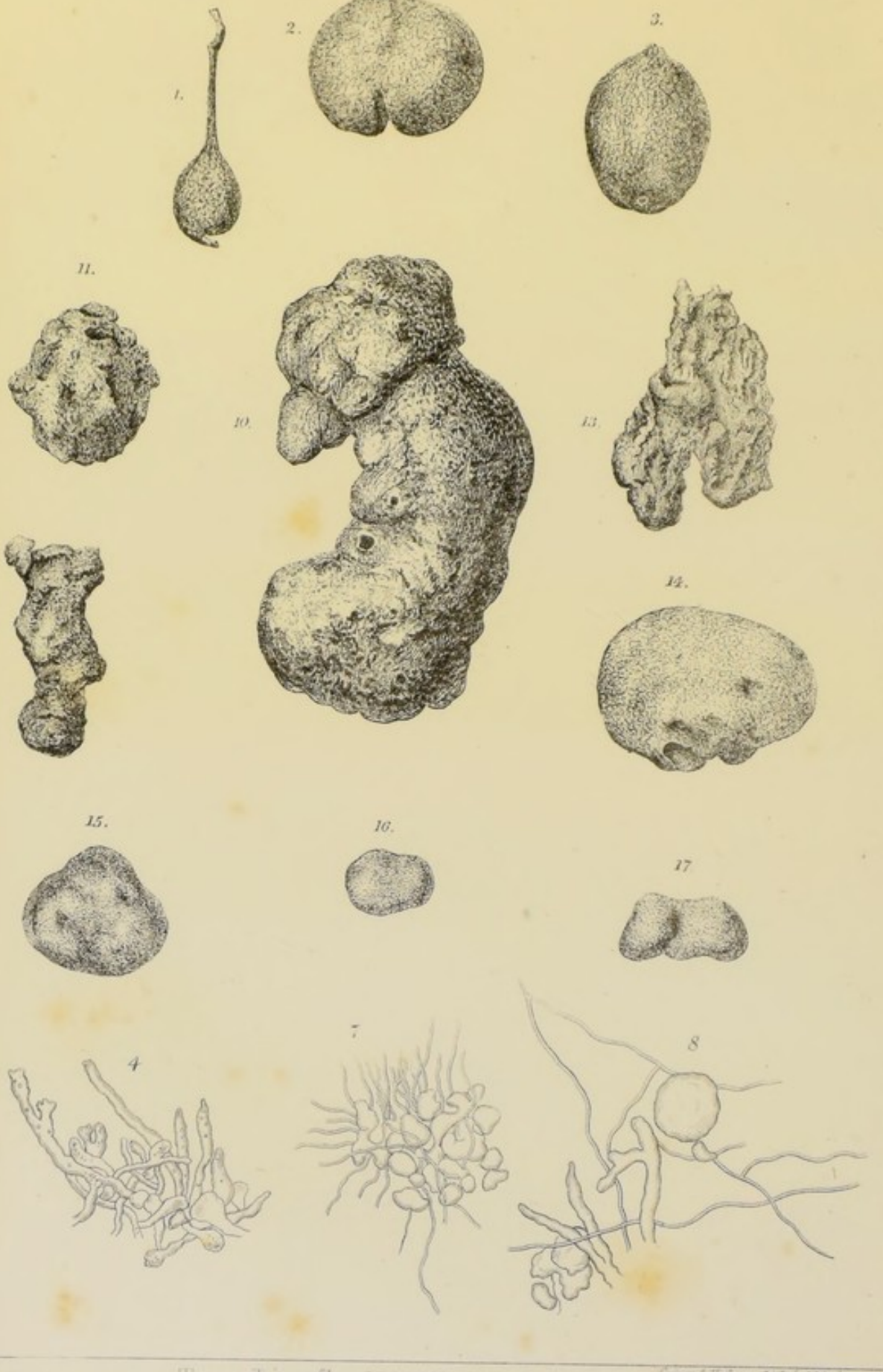
Fine specimens of this production, received many years since from Dr. Macbride of South Carolina, and described by him in the 12th volume of the *Linnean Transactions*, under the name of *Lycoperdon solidum*, are to be seen in the Museum of the Society; and one of the most characteristic of these specimens is represented in Pl. X. Fig. 5. Pl. X. Fig. 6 represents a longitudinal section of a very similar specimen, and is interesting as exhibiting very completely the manner in which the root has been affected by the *Pachyma*. Dr. Macbride states that the *Pachyma* originates between the wood and bark of living roots, that it gradually detaches the bark, while it spreads round the wood and converts it into a substance similar to itself. The present section, however, exhibits an intermediate condition; for, although the bark is detached and the *Pachyma* interpolated between it and the wood, a great part of the wood itself is but little affected. The portion referred to by the letter *a* retains its natural colour and appearance; and when examined in section under the microscope, is found to consist of healthy woody tissue in an almost perfect state. This portion, when looked at with a lens, or even with the naked eye, may be seen to be traversed by narrow longitudinal white streaks, which the microscope shows to be very similar in composition to the part marked *b*, next described. This part (*b*) to the naked eye looks like

Lycoperdon solidum.

Description of Plate X.



Trans. Linn. Soc. Vol. XXIII. Tab. 10. P. 97. Cooper & Yeates, 5th. 388 Strand.



Trans. Linn. Soc. Vol. XXIII. Tab. 9. P. 97.

Cooper & Hodson, lith.t 188, Strand.

1860.

wood of a very pale colour, but it presents a totally different appearance under the microscope. It consists of what appears to be a mass of mycelium, the threads of which have forced their way through the substance of the wood in every direction, separating the cells and converting them into irregularly-shaped bodies of a highly refractive nature, having a good deal the appearance of starch-granules, but without any concentric markings, and exhibiting no reaction with iodine. A section of this portion is shown in Pl. IX. Fig. 7. The remaining parts of the specimen, marked *c* and *d*, and which constitute the main portion of the *Pachyma*, bear a general resemblance, when seen under the microscope, to the section shown in Fig. 7; but the component bodies vary more in size and many of them attain larger dimensions: the mycelium also is far less plentiful. A reference to Pl. IX. Fig. 8 will show the form of a few of the latter bodies, a combination of which with tissue, such as that shown in Fig. 7, constitutes the mass of the *Pachyma*. We entertain no doubt that the bodies shown in Pl. IX. Fig. 8 are of the same nature as those in Pl. IX. Fig. 7, *i.e.* they are wood-cells, in a more advanced state of disease and distortion. If it is wished to examine the threads or mycelium separately from the substance of the *Pachyma*, it may be done by selecting a specimen such as that shown in Pl. X. Fig. 9, in which the substance is traversed by cracks. It will then be seen that (at least in some specimens) the opposite walls of the cracks are united by masses of white woolly fibres; and by taking a small quantity of the wool in forceps, and placing it under the microscope, it will be seen to consist exclusively of delicate threads entirely free from the irregularly-shaped starchy-looking bodies forming the mass of the *Pachyma*. These threads are similar to those in Pl. IX. Fig. 7, and are, we suspect, of fungoid origin; and although we see no reason to doubt that the *Pachyma* is in the main (as has been long supposed) only an altered state of the root of the tree, we think it highly probable that that altered state is the effect of fungoid disease, and that all the threads above alluded to may be the mycelium to which the disease is due. The section shown in Pl. X. Fig. 6 exhibits at one end, at the points *c*, a brown

Plate IX.

Description of Microscopic structure.

1860. dusty mass, formed by the disintegration of the inner bark. The greater part of the interior of this specimen is of a dirty brown colour, produced by a copious admixture of the particles of the bark with the substance of the *Pachyma*, which latter is not so pure and white as is usually the case.

3. *Choo-ling*, Berkeley, *Journal of Proceedings of Linn. Soc.* vol. iii. (1859), Botany, p. 102.

Synonyms of *Choo-ling.*

Chū-lîm, Cleyer, *Specimen Medicinæ Sinicæ* (1682), *Med. Simp.* No. 207.

Czzu-lin, Tatarinov, *Catal. Medicamentorum Sinensum* (Petrop. 1856), p. 17.

豬苓 (*Choo-ling*), Pun-tsaou-kang-muh, cap. xxxvii. sect. 4 (cum icone).

(?) *Hoelen*, Rumph. *Herb. Amb.* xi. p. 123.

Pl. IX. figs. 10-13 represent specimens of this production, as to which we have little to add to Mr. Berkeley's account (*ut supra*). No botanical name has yet been proposed for it, which, in the uncertainty that exists respecting its origin and nature, is not to be regretted.

Microscopic Structure of *Choo-ling.*

Its microscopic structure is similar to that of *Pachyma Cocos;* but the threads by which its substance is traversed are much more interwoven and more branched, being in fact almost reticulate : they have not the appearance of being the mycelium of any fungus. We observe the same irregularly shaped bodies as in the *Pachyma;* but their dimensions, as remarked by Mr. Berkeley, are smaller: like the *Pachyma*, they are not rendered blue by iodine. In one or two specimens we have noticed an abundance of doubly pyramidal crystals, and we have also observed that the substance of the interior is much more tough and leathery than in *Pachyma*, which latter is in fact easily pulverizable. The specimens of *Choo-ling* vary much in size as well as in form. The largest we have (and which is drawn in Pl. IX. Fig. 10) weighs 481 grains, and the smallest 15 grains; the average of 46 specimens is 86 grains. All exhibit a thin, black, more or less shrivelled cuticle, closely investing the uniform, corky, cream-coloured substance of which the mass of the tuber consists.

1860.

4. *Mylitta lapidescens*, Horaninow, in Tatarinov, *Catal. Medicamentorum Sinensium* (Petrop. 1856), p. 34.

Synonyms of Mylitta lapidescens.

Lâi uôn, Cleyer, *Specimen Medicinæ Sinicæ* (1682), *Med. Simp.* No. 227.

雷丸 (*Luy-wan*), Pun-tsaou-kang-muh, cap. xxxvii. sect. 4 (cum icone).

சரும்பாலகம் *Carom-pallagum.*

The fourth tuberiform substance to which we have alluded is that named by Horaninow *Mylitta lapidescens*. Specimens of this production, both from India and China, are drawn in Pl. IX. Figs. 14-17. In a dry state they are extremely hard, so much so that, in the case of the Indian specimens, they might easily be supposed at first sight to be some stony substance from the chalk-beds out of which they are dug. There can be no doubt, however, of their vegetable nature, and but little, we think, as to their affinity with the hypogæous fungi. Although no trace of fruit is discernible, the inner substance is marked with veins, and a microscopic section shows the division of the tissue into *areolæ* similar to that exhibited by the hypogæous fungi. It is not easy to say whether it is truly of parasitic growth, though the natives of India assert it to be so. It will be seen, by referring to Pl. IX. Fig. 15, that the specimen there represented has a small root-like excrescence on the left-hand side ; and this excrescence, of which we have examined sections, is certainly of woody structure, although we are unable to say to what plant it belongs. Out of fifty Chinese specimens, however, only four exhibit these roots, which it is possible may be of accidental occurrence. The largest of these specimens weighs 106 grains, and the smallest 5 grains, the average weight of 50 being 24·6 grains. The largest Indian specimen weighs 268 grains.

Microscopic structure.

We are informed by Dr. Waring that the native Indian name, *Carom-pallagum*, means literally *Black pallagum*, *pallagum* signifying *a medicinal substance*. Our specimens are all grey or brown rather than black ; but the wrinkles on the surface, which are very minute, and which cannot be seen clearly without a lens, are of a very dark colour. It is possible that the specimens

Colour, grey or brown, not black.

1860. when moist and fresh, may be of a darker colour than when in the hard and dry condition in which they reach this country. We think it hardly probable that the dry specimens in our possession should be brought to fructify, although the instance of ergot of rye producing fruit after having been baked in an oven shows that fungi may undergo a good deal of hard treatment without losing their vitality.

Mylitta lapidescens. We are experimenting with the *Mylitta;* and if we succeed in causing it to produce fruit, we shall not fail to report the result.

Explanation of Plates.

Plates IX. & X.

Explanation of Plates. Figs. 1, 2, 3. Specimens of *Sclerotium stipitatum*, Bk. and Curr.

Fig. 4. Thin section of the inner substance of *Sclerotium stipitatum*, highly magnified.

Fig. 5. Specimen of *Pachyma Cocos*, Fr., in the Linnean Society's herbarium.

Fig. 6. Longitudinal section of another specimen in the same herbarium.

Figs. 7 and 8. Thin sections of portions of the latter specimen, highly magnified.

Fig. 9. Portion of another specimen of *P. Cocos* in the Linnean Society's herbarium, showing cracks in the substance, the walls of which cracks are united by woolly fibres.

Figs. 10 and 13. Specimens of *Choo-ling.*

Figs. 14 and 17. Specimens of *Mylitta lapidescens*, Horan.

NOTE ON A MANUFACTURED PRODUCT OF SEA-WEED CALLED *JAPANESE ISINGLASS.*

(*Sogenannte Japanische Hausenblase.*)

1860. The communication to the Académie des Sciences of Paris by M. Payen[1] of the results of his examination of a gelatinous

[1] "Sur la Gélose et les Nids de Salangane," *Comptes Rendus*, 17 Oct. 1859.

substance manufactured from sea-weed in China and Japan, induces me to offer a few additional remarks upon the same subject, and also to draw attention to some specimens of the substance in question. It will be most convenient to commence with the specimens, of which I have two. 1860.

Japanese Isinglass [so-called].

1. Under the incorrect name of *Japanese Isinglass*, there has been lately imported into London from Japan, a quantity of a substance having the form of compressed, irregularly four-sided sticks, apparently composed of shrivelled, semi-transparent yellowish-white membrane; they are 11 inches long by from 1 to 1½ inch broad, full of cavities, very light (each weighing about three drachms), rather flexible but easily broken, and devoid of taste and smell. Treated with cold water, a stick increases greatly in volume, becoming a quadrangular spongy bar with somewhat concave sides 1½ inch wide. Though not soluble in cold water to any important extent, the substance dissolves for the most part when boiled for some time, and the solution, even though dilute, gelatinizes upon cooling.

2. The second specimen, also from Japan (which I owe to the kindness of the late John Reeves, Esq.), resembles the preceding in all its properties, but its form is very different, it being in long, shrivelled strips about ⅛ of an inch in diameter. These strips when immersed in water speedily increase in volume, and are then seen to be irregularly rectangular. This substance in colour is usually whiter than the preceding; it is also more readily soluble, cleaner, and altogether a more carefully manufactured article.

Gélose.

The substance under notice in all its forms is used by the Europeans in China as a substitute for true isinglass, for which many of its properties render it highly efficient. That which is perhaps most distinctive, is its power of combining with a very large proportion of water to form a jelly. This property is due to the principle named by M. Payen *Gélose*, of which the Japanese sea-weed product mainly consists. The jelly formed by boiling this sea-weed product or crude gélose in water, and allowing the solution to cool, requires a high temperature for fusion, differing in this respect from a jelly made of isinglass, which readily fuses and dissolves in warm water. This character occasions a peculiarity in the taste of culinary jellies made of

1860.

the new material, inasmuch as they do not dissolve in the mouth as ordinary animal jelly. The jelly of gélose is but little prone to undergo change—so little indeed that sometimes under the name of *sea-weed jelly*, it is imported to this country from Singapore, sweetened, flavoured and ready for use, and in this state it may be kept for years without deterioration.

Seaweed Jelly.

Chemical characters of Gélose.

Gélose differs from animal gelatine in not precipitating tannic acid; from starch jelly in not being rendered blue by iodine; from gum, by its insolubility in cold water and its great gelatinizing power. From the mucilage of *Chondrus crispus*, named by Pereira *carrageenin*, it appears to differ chiefly in its power of combining with a great amount of water to form a jelly, which is not the case with carrageenin.

Botanical origin of Gélose.

Of the botanical origin of crude gélose, or Japanese isinglass, and the mode of its preparation in Japan and China we are not yet well informed. M. Payen finds it may be extracted from many species of sea-weed, but especially from *Gelidium corneum*, Lamour., and *Gracilaria lichenoides*, Grev., the former of which yielded in his experiments to the extent of 27 per cent. *Gelidium corneum* is certainly used by the Chinese, as I find by a small collection of economic Chinese *algæ* sent to the Society of Arts in 1857, the specimens in which Dr. Harvey of Dublin has at my request been kind enough to examine and name. It appears, however, that several other sea-weeds are likewise employed by the Chinese, some of them on account of their gelatinous qualities; such are *Laurencia papillosa*, Grev., *Laminaria saccharina*, Lamour., *Porphyra vulgaris*, Ag., and a species of *Gracilaria*, apparently *G. crassa*, Aarv. (Alg. Zeylan. No. 29.) Another sea-weed which is largely collected in the Indian archipelago for exportation to China, and which is one of the species known as *Agar-agar*, is *Eucheuma spinosa*, Ag.

NOTES ON CHINESE MATERIA MEDICA.

REVISED BY THE AUTHOR.


MONGOLIA
SHINGKING
COREA
Peking
The Great Wall
SHANSI
PEH-CHI-LI
SHEN-SI
KAN-SU
SHANTUNG
TIBET
HO-NAN
KIANG-SU
Shanghai
ANGAN-HWEI
HU-PEH
SZ-CHUEN
CHE-KIANG
KIANG-SI
KWEI-CHAU
HUNAN
FUH-KIEN
YUN-NAN
FORMOSA
KWANG-SI
KWANG-TUNG
Canton
Hongkong
ANNAM
HAI-NAN

NOTES ON CHINESE MATERIA MEDICA.

1860-62.

To draw up a general description of Chinese Materia Medica is a task that, in the present state of our knowledge of the natural history of China, it were almost vain to attempt. Opportunities for scientific investigations in that vast country have as yet been far too limited, its zoology, botany, and mineralogy too little explored to enable any one to describe other than in a very imperfect manner even a small number of the varied products derived from the animal, vegetable, and mineral kingdoms, which come under the general denominations of *drugs*. But although sources of information are scanty, they are not entirely wanting; and I have, consequently, been led to think that under the simple title of *Notes*, it might be both useful and interesting to place on record such remarks upon Chinese Materia Medica as have been suggested by the examination of a considerable number of specimens which I have received through the kindness of friends in China. That, therefore, which I propose to do in the following pages is to give a short descriptive catalogue, firstly, of some of the mineral substances employed in Chinese medicine, which I have had the opportunity of examining, and of most of which I possess specimens; and, secondly, of a small number of animal and vegetable products, which may, from their origin, uses, or affinities, be of interest to the pharmacologist. The imperfectness of the information I have collected will, I trust, induce further researches on the part of those who, being residents in China, have opportunities which I cannot command, but with whose labours I shall always be glad to co-operate.

Sources of information.

1860-62.

Before commencing the task proposed, it is desirable briefly to review some sources of information upon Chinese Materia Medica, to which frequent reference will have to be made.

The Chinese Herbal Pun-tsaou-kang-mŭh.

Of a considerable number of native works, the most important and well-known is, undoubtedly, the great herbal entitled *Pun-tsaou-kang-mŭh*,[1] written by Le-she-chin, in the middle of the sixteenth century. It was commenced in the reign and by the command of the Emperor Kea-tsing, and completed by the son of the author in the reign of Wan-leih, to whom it was presented in the year 1596. For some centuries previous to this period, works of the same character had appeared at intervals, some of them published by authority of the government, and others by private individuals. Of a few of these works, Du Halde has preserved slight notices, to which I would refer the reader who is desirous of further information.[2]

Description of the Chinese Herbal.

According to this author, the Pun-tsaou of Le-she-chin was written with the design of obviating the difficulties and confusion arising from a multitude of authorities, by supplying in one work a compendium of all that was more valuable in its predecessors. This design it probably fulfils, as it is held in high estimation by the Chinese and is frequently reprinted; but, excepting a revision and enlargement which it underwent in the fourteenth year of the Emperor Shun-chi, A.D. 1657, no attempt appears to have been made for the verification of old, or the acquisition of new, information. The Pun-tsaou is divided into 52 chapters, usually bound into about 40 thin octavo volumes, the first three of which contain woodcuts of many of the minerals, plants, and animals referred to in the text. These woodcuts, four of which occur on a page, amount in number to more than 1100; the name is placed above each, and sometimes a synonym at the side. No general translation of the Pun-tsaou into any European language has been published, though small portions of the work to illustrate particular subjects have frequently been translated. These extracts show that among much

[1] Like other Chinese names, it is written by Europeans in various manners, as, *Pen thsao kang mo*, *Pen tsao cang mou*, &c.

[2] *Description de l'Empire de la Chine*, Paris, 1735, fol. tome iii., p. 441.

that is interesting, there is a large admixture of the absurd and fabulous, so that it is questionable whether the labour of translating so voluminous a work in its integrity would be repaid by the value of the information acquired. It is much to be desired, however, that a list of the woodcuts should be drawn up and printed, together with the Latin names of such minerals, plants, or animals as can be identified. Such a list would form a convenient key to the Pun-tsaou, and although but a comparatively small number of the names might at first be determined, a basis would be laid for future labours.

860-62.

List of the woodcuts recommended.

To give some idea of the subjects treated in the Pun-tsaou, and the manner in which they are arranged, I have drawn up the synoptical table of its contents printed on the following page, which Professor Stanislas Julien of Paris has favoured me by examining and correcting.[1]

With regard to European works touching upon Chinese Materia Medica, the first to be mentioned is one entitled *Specimen Medicinæ Sinicæ*, published in 4to, at Frankfort, in 1682. This work, which was edited by Andrew Cleyer, a physician and botanist in the service of the Dutch East India Company, is a collection of Latin treatises, some of them being translations from the Chinese. A list of these treatises (not, however agreeing with the titles of the treatises themselves) is placed on the title-page. The author or translator of most, if not of all, of these works, was not Cleyer, but Michael Boym, a Polish Jesuit missionary, who went to China and India in 1643. After Boym's death in 1656, his MSS. were sent to Europe, where those constituting the work in question were published in 1682. Owing, however, to disagreements between the Dutch East India Company and the Jesuit missionaries, the name of Boym was suppressed, and the work appeared as edited by Dr. Cleyer, first physician to the Company. The treatises comprised in the

Specimen Medicinæ Sinicæ.

[1] I may also here acknowledge the information I have derived from Du Halde (*op. cit.* iii., 437—9), as well as from Mr. S. Wells Williams, in the comprehensive account of the Pun-tsaou given in his *Middle Kingdom*, vol. i. chap. vi. I have also to thank my friends Messrs. Lockhart and W. G. Stronach, who have kindly determined for me many points involving a knowledge of the Chinese language.

SYNOPSIS OF THE CONTENTS OF THE CHINESE HERBAL

本草綱目 *PUN-TSAOU-KANG-MŬH.*

Chap.				
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3. 4.	Lists of Medicines for the cure of all Diseases.			
5. 6. 7.	Waters, Fires, and Earths.			
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9.	.....I. Stones			23— 43
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20.		7.	Rock Plants	472— 490
21.		8.	Mosses and Lichens	491— 502
		9.	Miscellaneous Plants, and Plants having names, but not yet used in Medicine.	503— 525
22.	——————2nd Division, GRAINS	§ 1.	Hemp, Wheat, Rice, &c.	526— 535
23.		2.	Millet, Maize, &c.	536— 544
24.		3.	Leguminous Plants	545— 552
25.		4.	Alimentary Preparations [of a vegetable nature, and used in medicine, as boiled rice, yeast, soy, vinegar, wine, &c.]	
26.	—————— 3rd Division, CULINARY HERBS,	§ 1.	Plants having a strong odour and pungent taste [as garlic, mustard, ginger, &c.]	553— 576
27.		2.	Soft and Smooth plants [potherbs, as lettuce, chicory, mallow, &c.]	577— 606
28.		3.	Plants producing fruit upon the ground [as the gourd tribe]	607— 615
		4.	Aquatic Vegetables [as edible seaweeds]	616— 620
		5.	Fungi	621— 626
29.	——————4th Division, FRUITS	§ 1.	Cultivated Fruits.	627— 635
30.		2.	Hill Fruits	636— 664
31.		3.	Foreign Fruits	665— 684
32.		4.	Aromatic Fruits	685— 696
33.		5.	Fruits which grow on the ground, and have no kernels [as melons]	697— 702
		6.	Aquatic Fruits	703— 707
34.	—————— 5th Division, TREES	§ 1.	Aromatic Trees	708— 732
35.		2.	Stately Trees	733— 777
36.		3.	Bushy Trees	778— 821
37.		4	Parasitic Plants	822— 826
		5.	Flexible Plants and Trees [as osier, bamboo, &c.]	827— 829
		6.	Miscellaneous Trees.	
38.	On Garments and Domestic Utensils [appertaining to medicine.]			
39.	ANIMAL.....1st Division, INSECTS	§ 1.	Insects born from eggs	830— 859
40.		2.		
41.		3.	Insects produced by metamorphosis	860— 874
42.		4.	Aquatic Insects (including frogs)	875— 886
43.	—————— 2nd Division, SCALY ANIMALS	§ 1.	Dragons	887— 893
		2.	Serpents	894— 902
44.		3.	Fishes having scales	903— 932
		4.	—————— no scales	933— 953
45.	—————— 3rd Division, SHELLY ANIMALS,	§ 1.	Tortoises	954— 962
46.		2.	Mollusks	963— 985
47.	—————— 4th Division, BIRDS	§ 1.	Aquatic Birds	986—1007
48.		2.	Birds living upon open lands	1008—1026
49.		3.	——————in woods	1027—1042
		4.	Mountain Birds	1043—1052
50.	—————— 5th Division, HAIRY ANIMALS	§ 1.	Domestic Quadrupeds	1053—1064
51.		2.	Wild Animals	1065—1094
		3.	Rodent Animals	1095—1104
		4.	Monkeys	1105—1110
52.	—————— 6th Division, MAN (parts of the human body and human secretions and excretions employed in medicine.)			

* This series of numbers does not exist in the original. When added in MS. it affords a convenient and ready means of reference to any particular figure.

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Specimen Medicinæ Sinicæ relate chiefly to medical subjects, and especially to the Chinese doctrine of the pulse. One section, however, of 30 pages, attributed to Boym, is entitled *Medicamenta Simplicia quæ a Chinensibus ad usum medicum adhibentur.* It is an unclassified catalogue of 289 drugs, giving of each the Chinese name written after the Portuguese orthography, but without the Chinese characters; to this succeeds a brief description, chiefly as regards medicinal properties, which are expressed according to Chinese ideas. Occasionally the author is able to add the European name.

Chinese Section [Boym.]

Incomparably more important and useful than Cleyer's *Specimen* is a little work published at St. Petersburg in 1856, for a copy of which I am indebted to the kindness of Professor Horaninow. It is entitled *Catalogus Medicamentorum Sinensium quæ Pekini comparanda et determinanda curavit Alexander Tartarinov, Doctor Medicinæ, Medicus Missionis Rossicæ Pekinensis spatio annorum* 1840—1850. (Petropoli, 1856, 8vo.) It is, as its title implies, the catalogue of a collection of Chinese drugs obtained in Pekin by Dr. Tatarinov, physician to the Russian mission in that capital, which drugs, as we learn from the preface, were subsequently examined and for the most part determined by Dr. Paul Horaninow, professor of Materia Medica at St. Petersburg. With the exception of the title-page and preface, which are in type, the catalogue is in lithograph, and forms a thin octavo of 65 pages. The Chinese characters for each name are given, and their sound expressed both in Russian and English writing characters. The arrangement is alphabetical, according to the names written after the Russian orthography. The name of each drug, so far as it could be determined, is given in Latin without note or comment. The catalogue includes the names of 500 substances.

Tartarinov and Horaninow.

Although these two are the only European works with which I am acquainted that professedly treat of Chinese Materia Medica, there are some other valuable sources of information, which are too well known to require more than the briefest notice; such are the *Flora Cochinchinensis* of Loureiro, a work in which the medicinal properties of many plants of Southern

Loureiro's *Flora Cochinchinensis.*

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Kæmpfer's *Amœnitates.*

China are briefly noticed. The *Amœnitates* of the German botanist Kæmpfer, published in 1712, contains an important section of 145 pages upon Japanese plants, for many of which the Chinese characters with their Japanese sounds are given. Nor should I omit to mention an Index of Plants of Japan and China, published in 1852 by MM. Hoffmann and Schultes,[1] in which the Latin names of about 600 species are enumerated, together with their equivalents in Japanese and Chinese, the Chinese characters being given.

With regard to inorganic Materia Medica, some information as to the Chinese designations of various mineral substances may be gathered from Keferstein's *Mineralogia Polyglotta* (Halle 1849, 8vo, pp. 248); the Chinese words, however, are expressed only in Roman characters.

Mineral Drugs.

The mineral Materia Medica of the Chinese is such as one may expect to find among a people having no scientific acquaintance with chemistry. Numerous substances are employed which are devoid of all active medicinal properties, while others of great power are so administered that the dose must be extremely uncertain. Although most of their mineral drugs are used in the crude state, there are a few, such as the mercurials, which are the results of chemical operations that are evidently conducted with considerable skill.

In the following list I have thought it best to group the substances described under the simple headings of *Calcareous, Magnesian, Arsenical,* &c., instead of attempting any more scientific arrangement.

SULPHUR.

Sulphur.

倭硫黃 *Wei-lew-hwang;* Native Sulphur.—Kæmpfer states that it is found abundantly in Japan.

硫黃 *Lew-hwang;* Sulphur.—Cleyer, *Med. Simpl.*, No. 157; *Pun-tsaou*, Fig. 85. The specimen has been fused and partially crystallized; it has a greyish-yellow colour.

[1] *Journal Asiatique*, Oct., Nov., 1852.

SILICA. 1860-62.

白石英 *Pŏh-shĭh-ying;* Massive Quartz. — *Pun-tsaou,* Fig. 20. Silica.

ALKALINE SALTS.

硝 *Seaou;* Nitrate of Potash.—The Chinese distinguish several varieties, as *Pŏ-seaou, Wang-seaou, Ma-ya-seaou,* &c. Alkaline Salts.

鹹 *Kĕĕn;* Native Carbonate of Soda.—Dr. T. Martius has described this substance, a quantity of which was imported into Hamburg in 1845. It is said to be found on the Thibetan frontiers of China.[1]

硼砂 *Păng-sha;* Borax; Biborate of Soda.—An excellent sample of refined borax; probably imported in a crude state into China from Thibet, where, as is well known, it occurs in certain lakes. Borax is extensively used in China by silversmiths and coppersmiths.[2]

元明粉 *Yuen-ming-fun;* Sulphate of Soda.—It is in crystals, and obtained in all the northern and central provinces of China. M. Rehmann enumerates it in his catalogue of Thibetan medicines.[3]

磁砂 *Naou-sha;* Chloride of Sodium (a peculiar form).—The specimen which I have received under the above Chinese name is a small rounded fragment of a crystalline substance, of a greyish-green hue, which upon analysis proves to be nothing more than *chloride of sodium* contaminated with a little earthy matter. Such, however, it cannot be regarded by the Chinese, who from some fanciful idea, possibly derived from the locality whence it is obtained, imagine it possessed of great medicinal virtues, and pay for it at the extraordinary rate of 20 dollars (£5) the ounce.

[1] *Pharm. Journ. and Trans.*, vol. vi., p. 182.

[2] Dr. McCartee says that what is sold at Ningpo is exceedingly impure, a better article is sold under the name 月石 *yueh-shih*—moonstone.

[3] *Bulletin de Pharm.*, t. iii., p. 392.

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Naou-sha is stated by Keferstein to be a name for carbonate of ammonia and sal-ammoniac, but I have received neither of these substances from China.[1]

CALCAREOUS SUBSTANCES.

Calcareous Substances.

寒水石 *Han-shuy-shĭh;* Calcareous Spar (Carbonate of Lime); *Hân xiù xĕ*, Cleyer, *Med. Simpl.*, No. 160.—It consists of fragments of colourless crystals.

光粉 *Kwang-fun;* Levigated White Marble (Carbonate of Lime).—This substance is sold in the form of cakes, each weighing from two to three ounces, and inclosed in a little box. It is a remarkably pure form of carbonate of lime, and a very good specimen of careful levigation.

鐘乳石 *Chung-joo-shĭh;* Carbonate of Lime in stalactitic masses.—*Pun-tsaou*, Fig. 37. It is obtained from caves. The Chinese name signifies *Hanging-* (like a bell) *milk-stone.*

花蕊石 *Hwa-luy-shĭh;* a granular greenish-white Dolomite (Carbonate of Lime and Magnesia).

玄精石 *Heuen-tsing-shĭh;* Selenite (Sulphate of Lime).—*Pun-tsaou*, Fig. 80. Small lenticular crystals (sometimes twin-crystals), translucent, but having a dull exterior. They vary in diameter from $\frac{4}{10}$ to $\frac{2}{10}$ of an inch.

石膏 *Shĭh-kaou;* Fibrous Gypsum (Sulphate of Lime).—*Xĕ cāo*, Cleyer, *Med Simpl.*, No. 166; *Pun-tsaou*, Fig. 27.

紫石英 *Tsze-shĭh-ying;* Fluor Spar (Fluoride of Calcium).—*Pun-tsaou*, Fig. 21. In fragments of irregular size, and of a purple or greenish colour.

陽起石 *Yang-khe-shĭh;* Asbestous Tremolite; Silicate of Lime and Magnesia. *Pun-tsaou*, Fig. 44.—Irregular masses of a pale greenish colour.

[1] It is remarkable that in India Salammoniac is called *Naushadar.* See Baden H. Powell's *Handbook of the Economic Products of the Punjab*, p. 89.

MAGNESIAN AND ALUMINOUS SUBSTANCES.

Magnesian and Aluminous Substances.

銀精石 *Yin-tsing-shĭh;* Silvery-white Mica.—*Pun-tsaou* Fig. 54. I have also received a transparent green mica under the same name.

㸃㸃㸃 *Kin-tsing-shĭh;* Brown Mica.—*Pun-tsaou,* Fig. 54.

㸃㸃㸃 *Tsing-mung-shĭh.*—*Pun-tsaou,* Fig. 56.

㸃㸃㸃 *Kin-mung-shĭh; Cim̄ mûm xĕ,* Cleyer, *Med. Simpl.,* No. 154.

銀蒙石 *Yin-mung-shĭh.*—This substance, and the two preceding, are micaceous earths.

塊活石 *Kwei-hwŏ-shĭh;* Steatite or Soapstone; Silicate of Magnesia.—*Hwă-shĭh, Pun-tsou,* Fig. 31. A friable, greyish-white variety: the so called *Soapstone,* from which the Chinese often carve beautiful ornaments, is a silicate of alumina, known to mineralogists as *Agalmatolite.*

紅砂 *Hung-sha.*—This substance is in the form of coarse reddish-brown sand, which, when examined with a lens, is seen to consist of transparent angular fragments, mostly of a pale pinkish hue, mixed with some of a yellowish-brown, or more rarely greenish-black. Sp. gr. 3·848. Professor Guibourt considers it is probably some variety of garnet reduced to powder, and in the absence of positive information I have therefore placed it among the aluminous substances.

飛活石 *Fei-hwŏ-shĭh.*—An argillaceous earth, of a pale yellowish colour, soft to the touch, and formed into little, rectangular, oblong blocks.

赤石脂 *Chĭh-shĭh-che.*—An aluminous earth, of a pale pinkish colour, or white, in soft, friable, irregular masses. It has been examined by Mr. J. Morland, jun., whose analysis shows its composition to be nearly that of Kaolin. The two are as follows:—

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Magnesian and Aluminous Substances.

	Chĭh-shĭh-che	*Pure Kaolin*
Silica	42·93	46·5
Alumina	36·53	39·6
Oxides of Iron and Manganese (mostly Manganese)	4·85	—
Magnesia and Lime	·94	—
Water	14·75	13·9
	100·0	100·0

The *Chĭh-shĭh-che* contains also a trace of fluorine, which was calculated with the oxides of iron and manganese.

白礬 *Pĭh-fan;* Alum.—*Pun-tsaou,* Fig. 86.

ARSENICAL SUBSTANCES.

Arsenical Substances.

信石 *Sin-shĭh;* Arsenious acid, also called *Pĭh-sin* and *Hung-pe.*—Of the specimens which I have received, some are apparently a natural mineral, constituting a translucent, crystalline mass, varying in colour from pure white to a yellowish brown or grey. Other specimens have the aspect of the ordinary massive white arsenic of European commerce.

Native Orpiment.

雌黃 *Tsze-hwang;* Yellow Sulphuret of Arsenic; Native Orpiment; *Pun-tsaou,* Fig. 26.—It occurs in the province of Yunnan; probably also in Burmah, as it has been shipped in considerable quantity from Moulmein. Ainslie states that it is exported from China to India.[1]

Orpiment is resorted to by the Chinese in cases of ague, but compounded in a manner so absurd as to render the dose extremely uncertain or even a nonentity.

Realgar.

雄黃 *Heung-hwang;* Native Red Sulphuret of Arsenic; Realgar: *Hiûm hoâm,* Cleyer, *Med. Simp.,* No. 176.—It is found in the province of Yunnan,[2] in the south of China, and has been exported in small quantity to London from Canton. Realgar is also sometimes imported into England from Bombay.

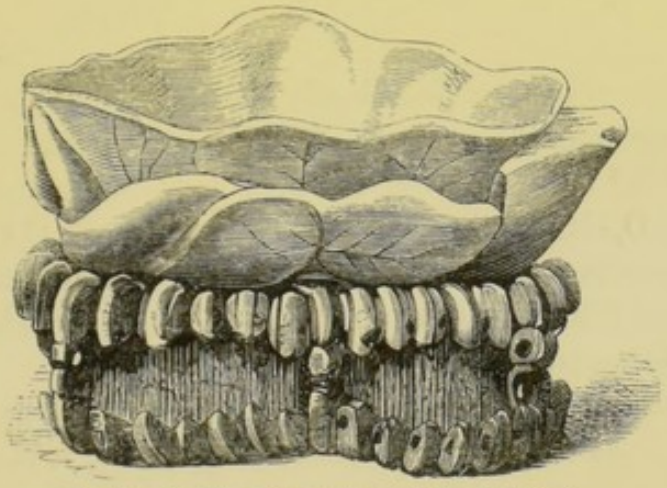
[1] *Mat. Med. of Hindostan,* p. 53.

[2] Du Halde says that it is brought from the province of *Chensi.—Descript. de la Chine,* t. i. p. 207.

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Realgar Medicine Cups.

Small shallow cups, elegantly carved out of this mineral, and often highly polished, are used by the Chinese for administering certain medicines; by which means, when the inner surface of the cup is, as sometimes happens, in a somewhat disintegrated condition, it is evident that a minute dose of arsenic may be administered. One of these cups, with its fanciful wooden stand, is represented in the annexed woodcut. Other carvings, but of a purely ornamental nature, are also manufactured from realgar by the Chinese, and from their magnificent red colour and fine polish, are often of considerable beauty. A realgar medicine cup brought to Paris by the Siamese ambassadors in 1684 was examined chemically by Homberg.—*Hist. de l'Acad. Roy. des Sciences* (*de Paris*) année 1703, p. 51.



Realgar Medicine-Cup on Carved Wooden Stand.

紅信 *Hung-sin;* Red Sulphuret of Arsenic with Arsenious Acid.—A native mineral, constituting a highly crystalline, striated mass, of a red or pinkish colour, mottled with white,—passing in places into a steel grey. It is composed of Red sulphuret of arsenic with a large proportion of arsenious acid. The dark parts are probably due to metallic arsenic.

COMPOUNDS OF ZINC, LEAD, AND COPPER.

Zinc Bloom.

浮甘石 *Fow-kan-shĭh*, also called *Loo-kan-shĭh;* Zinc Bloom. Dana, *Syst. of Mineralogy*, ed. 4, vol. ii., p. 460.—An opaque white mineral, easily broken and marking the fingers

1860-62. like chalk. It consists chiefly of fragments of a botryoidal crust, showing, when broken, a glistening, fibrous, radiating structure, sometimes divided into bands or layers slightly stained with oxide of iron. Mr. J. D. Perrins, of Worcester, who has obligingly examined the mineral for me, found its specific gravity (taken with precautions to deprive it of the air in its pores) to be 2·67. Mr. Perrins's analysis gave its composition as follows :—

Perrins's analysis.

Oxide of Zinc	72·64
Carbonic Acid	14·95
Water	10·63
Carbonate of Lead	1·78
	100·00

From these results, which closely approximate to those obtained by Smithson from the analysis of a similar mineral from Bleiberg, in Carinthia,[1] the following formula may be deduced :—$ZnO, CO_2 + 2(ZnO,HO)$, with an admixture of PbO,CO_2. Zinc Bloom, according to Dana, occurs with ores of zinc and lead at Bleiberg and Raibel in Carinthia, where it has probably resulted from the decomposition of calamine.

Zinc Bloom.

The Chinese mineral is from the southern province of Kwang-si. As found in the native drug-shops, it occurs chiefly in pieces of from one-quarter to one inch in length. Larger pieces which are perfectly white, are worth 400 *cash* the tael, which equals about one shilling per ounce.

Litharge. 密陀僧 *Meĭh-to-sang ;* Litharge (Oxide of Lead).—*Pun-tsaou,* Fig. 8 ; Cleyer, *Med Simpl.,* No. 168.

Red Lead. 韋丹 *Wei-tan ;* Red Oxide of Lead ; Red Lead.

東丹 *Tung-tan ;* a dull red powder, consisting chiefly of Red Lead and Carbonate of Lime.

[1] Chemical Analysis of some Calamines, by James Smithson, Esq., F.R.S. —*Nicholson's Journal,* vol. vi. (1803), p. 74.

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鉛粉 *Yuen-fun;* Carbonate of Lead; White Lead. Prepared at Canton and Soo-chow. A compound plaster, of which carbonate of lead and oil are the chief ingredients, is used by the Chinese. White Lead.

銅綠 *Tung-lŭh;* Carbonate of Copper (*artificial*).—It occurs in the form of small rectangular cakes of a pale, green colour, opaque and friable. Copper Carbonate.

FERRUGINOUS SUBSTANCES.

鹽生 *Yen-săng;* Magnetic Oxide of Iron.—A coarse, black, sand-like powder, strongly attracted by the magnet. Iron Compounds.

靈磁石 *Lin-tsze-shĭh;* Magnetic Iron Ore. *Pun-tsaou,* Fig. 45.

自然銅 *Tsze-jen-tung;* Per-oxide of Iron in cubic masses more or less broken.—It appears to have been obtained by calcining iron pyrites. *Pun-tsaou,* Fig. 5.

代赭石 *Tae-choo-shĭh;* Red Hæmatite; Per-oxide of Iron. *Pun-tsaou,* Fig. 46. It has the form of botryoidal concretions, with a scaly fracture, and ferruginous, metallic appearance.

禹粮石 *Yu-leang-shĭh;* Brown Clay Iron Ore.—Nodular concretions resembling the *Lapis Ætites* of old European Pharmacy, a mineral which, to use the words of Geiger, "*olim dementer ad partum promovendum adhibebatur.*"

無名異 *Woo-ming-e;* Hydrous Peroxide of Iron in rounded grains; Limonite.—*Pun-tsaou,* Fig. 34. This substance consists of rounded grains, varying in size between coarse sand and mustard-seeds, with occasional grains still larger. Some of them have a dark, polished surface, and metallic appearance, but the majority are brown in colour, and are more or less dull, when pulverized their colour is ferruginous. They are not attracted by the magnet. An analysis by my friend, Mr. J. Morland, jun., shows them to have the following composition:—

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Peroxide of Iron	63·47
Sesquioxide of Manganese .	3·55
Silica	15·55
Alumina	4·98
Do., with trace of Phosphates.	1·12
Water	11·07
	99·74

Dr. Ure mentions a pisiform variety of Brown Clay Iron Ore in small solid spherical grains, which is used in Dalmatia as shot. The Chinese mineral is found in the provinces of Szechuen and Kwangtung.

蛇含石 *Shay-han-shĭh;* Nodular Iron Pyrites, more or less passed into the condition of per-oxide.

膽礬 *Tan-fan;* Green Sulphate of Iron; Cleyer, *Med. Simpl.*, No. 164.

綠礬 *Lŭh-fan;* Green Sulphate of Iron.—*Pun-tsaou,* Fig. 87. It is in the state of coarse powder.[1]

MERCURIAL COMPOUNDS.

水銀 *Shŭy-yin;* Mercury.—*Pun tsaou,* Fig. 24.

紅升葯 *Hung-shing-yŏ;* Nitric Oxide of Mercury; Red Precipitate.—A heavy powder, of an orange-red colour, leaving no appreciable residue upon being heated to redness. It contains a little nitrate of mercury, but no arsenic.

輕粉 *King-fun;* Chloride of Mercury; Calomel.—My specimen of the substance called *King-fun*, consists of small, brilliant, colourless, transparent crystals, mostly thin and plate-like, or even pectinated; some are needle-shaped. Chemical examination proves it to consist of two distinct substances, namely, Chloride of Mercury and Sulphate of Lime. The

[1] Dr. McCartee says that at Ningpo what is sold as *Lŭh-fan* "seems to be Sulphate of Copper."—Letter to D. H., 5 Dec., 1867.

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Chinese Calomel.

chloride is in a state of great purity and beautifully white. The sulphate of lime is in minute, transparent, acicular crystals, to the naked eye perfectly simulating the chloride of mercury, which it is ingeniously used to adulterate. The proportion in which the two salts exists is not readily determined, as it is impossible to obtain a uniform mixture for experiment without powdering the entire specimen. From three experiments, however, it appears that sulphate of lime constitutes at least a fourth part of the specimen of Chinese calomel under notice.[1]

King-fun is mentioned by Cleyer as *E kiṁ fuèn*, and supposed by him to be a natural production, a suggestion quite inadmissible as regards my specimen. Mr. Lockhart informs me it is brought from the province of Gan-hwuy, but of the locality where it is manufactured, and of the process, I am quite ignorant. The Mongols are said to purchase *sublimate* of the Russians:[2]—perhaps by this we may understand *calomel* also. The Chinese appear to have a correct notion of the use of calomel as a purgative, and they also employ it in the form of ointment in cases of ulcer, to cleanse and produce a free purulent discharge.

Cinnabar.

硃砂 *Choo-sha;* **丹砂** *Tan-sha;* Cinnabar; Red Sulphuret of Mercury.—*Pun-tsaou*, Fig. 23; Cleyer, *Med. Simpl.*, No. 177. This mineral has been regarded by the Chinese as the *Philosopher's Stone*, and most extravagant ideas have been entertained respecting it. The Rev. J. Edkins in a communication recently laid before the China Branch of the Royal Asiatic Society[3] has pointed out that alchemy was pursued in China long previous to its being known in Europe,—in fact, that for two centuries prior to the Christian era, and for four or more subsequent, the transmutation of the base metals into gold, and the composition of an elixir of immortality, were questions

[1] See F. Porter Smith on Chinese Chemical Manufactures in *Ph. J.* June 22, 1872, p. 1031, who refers to Davis's *Chinese*, vol. iii., for some account of making calomel.

[2] *Bull. de Pharm.*, iii., p. 387.

[3] *Transactions of the China Branch of the Royal Asiatic Society* (Hong Kong), Part 5, 1855, Art. iv.

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ardently studied by the Chinese. It is moreover a matter of history that intercourse between China and Persia was frequent both before and after the Mohammedan conquest of the latter country; that embassies from Persia, as well as from Arabs, and even from the Greeks in Constantinople, visited the court of the Chinese emperor in Shansi; that Arab traders settled in China, and that there was frequent intercourse by sea between China and the Persian Gulf; that China had an extensive alchemical literature anterior to the period when alchemy was studied in the West. All these facts go to prove that that pseudo-science originated not with the disciples of Mohammed, but that it was borrowed by them from the Chinese.

Philosopher's Stone.

With regard to the philosopher's stone, it is remarkable that while the alchemists of the West have spoken with doubt as to what it was, with the Chinese its identity appears hardly to have been questioned. That wonderful body which, when used as a chemical agent, was supposed to have the power of converting other metals into gold, and, when employed as a medicine, of conferring immunity from death, is, according to the writings of the Chinese alchemists, *Cinnabar*. Marco Polo notices this idea, that sulphur and mercury are capable of prolonging life. Of the *Cingui* (*i.e. Chugi*, the Jogis in India), he says:—"These are longer lived than other people, for they live from 150 to 200 years . . . . for I tell you they take quicksilver and sulphur, and they mix them together and make a drink of them . . . . and they say that it lengthens their life . . . . and they do this twice every month . . . . These people use this drink from their infancy, in order to live longer, and without fail, those who live so long as I have told you, use this drink of quicksilver and sulphur."—Quoted in the Art. "Marco Polo and his Recent Editors," in *Quarterly Review*, July 1868.

Marco Polo.

Ko-hung, author of the *Pau p'uh tsi p'ian*, a work of the fourth century of undoubted genuineness, enumerates various mineral and vegetable productions possessing in different degrees the properties of an *Elixir Vitæ*. Of the first of them, Cinnabar, he writes in terms thus translated by Mr. Edkins:—

Elixir Vitæ.

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Cinnabar.

When vegetable matter is burnt, it is destroyed, but when the *Tan-sha* (cinnabar) is subjected to heat, it produces, mercury. After passing through other changes, it returns to its original form. It differs widely, therefore, from vegetable substances, and hence it has the power of making men live for ever, and raising them to the rank of the genii. He who knows this doctrine, is he not far above common men? In the world there are few that know it, and many that cavil at it. Many do not even know that mercury comes out of cinnabar. When told, they still refuse to believe it, saying that cinnabar is *red*, and how can it produce a *white* substance? They say also that cinnabar is a stone,—that stones when heated turn to ashes, and how then can anything else be expected of cinnabar? They cannot even reach this simple truth, much less can it be said of them, that they have been instructed in the doctrine of the genii. . . . . .

Monopoly in the Cinnabar trade.

The specimens of cinnabar which I have received are in small crystalline fragments and very pure. According to Kæmpfer,[1] both native and artificial cinnabar are exported from China to Japan, the artificial being used by the Japanese as a colour and the native being employed in medicine. The same author tells us that in his time the buying and selling of cinnabar was a monopoly of certain merchants, in virtue of letters patent granted by the emperor.

Vermilion.

銀硃 *Yin-choo;* Vermilion; Levigated Red Sulphuret of Mercury.—The process for preparing vermilion is described by an old Chinese author to be as follows:—1 lb. of mercury and 2 lbs. of sulphur are triturated together until they form a blackish powder, which is put into a crucible, closely covered with an iron lid and luted down. The heat of a wood fire is then applied, the lid being kept cool by something wet. The sublimation is thus effected, 1 lb. of mercury usually producing 14 ozs. of cinnabar of the first quality, and 3½ ozs. of the second. In the Library of the India House (London) is a series of beautiful native drawings representing the preparation of vermilion by the Chinese.

[1] *Hist. of Japan*, Lond., 1727. Vol. i., p. 113.

1860-62. Chinese vermilion is an article of regular importation into London, where the finer qualities realize from 3*s.* 3*d.* to 3*s.* 6*d.* per lb.

Nitrate of Mercury. 黃升藥 *Hwang-shing-yŏ;* Nitrate of Mercury with some Peroxide.—A pale buff powder, wholly volatile.

FRUITS AND SEEDS.

Fruits and Seeds. 花椒 *Hwa-tseaou;* Fruits of *Zanthoxylum* (*Rutaceæ*, tribe *Zanthoxyleæ*); *Hoa-tsiao*, Guibourt, *Hist. des Drog.*, t. iij., p. 514. —*Japanese Pepper*, Stenhouse, *Phil. Mag.*, 4th series, vol. vii. (1854), p. 23; *Pharm. Journ. and Trans.*, vol. xvii., p. 19; *Pun-tsaou*, fig. 685.

Hwa-tseaou is a name applied to the fruits of two species of *Zanthoxylum*, namely, *Z. piperitum*, D.C., and *Z. alatum*, Roxb.[1] The first is a native of Japan, in which country its fruits are used as a condiment; the second is indigenous to India and China, and, as proved by specimens obtained by my brother, Thomas Hanbury, of Shanghai, is the source of the *Hwa-tseaou* of the Chinese shops.

Zanthoxylum alatum. *Zanthoxylum alatum*, first noticed by Capt. Hardwicke, in 1796,[2] is a small tree occurring in various parts of Northern India, as in Oude, Rohilcund, Kumaon, Nepaul, Sikkim, Bhotan, and Khasia, and extending far eastward into China. As may be expected from so extensive a range, it varies considerably, especially as to the size of its leaves and number of its leaflets and the number and size of its spines; but the transition from one form to another is so gradual that no botanist who should examine a large series of specimens could doubt their belonging to a single type.

The fruits (Fig. 1), as found in the Chinese shops, consist of the carpels usually dehiscing and empty, but sometimes inclosing the round, black, shining seed. In perfect specimens we

[1] I retain Roxburgh's name for this plant, because I am certain of its identity. Steudel supersedes it by that of *Z. acanthopodium*, D.C.; but this latter is not identical, at least according to M. Alphonse de Candolle, who, at my request, has kindly compared it with specimens of *Z. alatum*, Roxb., from China.

[2] *Asiatick Researches*, vol. vi., p. 376.

find a slender pedicel supporting the carpels, which are nominally four in number, but of which at least one or two are mostly abortive. The carpels are oval or nearly spherical, $\frac{2}{10}$ths of an inch in longest dimension; externally they are of a bright reddish-brown, covered with prominent tubercles filled with oleo-resin; internally they are furnished with a hard, papery, white membrane, which becomes loose, contracts and curls up when the seed falls. The drug has a peculiar aromatic taste, and, when crushed, an agreeable and highly aromatic odour— 1860-62.



Fig. 1.

properties due to the oleo-resin contained in the outer part of the carpel.

The fruits of *Zanthoxylum alatum*, Roxb.,[1] have been subjected to chemical analysis by Dr. Stenhouse, who has obtained from them by distillation:— Analysis of *Z. alatum* by Dr. Stenhouse.

1. An essential oil, to which the aromatic properties are chiefly due. This oil, which when pure is called by Dr. Stenhouse *Xanthoxylene*, is a hydrocarbon isomeric with oil of turpentine. It is colourless, refracts light strongly, and has an agreeable aromatic odour; its composition is C_{10} H_8.

2. *Xanthoxylin*, a stearopten found floating on the water, distilled from the seeds, and also separable from the crude essential oil. *Xanthoxylin.*

After repeated crystallizations from alcohol, xanthoxylin may be obtained in a state of purity, and then presents the form of large crystals of a fine silky lustre, insoluble in water, but readily soluble in alcohol or ether. It has a very slight odour of stearine, and a slightly aromatic taste. It distils unchanged; its fusing point before and after distillation remaining the same,

[1] Erroneously supposed at the time to be those of *Z. piperitum*, D.C.

1860-62.

namely 176° F., and its solidifying point 172·4° F. Its composition is C_{40} H_6 O_4.

Fagara minor.

The fruits of *Zanthoxylum alatum* are used in China as well as in India as a condiment. The *Fagara* or *Fagara minor* of the old pharmacologists [1] is probably referable to this species.

白蒺藜 *Pih-tseih-le;* Carpels of *Tribulus terrestris,* L. (*Zygophylleæ*); *Pĕ-ciĕ-lî,* Cleyer, *Med. Simp.,* No. 28; *Pun-tsaou,* Fig. 322.—These little spiny carpels have slightly astringent properties. Loureiro states that they are beneficial in *hæmorrhagia narium* and in dysentery; also as the basis of a gargle in tenderness of the gums, and in ulcers and inflammation of the mouth and throat.

The herb was formerly official in Europe, but is now obsolete.

巴豆 *Pa-tow;* Fruits of *Croton Tiglium,* Lam. (*Euphorbiaceæ*); *Pā-teú,* Cleyer, *Med. Simp.,* No. 224.

The seeds, from their drastic purgative properties, are regarded by the Chinese as extremely poisonous.

Strychnos Ignatia.

呂松菓 *Leu-sung-kwo;* Seeds of *Strychnos Ignatia,* Juss. (*Loganiaceæ*); Saint Ignatius's Beans.—These well-known seeds are imported from the Philippines, in the Bisayas provinces of which islands the tree which affords them is stated by Blanco, the author of the *Flora de Filipinas,* to be common. But neither this botanist nor any other has been able, that I am aware of, to procure complete specimens of the tree, so that it is as yet undescribed.

Muricia Cochinchinensis.

木鼈子 *Muh-pĕĕ-tsze,* also called *Fan-muh pĕĕ;* Seeds of *Muricia Cochinchinensis,* Lour. (*Curcurbitaceæ*); *Pun-tsaou,* Fig. 387 and 386; *Mŏ-pĕĕ-cù,* No. 188, Cleyer.—Orbicular or obscurely triangular compressed seeds (Fig. 2), tubercled at the margin, and having a dark brown, fragile, rugose testa, frequently marked with depressed reticulations; in diameter they vary from $\frac{3}{4}$ to $1\frac{1}{4}$-inch. The yellow cotyledons within are extremely oily.

[1] *Vide* Dale, *Pharmacologiæ Suppl.,* Lond., 1705, p. 298; also Chabræus, *Stirpium Sciagraphia,* Genev., 1677, p. 26.

1860-62. Chinese Seeds.

According to Loureiro, the seeds and leaves of *Muricia Cochinchinensis* are aperient, and useful in the treatment of tumours and malignant ulcers, and of obstructions of the liver and spleen. The plant is a native of China and Cochin-China;

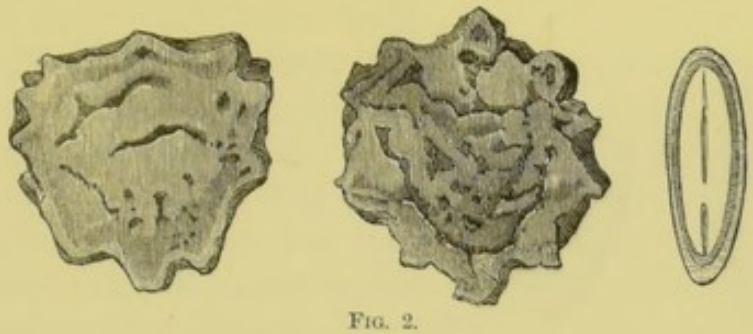


Fig. 2.

it is not enumerated in the Flora of Hong Kong,[1] and, I believe, has not been obtained by any collector in recent times. There is an indifferent specimen of Loureiro's in the British Museum.

決明子 *Keuĕ-ming-tsze;* 草決明 *Tsaou-keuĕ-ming;* seeds of *Cassia Tora*, L. (*Leguminosæ*).—Tatarinov, *Catal. Med. Sinens*, p. 5; Ainslie, *Mat. Indica*, vol. ii., p. 405. *Cassia Tora.*

Seeds of a cylindrical form, 2 to 3 lines long, pointed at one extremity, rounded at the other, of a dark brown colour, with two light stripes on opposite sides.

石栗 *Shĭh leĭh;* Seeds of *Aleurites triloba*, Forst. (*Euphorbiaceæ*); *Juglans Camirium*, Loureiro.—The kernel of the seed yields abundance of oil. *Juglans Camirium.*

楮實子 *Choo-shĭh-tsze;* the small seed-like nuts or achenes of *Brousonetia papyrifera*, Vent. (*Moreæ*), Paper Mulberry Tree. *Brousonetia papyrifera.*

These are roundish seed-like bodies, somewhat smaller than the seeds of white mustard, slightly compressed and keeled on one side, of a pale brown, or, when fresh, orange colour. The fleshy part of the compound fruit is saccharine and edible; what virtues the seeds are supposed to possess I do not know. The

[1] Bentham, *Flora Hongkongensis*, Lond., 1861, 8vo.

1860-62. Chinese Fruits.

inner bark of the tree is used in Japan for the manufacture of paper, as is fully described by Kæmpfer.[1]

使君子 *She-keun-tsze;* Fruit of *Quisqualis indica* (L. *Combretaceæ*); *Pun-tsaou*, Fig. 385.

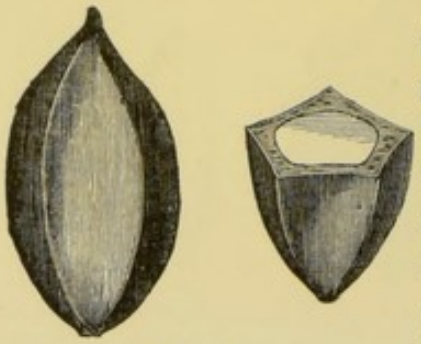


Fig. 3.

Quisqualis indica as an anthelmintic.

These fruits (Fig. 3) are about an inch in length, oval or oblong, pointed at either extremity, and sharply pentagonal. The woody pericarp is thin, fragile, and of a deep mahogany colour and incloses an oily seed. Loureiro states that the seeds used daily are recommended as an anthelmintic and in the rachitis of children.[2] Their anthelmintic properties, though recorded by Rumphius and several subsequent writers besides Loureiro, have not attracted much attention in Europe. Recently, however, Dr. E. J. Waring, of Travancore, has published a paper on some of the principal indigenous anthelmintics of India, in which he has quoted some favourable reports of the properties of the seeds in question.[3] From these it appears that the seeds are chiefly used against *lumbrici*, especially when occurring in children. They are sometimes given almost *ad libitum*, but generally the dose of four or five good seeds is found to be sufficient.

Chebulic Myrobalans.

訶子 *Ho-tsze* 柯勒黎 *Ko-lih-le;* Fruits of *Terminalia Chebula*, Roxb. (*Combretaceæ*); Chebulic Myrobalans.

Astringent Purgative.

These fruits are well known in English commerce on account of their astringent properties, which render them valuable in various processes of dyeing. In medicine they have been held in esteem for ages, not only on account of their astringency, but also from their mildly purgative properties. Hill remarks that when given in substance they do not exert their purgative faculty at all, but are astringent only, whereas when admin-

[1] *History of Japan* (Scheuchzer's translation), Lond., 1727, Appendix, p. 22.

[2] *Flor. Cochinch.*, p. 337.

[3] *Indian Annals of Medical Science*, No. 12 (1860).

istered in infusion or decoction they open the bowels in a very gentle and easy manner.[1] In China, Europeans, I am informed, occasionally have recourse to myrobalans as an aperient—at the instance, I suppose, of native practitioners. The dose is from 2 to 4 drachms in infusion.

蒼耳子 *Tsang-urh-tsze;* Fruits of *Xanthium strumarium*, L. (*Compositæ*) Bentham, *Flor. Hongkong*, p. 181; *Pun-tsaou*, Fig. 252; *Çam'lh çù*, Cleyer, *Med. Simp.*, No. 114; Kæmpf. *Amœn.*, p. 892.

Xanthium strumarium, an almost ubiquitous weed in temperate and warm climates, is found both in China and Japan. Its leaves, under the name of *Herba Lappæ minoris*, were formerly official in Europe, and were administered internally in scrofula, herpes, &c., and externally as an application to scrofulous tumours.[2]

Herba Lappæ minoris.

蛇床子 *Shay-chwang-tsze;* Fruits of *Cnidium Monnieri;* Cusson (*Umbelliferæ*).—*Xĕ choâm çù*, Cleyer, *Med. Simp.*, No. 37; *Pun-tsaou*, Fig. 157.

Minute ovoid umbelliferous fruits; mericarps, with very prominent equal ribs, one vitta between each; commissure bivittate.

Cnidium Monnieri has been found by the Russian botanists in inundated spots on some of the islands of the Amoor, where, however, it does not appear to be a common plant. It also occurs in the neighbourhood of Pekin.[3]

Cnidium Monnieri.

榧實 *Fe-shĭh;* Seeds of *Torreya nucifera*, S. et Z. (*Taxineæ*); *Taxus nucifera*, L.; *Podocarpus nucifer*, Loud.—*Fey-tsy*, Tatarinov, *Catal. Med. Sin.*, p. 23; *Fi vulgò Kaja*, Kæmpf. *Amœn*, p. 814, Fig. p. 815; *Pun-tsaou*, Fig. 672.

From 1 to 1½ inch long, ovoid or oblong, cylindrical, pointed at the upper extremity, less so at the lower. The testa is of a

[1] *History of the Mat. Med.* Lond., 1751. 4to, p. 503. Myrobalans were included in the *Materia Medica* of the London Pharmacopœia down to the year 1721.

[2] Murray, *App. Medicam.*, vol. i. (1793), p. 212; Geiger, *Pharm. Univers.* (1835), i., p. 128.

[3] Maximowicz, *Primitiæ Floræ Amurensis* (1859), pp. 126, 472.

1860-62. Chinese Seeds.

cinnamon-brown colour, woody and fragile, marked longitudinally with broad, shallow striæ, and having a smooth scar at the base, near to which, and opposite each other, are two small oblong prominences. The nucleus, which is deeply corrugated, is covered by a thin brown membrane; its base is marked by a conspicuous cicatrix.

The seeds of *Torreya nucifera* are eaten like hazel nuts, and although reputed somewhat laxative, are considered wholesome. In Japan an oil is expressed from them, which is used for culinary purposes.

白菓 *Pih-kwo;* 銀杏 *Yin-hăng* (*Silver-almond*); Seeds of *Salisburia adiantifolia*, Sm. (*Taxineæ*).—*Gingko biloba*, L.; Gingko, arbor nucifera folio adiantino, Kæmpf. *Amæn*, p. 811; *Pun-tsaou*, Fig. 658.

Salisburia adiantifolia.

These are nut-like, oval pointed seeds, from ½ an inch to an inch long, keeled lengthwise on two sides, and having a smooth, fragile, bony, pale brown, outer shell or testa. The nucleus of the seed consists of amylaceous albumen inclosing a pair of long, narrow cotyledons, the whole enveloped in a delicate reddish-brown membrane.

Salisburia adiantifolia is commonly cultivated both in China and Japan, where it attains a large size. The male plant was introduced into Europe about a century and a half ago; the female much more recently. The tree is not uncommon in gardens; and in the warmer part of the Continent it ripens its handsome, plum-like, yellow fruits perfectly. The seeds, Kæmpfer tells us, are eaten to promote digestion "ac tumentem ex cibo ventrem laxare!" The pulp, which has a penetrating offensive smell of butyric acid, has been chemically examined by Dr. Schwarzenbach,[1] who has extracted from it by means of ether a peculiar crystallizable fatty acid, which has been named *Gingkoïc acid*, and which has the composition $C_{48}\ H_{47}\ O_3 + HO$. Gingkoïc acid forms tufts of acicular crystals, which have not been obtained colourless, but are of a brownish yellow; it is easily soluble in alcohol or ether, and exhibits in either case

Gingkoïc acid.

[1] *Vierteljahresschrift für Praktische Pharmacie*, Bd. vi., 424.

1860-62. Chinese Fruits.

a strong acid reaction. It fuses at 95° F., and congeals at 50°. Heated with solution of potash, it formed a soap-like compound. The other constituents of the pulp are pectin, gum, glucose, citric acid, and chlorophyll.[1]

大海子 *Ta-hai-tsze;* Fruits of *Erioglossum?* or *Nephelium?* (*Sapindaceæ*); *Boa-tam-paijang*, Guibourt, *Hist. des Drogues*, tome iii., page 543, *Bungtalai* (otherwise written *Poung-ta-rai*) of the Siamese.[2]

This fruit is of some interest as having been introduced into France about twenty years ago as a certain specific in diarrhœa and dysentery. Its claims to this character, which were tested in the Hôpital Beaujon in Paris, did not however hold good, no results being obtained from its use, but such as were attributable to the effect of repose, diet, and a mucilaginous beverage. But the drug had the merit of an unknown origin, a barbarous name, and a very high price,[3] and notwithstanding the unfavourable report made upon it by those officially appointed to give it a trial, it continued for some time to be prescribed.

Boa-tam-paijang vel *Bungtalai.*

Boa-tam-paijang, for such is the name under which it was introduced into Europe, though in Bangkok, whence I have received specimens, it is better known as *Bungtalai*, is produced in Cambodia, from a tree which has not at present been botanically determined. Sir Robert H. Schomburgk, British Consul at Bangkok, succeeded in obtaining fresh seeds which germinated, but the young plants thus raised perished before attaining maturity. The leaves which Sir Robert sent me are about 5 inches long, *simple*, entire, oblong or ovate, acuminate, rounded or subcordate at the base, and perfectly glabrous on both

[1] In the *Annales de Chimie et de Physique* for March, 1864, M. Béchamp publishes a paper on the existence of several odoriferous and homologous fatty acids in the fruit of *Gingko biloba*, L. He has found therein, formic, acetic, propionic, butyric, valeric, caproic, and caprylic acids, butyric, acetic and caproic predominating. *Chem. News*, May 7, 1864, p. 226.

[2] Are they not the "*Lukkrabow Seeds*," of which 48 piculs are reported as shipped from Bangkok (all to Hong Kong) in 1871? *Commercial Reports of H. M. Consul-General in Siam for* 1871, p. 6. They are actually the seeds of *Scaphium scaphigerum*, Wallich. See my note in *Pharm. Journ.*, iv. (1863) p. 109.

[3] In the wholesale price list of MM. Menier, druggists, of Paris (1854), it is quoted at 200 francs per kilogramme, *i.e.* £3 13*s.* per lb.

1860.62. Chinese Fruits.

sides. The fruits, as found in commerce (Fig. 4), are from $\frac{3}{4}$ to $1\frac{1}{4}$ inch long, ovoid, usually somewhat elongated at the lower extremity, which terminates by a large oblique cicatrix. Externally they are of a dark brown, deeply wrinkled, though generally less so at the superior extremity. The pericarp, which is from $\frac{1}{10}$ to $\frac{1}{20}$ of an inch in thickness, consists of a thin epidermis, beneath which lies a dry, black resinous-looking pulp, surrounding a fragile shell lined with a whitish membrane (the testa of the seed ?). The central part of the fruit is occupied by two cotyledons, which in their dried and shrunken state are thin and concave: the radicle is inferior, very short and turbinate. When the fruit is macerated in water, its outer shell or pericarp increases enormously in volume, forming a large gelatinous mass.[1]



FIG. 4. (The right hand figure represents a fruit cut longitudinally.)

It is this mucilaginous property that confers a value on the fruit in the eyes of the inhabitants of China and Siam, in both which countries the jelly is sweetened and eaten as a delicacy.

Guibourt's analysis of *Boa-tam-paijang.*

Boa-tam-paijang has been analyzed by Professor Guibourt, and found to consist of the following substances :—

In the pericarp.

Green oil	1·06	64·90
Bassorine	59·04	
Brown astringent matter and Mucilage	1·60	
Woody fibre and epidermis	3·20	

In the nucleus.

Fatty matter	2·98	35·10
Saline and bitter extract	0·21	
Starch and Cellular tissue	31·91	
		100·00

[1] Sir R. H. Schomburgk has been told that where the trees grow by a road-side, their fruits sometimes drop to the ground so abundantly, that if

槐實 *Hwae-shǐh;* Legumes of *Sophora Japonica*, L. (*Leguminosæ*). 1860-62.

Sophora japonica is a tree of very common occurrence in China and Japan, and not unfrequent in the gardens of Europe. Its flowers, called *Hwae-hwa*, are largely used in China for dyeing yellow, or rather for rendering blue cotton green,[1] and the legumes are said by Endlicher to have a similar application.[2] *Sophora japonica.*

These latter, in the dried state, are from 1 to 4 inches long by $\frac{3}{10}$ to $\frac{4}{10}$ of an inch wide, wrinkled, fleshy, semi-transparent, more or less contracted between the seeds, which usually do not number more than six in each legume.

皂角 *Tsaou-keŏ;* Legumes of *Gleditschia Sinensis*, Lam. (*Leguminosæ*); *Mimosa fera*, Lour.; Tatarinov, *Catal. Med. Sin.*, p. 57. Chinese Legumes.

The valves of the broad, flat pods are regarded, according to Loureiro, as attenuant, stimulant, and purgative. They are also lauded for their effects in the removal of phlegm and other viscid humours, and in the form of a sternutatory or suppository are said to be peculiarly efficacious in apoplexy, hemiplegia, and paralysis.

補骨脂 *Poo-kwŭh-che;* Legumes of *Psoralea corylifolia*, L. (*Leguminosæ*); *Pun-tsaou*, Fig. 177. *Psoralea corylifolia.*

These are flat, oval or reniform, black, one-seeded legumes, which being very small and indehiscent may readily be mistaken for seeds; they are about two lines long, and are sometimes surrounded by the calyx, which is 5-lobed and marked with prominent nerves and minute glands. The fruits of this *Psoralea* have an aromatic flavour, and are used in India (of which country the plant is a native) as a stomachic, as well as in certain inveterate cutaneous diseases.[3]

they become wetted with rain, such a mass of glutinous jelly is formed as to render the passage of the road on foot or horseback a matter of difficulty.

[1] Martius on *Wai-fa*, the flower-buds of *Sophora Japonica*, *Pharm. Journ.*, Aug., 1854, p. 64.

[2] *Enchiridion Botanicum*, p. 677.

[3] Ainslie, *Mat. Indica.*, vol. ii., p. 141

1860-62.

肥皂荳 *Fe-tsaou-tow ; Dialium* sp.? (*Leguminosæ*).

These are smooth, black seeds (Fig. 5), ¾ of an inch in diameter, of a compressed spherical form, each furnished (when perfect) with a large, rigid, persistent podosperm. A transverse section shows a pair of plane cotyledons, between the flat sides of which and the thick and hard testa, lies a layer of black, horny albumen.

Of the origin and application of this drug I have no information.

Hovenia dulcis.

枳椇子 *Che-keu-tsze ;* Fruits of *Hovenia dulcis,* Thunb. (*Rhamneæ*), *Sicku ;* Kæmpfer, *Amœn.* 808, 9; *Pun-tsaou,* Fig. 684.

The curiously-contorted, fleshy, fruit-bearing peduncle is edible, and said to have the flavour of pears. It is used in China and Japan to diminish the effects of an excess of wine.

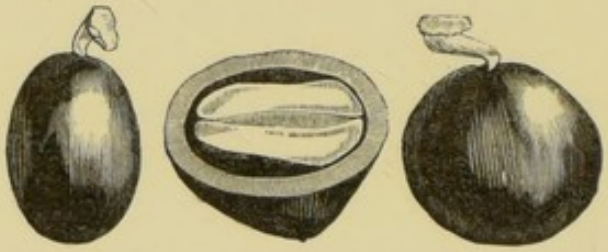


Fig. 5.—(The figure in the centre shows the transverse section of a seed slightly magnified.)

海金砂 *Hae-kin-sha;* Spores of a Fern (*Filices*); *Pun-tsaou,* Fig. 325 ; Cleyer. *Med. Simp.* No. 173.

A light, mobile, rufous-brown powder, which, when thrown into the air and ignited, burns like lycopodium, for which substance it might be substituted.

Citrus fusca.

枳殼 *Che-kŭh ;* Dried Fruits of *Citrus fusca,* Lour. (*Aurantiaceæ*), *Flor. Cochinch.* ed. Willd. 571.

My specimen of this drug consists of the fruit cut into halves and dried ; in this state it forms circular discs of from one to two inches in diameter, nearly flat on the cut side, convex on the exterior. The peel is firm and excessively thick, being about half the diameter of the dried pulp : externally it is rough and of a deep blackish-brown, internally of pale buff. It is bitter and agreeably aromatic.

1860-62. Chinese Fruits.

Loureiro states that *Citrus fusca* is widely diffused in Cochin China, but less common in China. He adds that the entire peel of the fruit is considered attenuant, deobstruent, and mildly cathartic.

The zest of a thick-skinned orange or citron dried in very thin slices, is found in the Chinese drug shops under the name of 橘白 *Keŭh-pih*.[1]

青皮 *Tsing-pe;* Immature Fruits of *Citrus*——? (*Aurantiaceæ*); *Cin-pi*, Tatarinov, *Catal. Med. Sinens.*, p. 12.

In Tatarinov's Catalogue, these fruits are referred to *Citrus microcarpa*, Bge., a plant which Professor Bunge describes as "*frutex in caldariis Pekinensibus frequens, fructu maturo mense Januario et Februario onustus.*"[2] I do not know what further range this plant may have, but if it is only cultivated on a small scale with artificial heat, it can hardly be the source of a common drug like that under notice: I think it best therefore to leave the species of *Citrus* undefined.

Tsing-pe.

The fruits called *Tsing-pe* are from $\frac{4}{8}$ to $\frac{5}{8}$ of an inch in diameter, and resemble the *Baccæ Aurantii* of European pharmacy, except that the latter have a somewhat less rough exterior.

馬兜鈴 *Ma-tow-ling;* Fruits of *Aristolochia Kæmpferi*, Willd., *Sp. Plant.* VI., pars i., p. 152 (*Aristolochieæ*); Hoffmann et Schultes, *Journ. Asiatique*, Oct., Nov., 1852, p. 275; *Kæmpf. Icones*, tab. 49; *Pun-tsaou*, Fig. 388.

Oval fruits of 1 to $1\frac{3}{4}$ inch in length, formed of six thin and papery valves, inclosing large, flat, obtusely-triangular, winged seeds. Each fruit is supported on a pedicel at least as long as itself.

In Tatarinov's Catalogue the name *Ma-tow-ling* is referred to *A. contorta*, Bunge, an identification I have not been able to confirm, though I have had the kind assistance of Professor

[1] T. T. Cooper observed immense quantities of *orange peel* being dried at Main-yang, a town about 50 miles west of Hankow. *Travels of a Pioneer of Commerce*, 1871, p. 38.

[2] *Mémoires présentés à l'Académie Impériale des Sciences de St. Petersbourg*, tome 2 (1835), p. 84.

1860-62. Chinese Seeds and Nuts.

Bunge. *A. contorta* is found in the neighbourhood of Pekin, and occurs also in the Amoor country.

菟絲子 *Too-sze-tsze;* Seeds of *Cuscuta Europæa,* L. (*C. major,* Bauh.) (*Convolvulaceæ*); *Pun-tsaou,* Fig. 379; *Tú sū çù,* Cleyer, *Med. Simp.* No. 9; *Tu-sy-tsy,* Tatarinov, *Catal. Med. Sinens.,* p. 61.

Roundish seeds of a light brown colour, about the size of black mustard. The long filiform embryo, spirally rolled round the fleshy albumen, which is characteristic of the genus *Cuscuta,* may be readily seen if a seed be soaked in water and its testa then removed.

Cuscuta.

For the species of *Cuscuta* to which these seeds are referred, I adopt the authority of MM. Hoffmann and Schultes;[1] but although *C. Europæa* is found in Japan, and probably occurs in China also, there is another species, *C. Chinensis,* Lam., the seeds of which I find to be extremely similar, so that it is very likely they may pass under the same native name. I am not aware what virtues are ascribed by the Chinese to this drug. The entire plant (*Herba Cuscutæ majoris*) was formerly official in Europe as a purgative.

Nelumbium Speciosum.

蓮子 *Lien-tsze;* Nuts of *Nelumbium speciosum,* Willd. (*Nelumbiaceæ*); *Pun-tsaou,* Fig. 703.

These nuts, which in shape and size resemble small acorns, are produced by the well-known Nelumbrium or Egyptian Bean, called in China *Water Lily,* a plant extensively cultivated both in that country and in India, as well for its ornamental flowers as for its various useful properties. The nuts have a farinaceous kernel, which, when boiled or roasted, is good to eat. The thick fleshy rhizome is likewise edible when cooked; the starch which it contains, separated by rasping and washing, constitutes a sort of arrowroot, called by the Chinese 藕粉 *Gaou-fun.*

Water Lily.

菱 *Ling;* Fruits of *Trapa bicornis,* L. (*Halorageæ*); *Pun-tsaou,* Fig. 704.

[1] *Journal Asiatique,* Oct., Nov., 1852, p. 288.

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The plant is abundant on canals and shallow lakes, from the surface of which its singular fruits (Fig. 6) are collected in

Trapa bicornis.

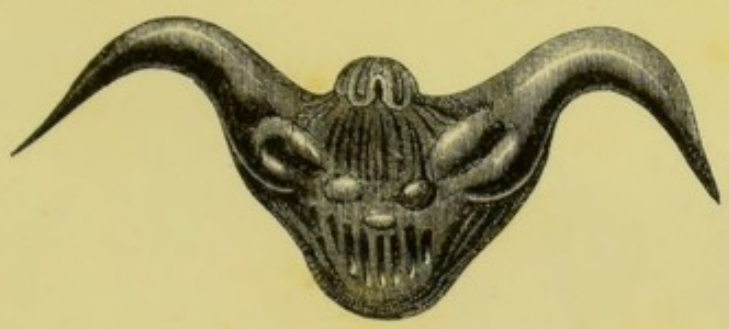


Fig. 6.

immense quantities, on account of their kernels, which, when roasted, are edible.

梔子 *Che-tsze;* 山梔 *Shan-che;* Dried Fruits of two or more species of *Gardenia* (*Rubiaceæ*); Che-tsze, *Pun-tsaou*, Fig. 783; Czzi-tsy (Che-tsze), *Fructus Gardeniæ floridæ*, Tatarinov, *Cat. Med. Sinens.*, p. 17.

Under the above Chinese names (otherwise spelt *Tchi-tse* and *Chan-tchi*) I have received the dried fruit of two species of *Gardenia.*

Gardenia.

The larger (Fig. 7), called *Che-tsze*, occurs as a smooth, oblong, orange-brown, imperfectly two-celled berry, of from $1\frac{1}{4}$ to 2 inches in length, crowned with the remains of the calyx, which are prolonged down the sides of the fruit in six prominent ribs. The pericarp is fragile and horny, marked internally by two narrow projecting receptacles. The seeds are numerous and imbedded in a dark orange pulp.



Fig. 7.

Dr. T. W. C. Martius has presented me with specimens of this fruit under the name of "*Wongshy*" (*Whang-che* 黃梔), and refers it to *Gardenia radicans*, Thunb.

Gardenia radicans.

The smaller fruit (Fig. 8), called *Shan-che*, is from $\frac{8}{10}$ to $\frac{1}{2}$ an inch in length, of an ovoid form, smooth, six-ribbed, furnished

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The precise species of *Gardenia* affording each of these fruits is not yet clearly made out. There appear to be at least three plants whose fruits are used on account of their colouring properties. These are:



Fig. 8.

Gardenia florida. 1. *Gardenia florida*, L., a large, very ramous shrub, native of Japan, China, India, &c. Major Champion found it in abundance in several localities in Hong Kong.[1] Mr. Fortune has informed me that it is common in the hilly districts at some distance from Shanghai, and that its fruit is collected for dyeing purposes, but not produced so abundantly as that of *G. radicans*.

Gardenia radicans. 2. *Gardenia radicans*, Thunb., a much smaller plant than *G. florida*, with a decumbent rooting stem. It is a native of Japan, China, India, &c. Mr. Fortune has given me its Chinese name as *Whang-tsze*, and stated that its fruit is commonly collected in the north of China for its colouring properties.

Gardenia grandiflora. 3. *Gardenia grandiflora*, Lour., a native of Cochin-China. Loureiro mentions that its fruits impart a beautiful colour to silk, and that they are also used medicinally in decoction, in fevers, and in a variety of other complaints.[2]

The fruits of these Chinese Gardenias (which are so similar in properties that the analysis of one will probably serve for the other two) have been examined by several chemists, among whom, as the most recent, may be mentioned Mr. Lorenz Mayer, of the laboratory of Professor Rochleder, of Prague. According to the investigations of this gentleman,[3] the splendid yellow colour of the *Gardenia* is due to a body named *crocine*, which appears to be identical with the polychroite of saffron. Crocine is uncrystallizable; when in powder it is of a bright red colour;

[1] *Hooker's Journ. of Bot.*, vol. iv. (1852), p. 193.

[2] *Flor. Cochinch.*, p. 183.

[3] On the Yellow Colouring Matter of the Fruit of *Gardenia grandiflora*, by F. Rochleder. *Chemical Gazette*, Sept. 1, 1858, p. 331. *Pharm. Journ. and Trans.*, vol. xviii. (1859), p. 626.

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it dissolves readily in water or alcohol, its solution possessing the colour of chromic acid. Salts of lead give orange-red precipitates with a solution of crocine; if a concentrated aqueous solution be treated with sulphuric acid, the mixture assumes an indigo-blue colour, which changes to violet. By the decomposition of crocine, a body called *crocetine* is obtained. The composition of crocine is, (2 C_{58} H_{42} O_{30}) + HO; that of crocetine C_{42} H_{23} O_{11}.

Crocine and Crocetine.

橄欖 *Kan-lan;* Fruits of two or more species of *Canarium* (*Burseraceæ*) *Pun-tsaou*, Fig. 668; Chinese Olive.

Chinese Olive.

Most persons who have lived in China are acquainted with a small edible fruit, which from its oblong shape and being generally sold preserved with salt, has acquired the name of *Chinese Olive.* The stones of this fruit are also well known from being frequently carved into beads and other ornaments. The Chinese olive, I need hardly observe, has not the least affinity with the true olive (*Olea Europæa*, L.), but belongs to the natural order *Burseraceæ* and genus *Canarium.* The precise species, for there are probably two or three, are not well made out. Loureiro describes in his genus *Pimela*, now referred to *Canarium*, two plants yielding edible fruits, namely, *P. nigra* (*Canarium Pimela*, Konig and Sims, *Annals of Botany*, vol. i., 1805, p. 361, tab. 7, Fig. 1) and *P. alba* (*Canarium album*, Raeuschel, *Nomenclator Botanicus*, ed. 3, 1797, p. 287).[1]

Pimela nigra et P. alba.

Dried specimens of the fruits of these plants were presented to me by the late Mr. Reeves. That of *Pimela nigra* is an oval drupe 1½ inch long, covered with a smooth black skin. The pulp, which is rather firm, surrounds a large, obscurely triangular pointed stone. The fruit of *Pimela alba* resembles that of *P. nigra*, except that it is of a pale brown and has its outer skin much corrugated by drying.

Besides these, and probably distinct from them, there are, according to my friend Mr. Lockhart, two other fruits used by the Chinese and commonly sold at certain seasons, the one at

[1] Information on this subject is given in a paper by Hance, on the so-called *Olives* of Southern China, *Pharm. Journ.*, Feb. 25, 1871, p. 684.

1860 62. Shanghai, the other at Foo-chow. As I have not seen either of these fruits, I can offer no opinion upon them; but to those resident in the districts in question, I would address the request for specimens, including the pressed and dried flowers and leaves of the plants, in order that their botanical names may be determined. It is also desirable to ascertain in each case, how the fruit is used by the Chinese, by what names it is known, and if the tree is cultivated or grows spontaneously.

Melia. 川練子 *Chuen-lëen-tsze;* Fruits of *Melia* sp. (*Meliaceæ*); *Czuan-lan-tsy,* Tatarinov, *Catal. Med. Sinens.,* p. 15; *Pun-tsaou,* Fig. 745.

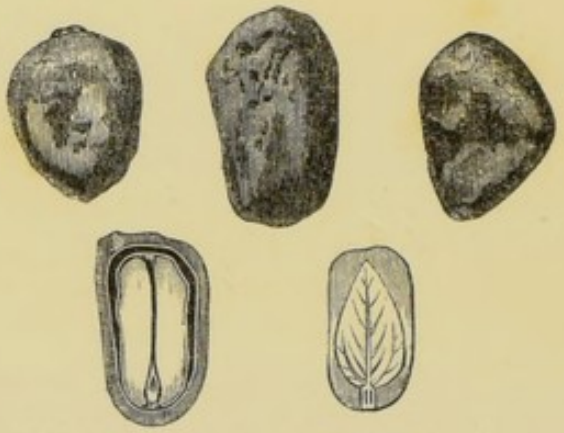


Fig. 9.—Three seeds, natural size; longitudinal section of a seed; half-seed (testa removed) showing leafy cotyledon.

A fleshy, globular drupe about an inch in diameter, covered with a shining, thin, horny, yellowish-brown skin, within which, surrounded by dried pulpy matter, is a large stony endocarp furrowed longitudinally and containing seven or eight cells of which, however, not more than six are usually developed. Loureiro gives *Xún-lién* (Chuen-lëen) as the Chinese name of *Melia Azedarach,* L., but the fruits of that tree are five-celled and much smaller than those in question. The drug under notice is used in China as a vermifuge.

大楓子 *Ta-fung-tsze;* Seeds of *Chaulmoogra* sp. (*Pangieæ*); *Pun-tsaou,* Fig. 775; *Da-fyn-tsy,* Tatarinov, *Cat. Med. Sinens.,* p. 19.

These seeds (Fig. 9), which are imported into China from

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Siam, are from $\frac{4}{8}$ths to $\frac{7}{8}$ths of an inch long, of an oblong or ovoid shape, very irregular, owing to mutual pressure in the fruit of which they formed a part. They consist of a hard woody outer shell (testa), to whose surface, portions of firm, dry pulp, or of the rind of the fruit, are often adherent,—sometimes so as to unite two or three seeds into a mass. The albumen is oily and incloses large, heart-shaped, leafy cotyledons.

Chaulmoogra, reputed remedy for leprosy.

The plant affording these seeds is not well ascertained. It is doubtless a species of *Chaulmoogra :* probably, judging from the resemblance of the seeds, nearly allied to the Indian *C. odorata*, Roxb. The seeds of the latter plant are larger, and have a thinner and smoother testa than is the case with those found in the Chinese shops. Both seeds have a reputation as a remedy in skin complaints, especially in that most frightful of eastern diseases, leprosy. Dr. Hobson, late of the Canton Hospital, whose experiments appear to have been made with the seeds of the Indian *Chaulmoogra*, reports respecting them,[1] that he has found them to effect a cure in mild cases of leprosy, not of long standing; that the remedy (consisting of the powdered, oily nucleus of the seed) was administered in one drachm doses twice a day during a period of four months or more, and that the expressed oil of the seeds was occasionally rubbed on the affected surfaces. The first appearance of improvement observed was in the eruption becoming less prominent, and red, minute white scales appearing round the circumference of the patches, and the central parts assuming the character of healthy skin. Saline aperients are to be administered occasionally during the course of treatment.

Forsythia suspensa.

連翹 *Lëen-keaou;* Fruits of *Forsythia suspensa*, Vahl. (*Oleaceæ*); Siebold et Zuccarini, *Flora Japonica*, p. 10, t. 3.

As found in Chinese commerce, these are little boat-shaped, brown capsules, $\frac{1}{2}$ to $\frac{3}{4}$ of an inch long, with a thin longitudinal partition. They constitute the valves of the fruit, which, in its perfect state, is thus described by Endlicher:—"Capsula ovata, compressiuscula, sublignosa, corticata, bilocularis, loculicido-

[1] "On the Leprosy of the Chinese." *Med. Times and Gazette*, June 2, 1860, p. 558.

1860-62. bivalvis, valvis planiusculis, medio septiferis. Semina in loculis pauca, pendula, compressa; testa membranacea hinc in alam angustam, inde in marginem angustissimam expansa. Embryo in axi albuminis carnosi, parci rectus; cotyledonibus foliaceis, radicula brevi, cylindrica, supera.[1]

Sterculia platanifolia. 梧桐子 *Woo-tung-tsze;* Seeds of *Sterculia platanifolia,* Lin. fil. (*Sterculiaceæ*).[2]

Spherical, about the size of peas, externally covered with a shrivelled, shining, pale-brown skin.

Daphnidium. Cubeba. 畢登茄 *Pĕih-ching-kea;* Berries of *Daphnidium Cubeba,* N. ab E. (*Laurineæ*); *Laurus Cubeba,* Lour.; *Cây Mang tang* (Cochinchinese).

The Chinese name *Pĕih-ching-kea,* under which I have received these berries, appears to be also applied to cubebs; and in fact, if one may judge from the wood-cut in the *Pun-tsaou* (Fig. 690), it is to the latter drug that it properly belongs. Whether the Chinese confound the two and use them indiscriminately, or whether they consider one as a mere variety of the other, I am unable to say. The friend who obtained one specimen in my possession, presented it to me marked "*Cubebs,*" and I believe he is not the only person who has fallen into such an error. M. Rondot, in his *Commerce d'Exportation de la Chine* (Paris, 1848), enumerates cubebs as a production not only of Java, but of China likewise; he also mentions that the Chinese cubebs are exported exclusively to India, whence we may conclude that they are not suitable for European markets. Are not these Chinese cubebs the drug under notice?

The drug which I have received consists of small berries, which, in size, form, and general appearance, much resemble peppercorns or cubebs; examined attentively, however, they are seen to be one-seeded globular berries (Fig. 10) attached to a pedicel sometimes half an inch long; at the base of each berry traces of the perianth are visible. The pericarp is thin, fleshy, and in the dried state, corrugated. The seed is globular,

[1] *Gen. Plant.*, p. 573.
[2] Well figured in Baillon's *Hist. des Plantes, Malvacées,* 1872, p. 60.

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with its cartilaginous, shining brown testa surrounded, longitudinally by a narrow ridge. The cotyledons are hemispherical, thick, and oily; the radicle superior.

Botanical origin of *Daphnidium Cubeba.*

In endeavouring to assign a botanical origin to this drug I have been guided chiefly by two considerations:—1, The evident laurineous structure of the berries. 2, Their superficial resemblance to cubebs. Turning to Loureiro's *Flora Cochinchinensis*, we find, under the name *Laurus Cubeba*, a tree described, the fruit of which so remarkably coincides with the drug under notice, that I cannot but conclude the two are identical. This tree was transferred by Nees ab Esenbeck, in his *Systema Laurinarum*, to the genus *Daphnidium*, but he borrowed the description of it from Loureiro, and had evidently examined

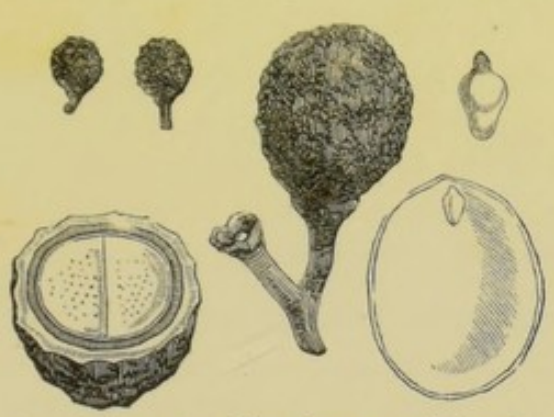


Fig. 10.—Two berries, natural size; berry magnified, and transverse section of ditto; cotyledon with radicle (magnified).

no specimen—in fact, it is apparently unknown to recent botanists. Loureiro describes its fruit as "Bacca globosa, nigra, pedunculata, minima: semine globoso." He adds that the berries are strengthening, cephalic, stomachic, and carminative, and that in decoction they are useful in vertigo, hysterical affections, paralysis, melancholy, and impaired memory—properties which are possessed by the bark, though to a less degree. The fresh fruits are used for the preserving of fish. The odour of the berries is fragrant, their taste is aromatic and somewhat pungent, and occasions a flow of saliva. They have the size, form, and colour of black pepper. Each berry is attached to a slender, rather long pedicel, whence they might be called not inappropriately *Piper caudatum*.

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Daphnidium Cubeba is cultivated in Cochin-China, and probably in Southern China also. Loureiro omits to give its Chinese name.

Legumes of *Prosopis*

牙皂 *Ya-tsaou;* Legumes of *Prosopis?* (*Leguminosæ*); *Yà Caò*, Cleyer, *Med. Simp.*, No. 223.

These are the pods of some leguminous tree at present undetermined, but which, judging from analogy, is probably not far distant from the genus *Prosopis*. They are from two to four inches long, and from $\frac{3}{10}$ to $\frac{5}{10}$ of an inch broad, more or less sickle-shaped and compressed, their upper edge prolonged into a narrow wing. The anterior extremity is pointed, the posterior attenuated into a sort of stalk. The pods are indehiscent, and have thick pulpy valves, which are externally smooth and of a deep brown. The substance of the pod, when chewed, even in very small quantity, produces an extremely disagreeable sense of acridity in the fauces. Its properties are thus quaintly described by Cleyer: "Intrat hepar et stomachum. Catarrhos solvit. Aperitivum est meatuum. Tumores complanat." The drug is said to be produced in the province of Szcehuen."

Large round China Cardamom.

草蔻 *Tsaou-kow;* Large Round China Cardamom, *Pharm. Journ.*, xiv., 353, Fig. 1, 2.

Although this species of cardamom, as well as those that follow, have already been described and figured in the *Pharmaceutical Journal*,[1] it will probably add to the value of this paper if I briefly recapitulate the characters by which they are distinguished, and the chief points of interest attaching to them.

The *Large Round China Cardamom* varies considerably in size, my specimens being from $1\frac{2}{10}$ inch to $\frac{1}{10}$ of an inch in length. The capsules are somewhat oval or globular, pointed at either extremity, obscurely three-sided (except at the base, where the triangular character is strongly marked); they are sometimes attached to a long pedicel. The pericarp closely invests the mass of seeds; it is brown and strongly marked by interrupted longitudinal ridges; it is hardly aromatic. The seeds are

[1] "On some Rare Kinds of Cardamom." *Pharm. Journ.*, xiv., 352; also, *Journ. de Pharmacie et de Chimie*, Mai et Juin, 1855; *Bonplandia*, 1 Juni, 1855.

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coherent into a three-lobed mass; they are generally light greyish-brown, somewhat oblong and angular, with a deep furrow on one side; they have a slight aromatic odour and taste, the latter suggestive of thyme, though much weaker. This cardamom, as generally met with in the Chinese shops, has been deprived of its husks. It is a native of the South of China and of Cochin-China, whence it is exported. It appears to be much employed in Chinese medicine as a stomachic, but it must be very inferior in power to some other species.

Small round China Cardamom.

Small Round China Cardamom.—Cardamome ronde de la Chine.—Guibourt, *Hist. des Drog.*, éd. 4, tome ii. (1849), p. 215, Fig. 113, 114 (excluding other synonyms); *Pharm. Journ.*, xiv., 354, Fig. 3.

A smaller fruit than the preceding, which it much resembles. The following description of it is taken from M. Guibourt's *Histoire des Drogues*:—

"Capsules pedicelled, nearly spherical, from seven to eight lines in diameter, slightly striated longitudinally and much wrinkled in all directions by drying; it is probable, however, that the fruit was smooth when recent. The capsule is thin, light, easily torn, yellowish externally, white within. The seeds form a globular coherent mass. They are rather large and few in number, somewhat wedge-shaped, of an ashy-grey, a little granular on the surface and present on the outer face a bifurcate furrow, shaped like a **Y**. They possess a strongly aromatic odour and taste."

To this description I may add that, compared with the *Large Round China Cardamom*, the capsules in question are more wrinkled in a network manner, more fragile and thin, and (from immaturity?) much less adherent to the mass of seeds; they even are more globose, not triangular at the base, but flat, or even depressed like an apple. Their colour, in all the specimens I have seen, is a brownish-yellow. I cannot confirm M. Guibourt's remark as to the highly aromatic properties of the seeds.

This cardamom, which appears to bear the same Chinese name as the foregoing, is attributed by M. Guibourt to the *Amomum globosum* of Loureiro.

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Ovoid China Cardamom.

草菓 *Tsaou-kwo;* Ovoid China Cardamom. Fruit of *Amomum medium*, Loureiro, *Flor. Coch.*, ed. Willd. (1793), p. 5 (*Scitamineæ*); *Cao-go*, Tatarinov, *Catal. Med. Sinens.*, p. 5; *Pharm, Journ.* xiv., 419, Fig. 9.

The *Ovoid China Cardamom* is a product of Southern China, and abundant in the drug shops of Singapore, as well as in those of China. It is an oval or oblong, three-celled, three-valved and obscurely three-sided fruit, of from 1 to $1\frac{3}{4}$ inch in length. The pericarp is of a dusky greyish-brown, deeply striated longitudinally, thick and coriaceous, frequently covered on the surface with a whitish efflorescence; it is but slightly aromatic. The seeds are very large, often upwards of three lines in length, sharply angular, hard and striated, having a powerful and peculiar aromatic smell and taste.

The seeds of the *Ovoid China Cardamom* are used by the Chinese for a variety of disorders, and, according to Loureiro, are also employed as a condiment.

Amomum medium is a plant known at present only through an unsatisfactory description by Loureiro in his *Flora Cochinchinensis.*

砂仁殼 *Sha-jin-kŏ;* Capsules (deprived of seeds) of *Amomum xanthioides* Wallich (*Scitamineæ*); husks of the *Xanthioid Cardamom. Pharm. Journ.*, xiv., 418, Fig. 7.

Xanthioid Cardamom.

These empty capsules are mostly attached to a common stalk, which, when perfect, is about five inches long and beset with the remains of sheathing bracts. The superior portion, which is much stouter than the rest, bears the fruits closely crowded together on short, bracted pedicels. No bunch in my possession bears more than twelve fruits, but from the number of pedicels on some specimens it would appear that the flowers at least are often twice as numerous. The capsules having been deprived of seeds are shrunken and compressed, but after soaking in boiling water they acquire their proper volume, becoming nearly spherical and about three-quarters of an inch in diameter. The pericarp is covered with long, acute, recurved spines, which are longest near the base.

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Amomum Xanthioides.

Amomum xanthioides is a native of Burmah, where it was discovered by Wallich in 1827. It also occurs in the Laos country and Cambodia, where its fruits are collected for use. The plant being but little known, it was with much pleasure that I learned from Sir R. H. Schomburgk, by a note under date March 28, 1861, that he had just succeeded, after many endeavours, in procuring living specimens, which he had in cultivation at Bangkok, and from which he hoped to obtain flowers and fruits. The seeds of *A. xanthioides* deprived of their pericarp, are sometimes sold in the London market as *Malabar Cardamoms*, for which they are not a bad substitute. To what uses the Chinese apply the husks, which are devoid of aroma, I am unable to say.

Hairy China Cardamom.

陽春砂 *Yang-chun-sha ;* Hairy China Cardamom. *Pharm. Journ.*, xiv., 354, Fig. 4, 5.

A small scitamineous fruit supposed to be that of Loureiro's *Amomum villosum*, a Cochinchinese plant, of which very little is known. It is sometimes sold attached to the stalk, sometimes removed from it. The scape, which, when perfect, is about three inches long and reclinate, bears as many as eight or ten capsules upon its superior extremity. The capsules are from six to ten lines in length. In the dried state they are oval, occasionally nearly spherical, more or less three-sided, bluntly pointed, with a scar at the summit, rounded at the base, and attached by a pedicel one to two lines long. The pericarp is externally dark brown, marked with obscure longitudinal *striæ* and covered with asperities, which, after soaking in water, are seen to be short, thick, fleshy, closely-crowded spines. It has, when bruised, an aromatic and tar-like odour ; the seeds have a similar tar-like odour and taste, not unmixed with the aromatic warmth of the Malabar cardamom ; they are angular, and upon removal of the pericarp, remain united in a three-lobed mass. The scape is densely villous ; the pericarp of the immature fruit is slightly so, but in the mature fruits this character is not observable.

A plant producing this cardamom grows on the mountains of Pursat in Cambodia.[1]

[1] Thorel, *Notes Médicales du Voyage d'Exploration du Mékong et de Cochinchine*, Paris, 1870, p. 30.

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This cardamom is said to grow in the province of Kwang-tung, and in the Yang-yun district of Southern China. It appears to be frequently used in medicine by the Chinese, and is, no doubt, a good representative of the Elettaria cardamom official in Europe.

Bitter-seeded Cardamom.

益智子 *Yih-che-tsze;* Bitter-seeded Cardamom. *Pharm. Journ.*, xiv., p. 418, Fig. 8; *Pun-tsaou*, Fig. 173.[1]

The capsules are mostly oval, some ovate-oblong, and a few nearly spherical, pointed at the extremities, six to ten lines long. The pericarp is of a deep dusky brown, coriaceous, devoid of hairs, beset longitudinally with interrupted ridges usually about eighteen in number; it has an agreeable aromatic smell and taste. The seeds are obtusely angular and adhere firmly together; they are distinguished by an aromatic, *bitter, myrrh-like* taste.

It is not known what plant produces this little fruit. The MS. catalogue of the collection of Chinese drugs at the Royal College of Physicians of London, mentions the province of Kwang-tung as its place of growth, and it is also said to grow in the island of Hainan.

Galanga Cardamom.

高良薑子 *Kaou-leang-keang-tsze;* 紅豆蔻 *Hung-tow-kow;* Fruits of *Alpinia Galanga*, Willd. (*Scitamineæ*); Galanga Cardamom, *Pharm. Journ.*, xiv., Fig. 10, 11.

Capsules about half an inch in length, of an oblong form, somewhat constricted in the middle, or occasionally pear-shaped; some are obscurely three-sided. Each fruit is prominently crowned with the remains of the calyx; in a few, the lower extremity is still attached to a slender pedicel. Most of the capsules are much shrivelled on the outside, apparently from having been gathered while immature; a few, however, retain a plump and smooth appearance. The pericarp varies externally in colour according to its maturity, from a pale to a deep reddish-brown; internally it is whitish. It is glabrous; in the mature

[1] Received from R. Swinhoe a specimen of this drug, which he says is from Hainan, where the aborigines use it as *tea*. He adds that there is "good reason" to believe it to be the fruit of the alpinia which affords the *Galangal Root* of commerce, 15, vij., 70

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fruits thin and brittle, not splitting into valves; in the shrivelled fruits it appears stronger, from its close adherence to the mass of seeds. Upon removal of the pericarp the seeds are seen united in a three-lobed mass, completely invested in a whitish integument, each cell or lobe containing, usually, two seeds, placed one above the other. The seeds are ash-coloured, flattish, and somewhat three-cornered; finely striated externally towards a large conspicuous *hilum* which faces the wall of the capsule, and which is connected with the axillary placenta by a long, broad *funiculus*. Each seed is nearly surrounded by a tough aril; opposite the *hilum* a scar-like depression is observable. The seeds have a pungent, burning taste, and aroma resembling the *Larger Galangal Root*; the pericarp is similarly aromatic and biting.

Alpinia Galanga.

Authentic specimens of the fruit of *Alpinia Galanga* grown in the Calcutta Botanic Garden, and kindly placed at my disposal by Dr. Thomson, are identical with the Chinese drug.

Round or Cluster Cardamom.

東坡荳蔻 *Tung-po-tow-kow;* Round or Cluster Cardamom. Fruit of *Amomum Cardamomum*, L. (*Scitamineæ*); also called in Chinese *Hang-kow, Seaou-kow*, &c.

A well-known fruit, described in all the larger works on Materia Medica, but which in recent times had become rare, its place being supplied by the Malabar cardamom (*Elettaria Cardamomum*, Maton), the seeds of which are very similar in odour and taste. Since, however, the opening of Siam to European commerce, round cardamoms have been frequently imported into London from Bangkok.

Note about *Tsing-mŭh-heang.*—From the *Trade Report for Ningpo* for 1868 by Acting Commissioner Bowra, published in the *Reports on Trade at the Treaty Ports in China* for 1868. Shanghai Customs' Press, p. 51. Of the medicines exported from Ningpo fully one-third is a root known locally as *Pa-chŭh*[1] (白术) or to the annual value of about 79,853 taels. (= £ 26,617). It is

[1] Hance, who has examined the living plant, makes of it a new species which he calls *Aristolochia recurvilabra*. *Vide* Trimen's *Journ. of Bot.* March, 1873, p. 72; *Pharm. Journ.*, March 15, 1873, p. 725.

1860-62. cultivated in the *Shao-shing* prefecture, and highly esteemed as a remedy in rheumatism. It is worth $10 to $15 per picul, and is mainly sent to Hô-nan and Sz-chinan. It is not the *put-chuk* of India, though said to be sometimes palmed off as such. The plant, which resembles the English birthwort, is a common garden creeper in Ningpo.

Green Put-chuk. It is exported from Ningpo as Green putchuk.

ROOTS.

Chinese Roots. *Yŭh-kin.* 鬱金 *Yŭh-kin.*—Tubers of a species of *Curcuma* (*Scitamineæ*); *Pun-tsaou*, Fig. 179; Tatarinov, *Catal. Med. Sinens.*, p. 32; *Yŏ-kin*, Cleyer, *Med. Simp.*, No. 65.

Oblong or ovate tubers (Fig. 11) tapering at either end, from ¾ to 1¼ inch in length, covered externally with a thin, adherent, brownish-grey cuticle, usually (but not invariably) smooth. When broken, they exhibit a shining fracture, and are seen to consist of a hard semi-transparent, horny, orange-yellow substance, easily separable into two portions, an inner and an outer. The tubers have an aromatic odour, and a slight taste resembling turmeric, and contain an abundance of starch.



Fig. 11.

Many scitamineous plants produce at the extremities of the roots springing from the rhizome, starchy tubers such as those above described. Dr. Roxburgh calls them *pendulous tubers*, from their descending into the ground beneath the rhizome.[1] They are usually less aromatic, and more amylaceous, than the rhizome: from those of some species of *Curcuma*, the so-called East Indian arrowroot is manufactured.

The plant producing *Yŭh-kin* is undetermined; it is a native of the south of China, and is most probably a species of *Curcuma*.

[1] See figures given by Rumphius, Kæmpfer, Roscoe, and others.

1860-62.

玉竹 *Yŭh-chŭh;* Rhizome of *Bambusa Arundo,* Nees (*Gramineæ*); *Yĕ chŏ, Arundo Bambos,* Lour. (non Linn.) *Yŭh-chŭh.*

This drug consists of a rhizome of a pale yellowish-brown colour and somewhat translucent, in contorted pieces of some inches in length, flattened or nearly cylindrical, $\frac{2}{10}$ to $\frac{4}{10}$ of an inch in greatest diameter, marked with concentric rings at unequal distances, and dotted with the remains of radical fibres. The pieces are moist, compressible and flexible, but break readily with a short fracture. They have a sweetish, mucilaginous taste, with but little odour. When macerated in water, they regain their natural dimensions, becoming three times as thick as in the dry state. The root and young shoots of this bamboo are stated by Loureiro, in the medical language of the day, to be resolvant and attenuant, to promote diaphoresis and diuresis, and to purify the blood.

蒼术 *Tsang-shŭh;* Rhizome of *Atractylodes* sp. (*Compositæ*); *Pun-tsaou,* Fig. 102. *Tsang-shŭh.*

Portions of a rhizome from $\frac{1}{2}$ to $\frac{3}{4}$ of an inch in diameter, occurring in oblong, jointed, occasionally branching pieces, of $1\frac{1}{2}$ to 3 inches in length. They are invested with a rough, brown cuticle, and some pieces are beset with radical fibres. The cut surface exhibits a spongy whitish substance, scattered through which, cells filled with resinous-looking matter of a deep orange colour may be seen with a lens.[1] *Tsang-shŭh* has a slightly aromatic odour, though but little taste. It is enumerated among the drugs of Kiang-nan and Hoo-kwang. According to MM. Hoffmann and Schultes,[2] three species of *Atractylodes,* namely, *A. lancea* D.C., *A. lyrata* S. et Z., and *A. ovata* D.C., are known by the Chinese name above given. Thunberg, who describes two of them under the genus *Atractylis,* does not allude to their possessing medicinal properties.

玄參 *Heuen-săng; Hiuen sen,* Cleyer, *Med. Simp.,* No. 44; *Pun-tsaou,* Fig. 110; *Siuan-szen,* Tatarinov, *Cat. Med. Sinens,* p. 48. *Heuen-săng.*

[1] This resinous-looking matter is not removed by water, alcohol, or ether.

[2] *Journal Asiatique,* Oct., Nov., 1852, p. 275.

1860-62. Fleshy roots of about four inches in length and one inch in diameter at the middle, whence they taper to either extremity. They are longitudinally wrinkled and furrowed, and covered with an adherent brown cuticle; internally they are fleshy and black; they have a sweetish taste and but little odour.

Corydalis ambigua.

延胡索 *Yen-hoo-sŭh;* Tubers of *Corydalis ambigua*, Chamisso et Schlechtendal in *Linnæa*, t. i. (1816), p. 558 (*Fumariæ*); *Pun-tsaou*, Fig. 133.

Little, hard, brown tubers, of somewhat flattened spherical form, averaging half an inch in diameter. Externally, they are covered with a thin wrinkled cuticle; when broken, they exhibit a bright yellow, semi-transparent, waxy appearance.

Corydalis ambigua Cham. et Schl., from which, according to Messrs. Hoffmann and Schultes,[1] this drug is derived, is a plant of Siberia and Kamtschatka, throwing up its flowers upon the melting of the snow in early spring; it is also found in the Amoor country. I am indebted to Dr. E. Regel, of St. Petersburg, for an authentic specimen of the tuber of this plant, comparison of which with the Chinese drug is confirmatory of their identity.

Convallaria Japonica.

麥門冬 *Mĭh-mun-tung;* Tubers of *Ophiopogon Japonicus*, Ker (*Smilaceæ*); *Convallaria Japonica*, L.; *Mondo*, Kæmpf., *Amœn.*, p. 823, with Fig.; *Pun-tsaou*, Fig. 268; *Mĕ mûen tum*, Cleyer, *Med. Simp.*, No. 14.

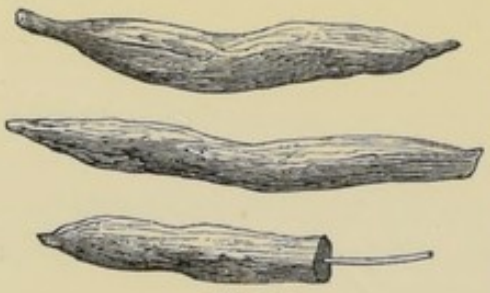


Fig. 12.

This drug consists of cylindrical fleshy tubers, from 1 to 2 inches in length, and from $\frac{1}{8}$ to $\frac{1}{4}$ of an inch in diameter, tapering at either extremity (Fig. 12). They are of a pale yellowish grey colour and translucent; somewhat shrivelled through drying, soft, flexible, yet easily broken. A central ligneous cord, resembling a stiff thread, runs longitudinally through each.

[1] *Op. cit.*, p. 286.

1860-62.

The tubers have a slightly saccharine and aromatic taste, with a somewhat terebinthinous not unpleasant odour. Their aqueous decoction is not rendered blue by iodine.

Ophiopogon Japonicus.

Ophiopogon Japonicus, a low-perennial with a creeping rhizome, produces small tubers as expansions of the radical fibres: that they are really identical with the drug found in the Chinese shops, I have been able to convince myself by actual comparison. Kæmpfer, who figures the plant well, states that a second species called in Japanese *Temondo*, and common in the province of Satzuma, produces larger tubers, and is therefore preferred. Two varieties of *Ophiopogon Japonicus* are described by Thunberg;[1] one of them may possibly be identical with Kæmpfer's *Temondo*. According to Loureiro, the tubers of his *Commelina medica* (*Aneilema*, R. Br.) are called *Mŭh-mun-tung*.

Temondo.

The drug under notice is in frequent use among the Chinese, the candied tubers being eaten as a medicine.

Melanthium Cochinchinense.

天門冬 *Tĕĕn-mun-tung;* Tubers of *Melanthium Cochinchinense*, Lour.; *Tian-myn-dun*, Tatarinov, *Catal. Med. Sinens.*, p. 56; *Pun-tsaou*, Fig. 401.

These, like the preceding, are fleshy, translucent, yellowish-brown tubers, of the thickness of a writing quill to that of the little finger, and often 3½ inches in length. They are usually flattened, and more or less contorted and longitudinally furrowed. They have a mucilaginous, slightly saccharine taste, but do not possess any marked odour.

Loureiro states that this drug is regarded as diaphoretic and expectorant, and that it is administered in phthisis and also (in the form of decoction ?) to allay feverish thirst and heat. It is also preserved with sugar as a sweetmeat. It appears to be produced in the province of Chekiang. According to Loureiro, the plant is frequent in dry hedges both in Cochin-China and China.

Aucklandia Costus.

木香 *Mŭh-heang;* Root of *Aucklandia Costus*, Falc. (*Compositæ*), *Linn. Trans.*, vol. xix., part i. (1842), p. 23; *Aplotaxis Lappa*, Decaisne, in Jacquemont's *Voyage dans l'Inde*, tome iv.

[1] *Flora Japonica*, p. 139.

1860-62

(1844), *Botanique*, p. 96, pl. 104; *Mu-sian*, Tatarinov, *Cat. Med Sinens.*, p. 40; *Mŏ-hiam̃*, Cleyer, *Med. Simp.*, No. 18; *Costus Root* or *Putchuk*.

Putchuk.

This root is collected in enormous quantities in the mountains of Cashmere, whence it is conveyed to Calcutta and Bombay, and there shipped for China.

The drug has a pungent, aromatic taste, with an odour resembling that of orris root. There is an excellent account of it, with a figure, in Professor Guibourt's *Histoire des Drogues*, tome iii. p. 25.

Chuen-woo.

川烏 *Chuen-woo;* Root of? *Aconitum* sp. (*Ranunculaceæ*). Conical or top-shaped tuberous roots (Fig. 13), about 1½ inch in length, covered with a blackish-brown cuticle; internally they are white and amylaceous. They taste slightly bitter, and leave a persistent sensation of numbness and tingling on the tongue with some acridity in the throat.



Fig. 13.

Ground to powder, and mixed with an equal quantity of the root *Tsaou-woo* (next described) and of the flowers *Naou-yang-hwa*, also in powder, a compound is obtained which is reputed to produce local anæsthesia. This powder, moistened, is to be applied to the surface of the part to be operated upon for two hours previous to the operation, by which means, it is alleged, insensibility to pain will be produced.

Tsaou-woo [Aconitum Japonicum].

草烏 *Tsaou-woo;* Root of *Aconitum Japonicum*, Thunb.; Tatarinov, *Catal Med. Sinens.*, p. 5. Blackish tuberous roots analogous to the last, but smaller in size and less regular in form (Fig. 14). They are from $\frac{6}{10}$ of an inch to upwards of one inch in length, and from $\frac{2}{10}$ to $\frac{4}{12}$ of an inch in diameter; oblong or ovoid, either tapering or rounded at their extremities, covered with a smooth or furrowed blackish cuticle; internally, they are white and inodorous. They are used with the preceding



Fig. 14.

for producing insensibility to the pain of a surgical operation. According to Dr. Christison,[1] they are also the basis of an extract used to poison the arrows employed for killing game.[2] Dr. C., who examined some of this extract, reported that it had evidently been prepared with care and skill, and that a minute portion of it, applied to the tongue or lips, occasioned an intense sensation of numbness and tingling. 1860-62.

This aconite root is said to be produced in the province of Chekiang; I refer it to *Aconitum Japonicum*, Thunb. upon the authority of MM. Hoffmann and Schultes,[3] but it is highly probable the Chinese name is not restricted to a single species.[4]

青木香 *Tsing-mŭh-heang;* Root of *Aristolochia* sp.? Tatarinov, *Catal. Med. Sinens.*, p. 12. *Tsing-mŭh-heang.*

A grey, brittle root, of the thickness of a goose quill, whitish and farinaceous internally. It has a slightly aromatic taste, with but little smell: referred to an *Aristolochia* in Tatarinov's Catalogue.

知母 *Che-moo;* Rhizome of *Anemarrhena asphodeloides*, Bunge (*Liliaceæ*); Tatarinov, *Catal. Med. Sinens.*, p. 16; *Pun-tsaou*, Fig. 97. *Che-moo.*

A rhizome, the size of the little finger (Fig. 15), occurring in pieces often four inches long; the upper side is flattened, or even somewhat channelled, beset with coarse, appressed, ascending, rufous, or yellowish hairs, which pass into scales at the once growing extremity, where also the remains of a stem rising at a right angle from the rhizome sometimes occur. The under side is convex, and covered with thick radical fibres, or more usually with their scars. The drug has but little taste and smell:

[1] On a New Poison from the Interior of China, *Edinb. Medical Journ.* April, 1859, p. 869.

[2] T. T. Cooper mentions that the Lu-tsu tribes in South-western China use arrows dipped with a poison of aconite.—*Travels of a Pioneer of Commerce*, 1871, p. 310.

[3] *Journ. Asiatique*, Oct., Nov., 1852, p 271.

[4] Maximowicz enumerates nine species of *Aconitum* as occurring in the region of the Amoor, four in the neighbourhood of Pekin, and three in Mongolia.—*Primitiæ Floræ Amurensis*, St. Petersburg, 1859.

1860-62. it is brought from the province of Shansi. The plant is enumerated by Maximowicz in the Flora of Pekin.[1]

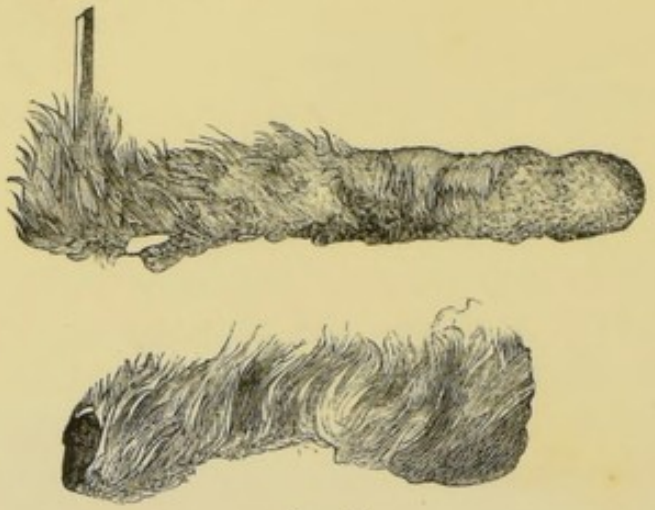


Fig. 15.

Yu-shŭh. 於术 *Yu-shŭh;* Root of a plant of the nat. ord. *Umbelliferæ(?)* Contorted fleshy roots, anteriorly about $\frac{3}{8}$ of an inch thick, but lower down swelled into nodular tubers, an inch or two in diameter, covered everywhere with a wrinkled brown skin; internally they are of a pale rusty colour, moist and easily cut, and have an aromatic odour and sweetish aromatic taste.

Chuen-keung. 川芎 *Chuen-keung; Czuan-siun, Rad. Levistici?* Tatarinov, *Catal. Med. Sinens.*, p. 15.

Nodular masses consisting apparently of the roodstock of some umbelliferous plant allied to Angelica. The specimens are from $1\frac{1}{4}$ to $2\frac{1}{2}$ inches in diameter, having a very irregular, rough, brown, outer surface, and a pale yellowish-brown, cavernous interior.

The odour of the drug resembles that of the root *Tang-kwei* (next described). A decoction of these two roots is taken daily by the Chinese women for some time previous to childbirth, under the idea that it diminishes the dangers incident to such a state.

Tang-kwei. 當歸 *Tang-kwei;* Root of *Aralia edulis*, S. et Z. (*Umbelliferæ*), *Flora Japonica*, tab. 25; *Doku quatz*, vulgo *Dosjen*, Kæmpf., *Amœn.*, p. 826; *Pun-tsaou*, fig. 155.

[1] *Primit. Flor. Amurens.*, p. 478.

This is a fleshy branching root, in size, shape, colour, and general appearance somewhat resembling gentian. It is internally whitish, has a sweetish, aromatic taste, and an odour approaching that of celery or angelica. It is said to be brought from the western provinces of China. 1860 62.

In Japan according to Von Siebold, *Aralia edulis* is universally cultivated in fields and gardens where it attains a height of three or four feet, flowering in August and ripening its bluish-black berries in November. It is valued chiefly on account of its root, which is eaten like Scorzonera, but the young stalks are likewise a delicious vegetable.[1] *Aralia edulis.*

人參 *Jin-sǎng;* Root of *Panax Ginseng*, C. A. Meyer (*Araliaceæ*) *fide* Horaninow; *Pun-tsaou*, Fig. 90; Ginseng Root. Ginseng Root.

The most esteemed variety of this famous drug is that obtained from Corea, but good qualities are produced also in Mongolia, Mantchouria, and other mountainous parts of the Chinese empire. The American ginseng imported into China is the root of *Panax quinquefolium*, L.; it is much less esteemed than the native drug. Ginseng is regarded by the Chinese as the most potent of restoratives, and the finer qualities realize extravagant prices.[2] Its medicinal value appears, however, to the European practitioner entirely overrated, the root being simply mucilaginous, aromatic, and slightly bitter and saccharine.[3]

升麻 *Shing-ma;* Rhizome of *Thalictrum rubellum*, S. et Z. (*Ranunculaceæ*); *Szen-ma*, Tatarinov, *Cat. Med. Sinens.*, p. 53; *Pun-tsaou*, Fig. 130; *Sien mâo*, Cleyer, *Med. Simp.*, No. 90. *Shing-ma.*

It is said to be produced in the province of Shan-si.

茅慈菇 *Mow-tsze-koo.* The pseudo-bulbs of an orchideous

[1] 2320 piculs imported annually into Ningpo, Bowra's *Trade Report*, 1869.

[2] See the interesting account of a ginseng merchant contained in Mr. Lockhart's *Medical Missionary in China*, ed. 2, p. 107.—Also consult *Notice sur le Ginseng* par. S. Raczynski in the *Bull. de la Soc. Imp. des Nat. de Moscou*, 1865, No. 1. pp. 70—76, avec une planche. There is an abstract in the *Bull. de la Soc. Bot. de France*, tome xiv. (1867) p. 56 (seems chiefly micro-chemical).

[3] *American, Corean and Japan Ginseng*, the quantity of each imported into Foochow in 1864, 5, 6, 7 and 8. See *Reports on Trade at the Treaty* ports of China for 1868, p. 63.

1860-62. plant; they are more or less ovate, shrunken, translucent, and horny; they vary in length from ½ an inch to 1¼ inch.

Kwang-koo. 光菇 *Kwang-koo;* Small bulbs resembling those of a tulip; they are about $\frac{6}{10}$ of an inch long, smooth, and of a buff colour. The thin enveloping outer membrane has been removed; when cut, the external scale is seen to be very thick.

Seaou-hwan-chai. 小環鈸 *Seaou-hwan-chai;* Rhizome in size and form resembling that of *Triticum repens* (*Radix graminis*), of a bright yellow colour, tasteless, and inodorous. It is said to be derived from an aquatic plant inhabiting Cochin-China. I have not been able to identify the Chinese name, nor do I know the uses of the drug.

Sang-pwan-hea. 生半夏 *Sang-pwan-hea;* Tubers (tuber buds) from the leaves of (?) *Pinellia tuberifera*, Tenore (*Aroideæ*); *Arisæma ternatum*, Schott, *Meletemata Botanica*, 1832. i., p. 17; *Pun-tsaou*, Fig. 357?

Under the name of *Sang-pwan-hea*, there occur in the Chinese shops certain tubers (Fig. 16) having the aspect of little balls bout half an inch in diameter, flattened on one side, and in colour of a dirty white.[1] More closely examined, we perceive on the flattened side a depression or sort of umbilicus, attached to which the remains of an enveloping membrane may sometimes be found. Around the depression, and extending over half the tuber, are a number of little pits. The tubers are brittle, yet soft enough to be easily cut with a knife. Their cut surface is perfectly white, and shows no trace of concentric layers, or other structure than a uniform mass of starchy, cellular tissue.

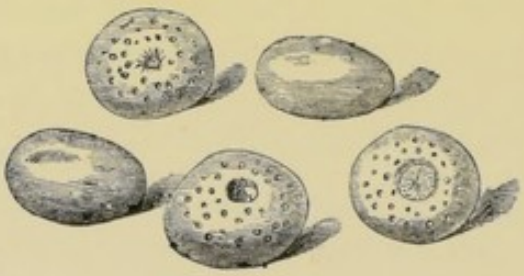


Fig 16.

Mr. H. G. Schott, of Vienna, an authority of the highest eminence on *Aroideæ*, has obligingly examined these tubers,

[1] Grows about Pekin. Hance, *Linn. Journ.*, Bot. xiii. (1872), 88.

and has suggested that they are produced by *Pinellia tuberifera*, Tenore, a plant of wide distribution in China, as well as in Japan. 1860-62.

The name *Pwan-hea* (*sang* signifies *crude*) appears to be applied to several species of *Arum*.

南星 *Nan-sing;*[1] Tuber of *Arum pentaphyllum*, L. (*Aroideæ*); Tatar., *Catal. Med. Sinens.*, p. 40; Cleyer, *Med. Simp.*, No. 88, *Nan-sing.*

Hard, whitish tubers, ½ an inch to 1½ inch across, of flattened spherical form, having a depression, generally surrounded with little pits, on the upper surface, marking the situation of the bud. Many of the larger tubers have smaller ones branching from them. In the dry state the drug has but little smell and taste; yet when chewed, even in minute quantity, it proves exceedingly acrid. Both Cleyer and Loureiro[2] enumerate many virtues ascribed to this drug, but they are too indefinite to merit much attention.

This drug resembles the preceding (*Sang-pwan-hea*), but the tubers of this attain much larger dimensions and are far less regular in form and size.

WOODS, BARKS, &c.

沉香 *Chin-heang;* Wood of *Aquilaria Agallocha*, Roxb. (*Aquilarineæ*); *Chîn hiam̄*, Cleyer, *Med. Simp.*, No. 208; *Sinkoo*, Kæmpfer, *Amœnitates*, p. 903; *Agallochum, Calambac, Agila Wood, Aloes Wood.* Lign Aloes.

The history of this celebrated substance, which is the *aloes* or *lign aloes* of the Scriptures, is so replete with interest, that it is difficult to bring even the most succinct account of it within due bounds. I will, therefore, refer the reader who wishes for further information to the authors cited below.[3]

It may in the first place be observed that this, the Biblical aloes, has no relation with the extract now called by that name,

[1] The plant to which Kæmpfer (*Amœn.* p. 786) applies these characters is the *Arum triphyllum* of Thunberg's *Flora Japonica*, p. 233.

[2] *Flora Cochinchinensis*, ed. Willd., p. 652.

[3] Guibourt, *Hist. des Drog.*, éd. 4, tome iii., p. 313; Roxburgh on the genus *Aquilaria*, *Linn. Trans.*, vol. xxi., p. 199; Royle, *Illustrations of the Bot. of the Himalaya*, vol. i., p. 171; Loureiro, *Flora Cochinchinensis*, ed. Willd., p. 327.; Kæmpfer, *Amœnitates*, p. 903; Finlayson, *Mission to Siam and Hué*, pp. 94-258.

1860-62. and that it does not possess even the most well-known character
Lign Aloes. of that drug—intense bitterness. Aloes wood is the produce of *Aquilaria Agallocha*, Roxb., a tree of vast size, growing in the mountainous parts of Cochin-China, the Laos country, and adjoining regions, and extending westward into Silhet and Assam.[1] The wood in its ordinary state is not valued as a drug, being pale in colour, light, and inodorous. But under certain conditions a change takes place in portions of both trunk and branches, the wood becoming gorged with a dark, resinous, aromatic juice, and acquiring a greater specific gravity. It is these portions of the wood that constitute the drug in question, which is esteemed the more in proportion as it is ponderous and abounds in resinous matter. In Silhet, the collection of aloes wood is a precarious and tedious business; those engaged in it proceed some days' journey into the hilly districts, where they fell any trees they may find, young or old, and then, on the spot, search them for
Aggur. the *aggur*, as the valued wood is called. This is done by chopping off the bark and into the wood, until they observe dark-coloured veins, indicating the proximity of wood of valuable quality, which generally extends but a short distance from the centre of a trunk or branch. In this manner a whole tree is searched through, the collectors carrying away only such pieces as are rich in odoriferous resinous matter. In some districts it is customary to facilitate the extraction of the resinous wood by burying portions of the tree in moist ground, or by allowing the entire tree to remain a length of time after it is cut down, the effect of which is to cause decay in the non-resinous wood, and thus render it easily removable by an iron instrument. I have specimens of aloes wood in which this process has evidently been adopted. Aloes wood is sorted by the collectors into various qualities, the finest of which, called
Ghurkee. *Ghurkee*, is worth in Silhet from 12*s.* to 16*s.* per pound.[2] As may readily be imagined, the drug occurs in pieces of extremely irregular shape and size; I have seen none exceeding a pound

[1] *Garroo* or *Eagle Wood* collected in the interior of the island of Hainan and bartered by the Aborigines, *Trade Reports for* 1867 (Appendix).

[2] *Aquilaria Agallocha* and *A. malaccensis*, both occur in Sumatra and also according to Teysmann in Banka. Miquel, *Prod. Flora Sumatranæ*, 1860.

1860-62.

Lign Aloes.

in weight, while some of excellent quality is met with as small chips and splinters. The larger pieces have mostly been scooped and trimmed with great care, so as to remove, as far as possible, all the less resinous portions. The wood is of a deep brown colour, marked more or less distinctly with innumerable coarse parallel veins loaded with resinous matter. A good sample yielded me 48 per cent. of matter soluble in rectified spirit. The wood has a slightly bitter, aromatic taste; its odour is peculiar and not remarkably agreeable; some persons compare it to sandal wood, others to ambergris. In the Bible we find it associated with other perfumes, as in the Psalms[1] and Proverbs[2] with cassia or cinnamon, and myrrh, in the Canticles[3] with spikenard, saffron, calamus, cinnamon, frankincense, and myrrh, and again with myrrh in the New Testament,[4] where it appears such a mixture was used in embalming the body of our blessed Lord.

Biblical associations.

In the present day, aloes wood is chiefly used in China, where it is principally consumed as incense. It is, however, to be met with in all Eastern bazaars, including those of Syria, where I have myself seen it for sale. In Silhet it seems to be chiefly collected for the sake of extracting from it a sort of essential oil or oleo-resin, which is obtained, according to one account, by distillation, according to another, by infusing fragments of the wood in boiling water, and collecting the "*uttur*" (oil) that rises to the surface. I have a sample of this *uttur* which has been prepared, as I judge, by the former process.

Uttur.

Aloes wood has long had a place in the Materia Medica of the Pharmacopœias of Europe, but the finer qualities of the drug have hardly ever been imported. It does not appear to possess any properties that call for its admission to modern medical practice.

牙香 *Ya-heang;* Wood of (?) *Aquilaria Chinensis,* Spreng. (*Aquilarineæ*); a light, spongy wood formed of coarse parallel fibres, devoid of aroma, but having a bitterish taste. I have referred it, upon the authority of Mr. S. Wells Williams,[5]

Ya-hcang.

[1] Psalm xlv. 8.
[2] Prov. chap. vii. 17.
[3] Cant. chap. iv. 14.
[4] John, chap. xix. 39.
[5] *English and Chinese Vocab.*, p. 103.

1860-62. to *Aquilaria Chinensis*, Spreng. (*Ophispermum Sinense*, Lour.), but with doubt, since the Chinese name given by Loureiro for that tree is *Pă mŏu yong*.

Haw-pŭh. 厚朴 *How-pŭh ;* Bark of *Magnolia hypoleuca*, S. et Z. (*Magnoliaceæ*) ; *Heú-pŏ*, Cleyer, *Med. Simp.*, No. 200 ; Tatarinov, *Catal. Med. Sinens.*, p. 8 ; *Pun-tsaou*, Fig. 735.

A rough, thick bark, which in my specimen has been tightly rolled round several times, so as to form a cylinder 7 inches long by 2½ in diameter. The bark has a bitterish, pungent, aromatic taste, and is prized by the Chinese on account of its reputed tonic and invigorating properties.

Hwang-pĭh. 黃栢 *Hwang-pĭh ;* Bark of *Pterocarpus flavus*, Lour. (*Leguminosæ*) ; Tatarinov, *Catal. Med. Sinens.*, p. 9.

Stated by Loureiro to be resolvent and vulnerary ; also to be used as a yellow dye for silk.

Naou-yang-hwa. 鬧楊花 *Naou-yang-hwa ;* Flowers of *Rhododendron ?* (*Ericaceæ*) ; Cleyer, *Med. Simp.*, No. 186.

Used in conjunction with aconite root as a topical application to produce insensibility to the pain of a surgical operation (*vide* p. 258). Dr. Horaninow refers this Chinese name to *Hyoscyamus.*

Shĭh-wei. 石韋 *Shĭh-wei ;* Fronds of *Niphobolus Lingua*, Spr., *Acrostichum Lingua*, Thunb. *Flor. Jap.*, tab. 33 (*Filices*) ; *Pun-tsaou*, Fig. 474.

Woo-pei-tsze. [Galls.] 五倍子 *Woo-pei-tsze ;* Galls of *Rhus semi-alata*, Murr. (*Anacardiaceæ*) ; *U poì çù*, Cleyer, *Med. Simp.*, No. 225 ; *Pun-tsaou*, Fig. 839.

These galls now constitute so regular an article of commerce that it is not needful here to describe them. Some pharmacologists have asserted that *Distylium racemosum*, S. et Z., a large tree of the nat. ord. *Hamamelideæ*, growing in Japan, is the plant upon which they are produced. That this is erroneous I have satisfied myself,—1. By an examination of herbarium specimens of this plant, and of *Rhus semi-alata*, Murr. 2. By an examination of original packages of the galls, imported from China and Japan, which I find to contain the leaf-stalks and remains of

flowers of *Rhus*, but never anything which I could trace to *Distylium*. 3. By the completely different form of the galls of the *Distylium*, as figured by Siebold and Zuccarini in their *Flora Japonica*, tab. 94. 1860-62.

Chinese galls (so-called) have lately been imported from Japan; they are somewhat smaller than those shipped from China, but appear to be produced by the same tree.

沒石子 *Mŭh-shĭh-tsze;* Galls of *Quercus* sp. (*Amentaceæ*); *Pun-tsaou*, Fig. 756. *Mŭh-shĭh-tsze.*

These do not differ from the galls of *Quercus infectoria*, Oliv., the common Aleppo galls of Europe, mentioned as an import into China, in 1514,—see Barbosa, also Porter Smith.

茯苓 *Fŭh-ling; Pachyma Cocos*, Fries (*Fungi*); *Lycoperdon solidum*, Gronovius; *Pĕ fŏ lîm*, Cleyer, *Med. Simp.*, No. 189; Tatarinov, *Cat. Med. Sinens.*, pp. 2-23; *Pun-tsaou*, Fig. 822; Indian Bread, or Tuckahoe.[1] *Fŭh-ling.* vel *Pachyma Cocos.*

A very remarkable substance resembling large, ponderous, rounded tubers, having a rough, blackish-brown, bark-like exterior, and consisting internally of a compact mass of considerable hardness, varying in colour from cinnamon-brown to pure white. These tuberiform bodies which in weight vary from a few ounces up to several pounds, are found attached to the roots of fir-trees, or sometimes buried in the ground in localities where firs no longer grow. They occur in South Carolina, in some of the northern and western provinces of China, and in Japan. Their true nature is sufficiently perplexing. The older writers, as Martinius and Cleyer, considered them to be a sort of *China*

1 *Fŭh-ling.*—Consult a paper by Paravey *Sur l'Origine du Succin, du Fouling*, et Truffes diverses . . . Bordeaux, *Soc. Linn.* actes xvii., (1851) 40–53.

P. Champion finds *Pachyma Cocos* to yield a substance which he has named *Pachymose;* it is insoluble in water, soluble in potash, and forms insoluble compounds with salts of lead or lime. Treated with warm hydrochloric acid it reduces potassio tartrate of copper, and in presence of fuming nitric acid it forms a very combustible compound, which detonates like gun-cotton when struck. Its composition corresponds to the formula C_{10} H_{24} O_{14}. Abstracted from *Comp. Rend.* lxxv., 1526, in *Journ. of Chem. Soc.*, March 1873, p. 283.

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Pachyma Cocos.

Root (*Smilax*), a supposition which their outward appearance certainly favours, but which is immediately negatived when we find them to contain no trace of starch. Loureiro and Endlicher are content to describe them as *tubers* found upon the roots of fir-trees. Other botanists have placed them among *Fungi*; Gronovius and Walter in the genus *Lycoperdon*, Schweinitz in *Sclerotium*, Oken, Horaninow, and Fries in *Pachyma*.[1] The latest observations on the subject are some which were submitted to the Linnean Society by Mr. F. Currey and myself, and published in the *Linnean Transactions*.[2] The opinion there expressed is that these tuber-like bodies are an altered state of the root of the tree, probably occasioned by the presence of a fungus, the mycelium of which traverses, disintegrates, or even obliterates, the wood and bark. This mycelium appears under the microscope in the form of fine threads, usually more or less mixed with bodies of irregular shape, somewhat resembling starch-granules, but which are, apparently, cells of the woody tissue in a more or less advanced state of disease and distortion. Nothing is known of the more developed form of the fungus represented by this mycelium.

American *Fŭh-ling.*

The American *Fŭh-ling* has been examined chemically by Professor Ellett, of South Carolina College, who has stated it to consist entirely of pure pectine of Braconnot;[3] but I think its composition deserves some further investigation. I find that the pure-white internal substance (which is quite insipid and inodorous) is very slightly soluble in cold rectified spirit and in cold water, and not more so when boiled in water, the solution in each case yielding a flocculent precipitate with acetate of lead. When boiled in a weak solution of carbonate of soda, the substance dissolves rather more freely, and the solution affords a scanty gelatinous precipitate (*pectic acid?*)

[1] Also Du Halde's *Descrip. de la Chine*, 1735, iii., 522.

[2] Vol. xxiii. p. 94, where the reader will find full references to the botanical works here referred to, as well as figures of *Pachyma Cocos*, Fries. See also Berkeley *On some Tuberiform Productions from China*, *Journ. of Proceedings of Linn. Soc.*, vol. iii., *Botany*, p. 102, where there is a translation from the Chinese regarding these substances.

[3] Berkeley, *l.c.* p. 106.

when treated with an acid, or (*pectate of lime ?*) with a solution of lime. 1860-62.

In China the *Fŭh-ling* is made into edible cakes, which are frequently sold in the streets; it is also reputed medicinal in a variety of disorders. In America it has also been used as an article of food, whence the name *Indian Bread.* Indian Bread.

豬苓 *Choo-ling;* Berkeley, *Journal of Proceedings of Linnean Society*, vol. iii. 1859, *Botany*, p. 102; Currey and Hanbury, *Linn. Trans.*, vol. xxiii. p. 95, tab. 9, Figs. 10-13; *Chū-lîm*, Cleyer, *Med. Simp.*, No. 207; Tatarinov, *Cat. Med. Sinens.*, p. 17; *Pun-tsaou*, Fig. 824. See Porter Smith's *Contributions*, p. 206, line 3. *Choo-ling.*

Tuberiform bodies of much smaller size, less regular shape, as well as less ponderous than the preceding; they are covered with a thin, black, more or less shrivelled cuticle, which closely invests a homogeneous, corky, yellowish-brown substance. The microscopic structure of these quasi-tubers resembles that of the *Fŭh-ling;* but the threads by which their substance is traversed are more interwoven and more branched, and have not the appearance of being the mycelium of a fungus. The same irregularly shaped bodies as seen in *Fŭh-ling*, are also present, but their dimensions are smaller. In a few specimens, an abundance of doubly prismatic crystals has been noticed. "Treated with the same chemical tests as the *Foo-ling*," remarks Mr. Berkeley, "it [the *Choo-ling*] exhibits precisely the same reaction. There is not the slightest trace of starch or cellulose, and it is evident that the structure is not accordant with that of any fungus or phænogamous tuber."

The *Choo-ling* is stated by Chinese authors to be parasitic on a tree, beneath which it is picked up in spring and autumn, many fanciful virtues not worth repeating are attributed to it.

雷丸 *Luy-wan; Mylitta lapidescens*, Horaninow (*Fungi*); Tatarinov, *Catal. Med. Sinens.*, p. 34; Currey and Hanbury, *Linn. Trans*, vol. xxiii. p. 96, tab. 9, Fig. 14–17; *Lâi uôn*, Cleyer, *Med. Simp.*, No. 227; *Pun-tsaou*, Fig. 825. *Luy-wan*, vel *Mylitta Lapidescens.*

This substance occurs in the form of small rounded nodules, varying in weight from five grains to nearly half-an ounce. Their

1860-62. *Mylitta lapidescens.*

exterior surface is of a dark brownish-grey colour, and generally finely corrugated: their inner substance has a granular appearance, is of a pinkish-brown colour, and of almost stony hardness. A microscopic section shows that the tissue is divided into *areolæ* after the manner of that of the truffle and other underground fungi; no trace of fructification has been observed in any specimen.

This curious vegetable production, which had previously only been known from its occurrence in the drug-shops of China, has lately been obtained in Southern India by Dr. E. J. Waring, who states that it is dug from the chalk-beds in the mountains separating Travancore from Tinnevelly. In India, as in China also, it is used as a medicine, being regarded as powerfully diuretic.

Liquid Benzoin.

水安息香 *Shuy-gan-seih-heang;* literally, *Liquid Benzoin.* This drug is a dark-brown, semi-fluid resin, having an extremely fragrant odour of storax. It is met with in small globular wooden shells, apparently the pericarp of some fruit, about $1\frac{3}{4}$ inch in diameter, closed with wax. Its origin is very obscure. The Chinese assert that they import it from the Straits, or, in other words, by way of the Indian Archipelago; but I have not been able to trace it either there or in Siam. It is curious moreover, that this fragrant resin, even to the shell inclosing it, is extremely like that kind of balsam of Peru which was brought to Europe long ago in the capsules of a *Lecythis*, and naturally supposed to be a product of South America.

The *Liquid Benzoin* is very expensive, a single shell, holding perhaps half an ounce, being worth four dollars, or 20*s*.

Sung-heang.

松香 *Sung-heang; Sum hiam,* Cleyer, *Med Simp.*, No. 190; Tatarinov, *Catal. Med. Sinens.*, p. 50.—A pale-yellow terebinthinous resin, closely resembling mastich, occurring in small irregular tears, somewhat opaque externally from mutual friction, but perfectly transparent within, and exhibiting a vitreous fracture. It would be a good substitute for mastich.

The name *Sung-heang* is said to be also applied to other terebinthinous resins.

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冰片 *Ping-peën;* Camphor of *Dryobalanops Camphora,* Colebr. (*Dipterocarpeæ*); Borneo or Baros Camphor. Dryobalanops Camphor.

Obtained chiefly in Sumatra from fissures in the interior of the trunk of the tree. As the best tree when felled rarely yields more than a few ounces, the drug is very costly, being worth on the spot about 50*s.* per lb. It is chiefly exported to China, but a considerable quantity is consumed in the island for the purpose of embalming the bodies of the petty chiefs, a custom the expense of which often proves exceedingly ruinous to the family of the deceased. The best quality of this camphor occurs in the form of flat colourless crystals, the largest of which rarely exceeds half an inch across. An inferior quality is coarse, pulverulent, and of a grey colour. Dryobalanops camphor has the odour of common or laurel camphor, mixed with something that has been likened to patchouli. It is less volatile than laurel camphor, and has a greater specific gravity, so that it sinks into water. Its composition is $C_{20}\ H_{18}\ O_2$, that of laurel camphor being $C_{20}\ H_{16}\ O_2$.

蟲白蠟 *Chung-pĭh-lah;* Chinese Insect Wax; *Pun-tsaou,* Fig. 837. Secreted by *Coccus Pe-la,* Westw.,[1] upon the branches of *Fraxinus chinensis,* Roxb., which is cultivated for the purpose, and possibly upon other trees. Some accounts of the habits of the insect by a competent observer are much required, the Chinese statements on the subject being extremely obscure. Chinese Insect White Wax.

石决明 *Shĭh-keue-ming;* Shells of *Haliotis funebris,* Reeve; *Pun-tsaou,* Fig. 969; Tatarinov, *Cat. Med. Sinens.,* p. 54.; Cleyer, *Med. Simp.,* No. 172.

[1] Mr. Westwood's description of this *Coccus* was published in the *Gardeners' Chronicle* for 30th July, 1853. Part of the woodcut that accompanied it I have caused to be copied, and have added to it a figure of *Fraxinus chinensis,* Roxb., in fruit, and one of a branch of that tree coated by the insect with its waxy secretion,—both taken from specimens in my own collection. In this cut (Fig. 17), A. represents the winged male insect, the body of which is of a dark chestnut colour; the abdomen and elongated anal point reddish-buff; legs reddish, thighs brown, wings very slightly stained with brownish-buff, and the two subcostal veins flesh-coloured. B. Female insect, showing the mode in which the body envelopes a twig. C. A very minute larva, half the size of a pin's head; and D. one of the young at a more advanced period of growth. See p. 272.



Fig. 17.—The Wax-tree (*Fraxinus Chinensis*, Roxb.); Wax-Insect (*Coccus Pe-la*, Westw.); and branch incrusted with the wax.

This shell is stated to occur on the coasts of Fŭh-kien and Kwantung. Messrs. Cuming and Lovell Reeve, who have examined it, concur in referring it to *Haliotis funebris*, a New Holland species, figured by the latter gentleman in his beautiful *Conchologia Iconica*, sect. *Haliotis*, pl. xii. 38. 1860-62.

龍骨 *Lung-kwŭh;* literally, *Dragon's Bones; Lûm cŏ,* Cleyer, *Med. Simp.*, No. 252; *Pun-tsaou*, Fig. 888. *Lung-kwŭh.*

This commodity is sold in the Chinese shops in irregular pieces of a few ounces weight, curiously covered with paper and marked with a stamp. Upon placing a thin slice of it under the microscope its true nature is revealed, and it is proved to be *fossil ivory.* Many imaginary virtues are attributed to it, as well as to the following.

龍齒 *Lung-che;* literally, *Dragon's Teeth.*—These also are fossil, and obtained, according to the Chinese, in the north-western provinces of Shen-si and Shan-si. Mr. G. R. Waterhouse, of the British Museum, who has, at my request, been good enough to examine a considerable number of specimens, is able to distinguish among them the following:—molars of the lower jaw of *Rhinoceros tichorhinus*, Cuv.; fragment of tooth of *Mastodon;* of *Elephas*, near *E. insignis*, F. et C.; many molars of *Equus*, teeth of *Hippotherium*, comprising molars of both jaws, agreeing perfectly with those of the *Hippotherium* of Germany and France; an upper molar of a *Hippotherium* probably distinct from the preceding; portion of an upper jaw, with the four posterior molars, of a ruminant allied to the sheep, but of smaller size: molar teeth of two species of stag; molar tooth of bear.[1] *Lung-che.*

石蟹 *Shĭh heae;* Fossil Crabs of the Post-Tertiary Period. *Pun-tsaou*, Fig. 66. *Shĭh heae.*

A celebrated Chinese medicine mentioned by Kircher, Grosier, Du Halde, Cleyer and others, and supposed to be an antidote to all kinds of poison, as well as to possess innumerable other virtues.

[1] Prof. W. Boyd Dawkins, of Owens College, Manchester, has ascertained that there are caves in Borneo which are extensively worked for teeth for the Chinese market. (Note from H. Woodward, 9, viij., 1870.)

1860-62.

Fossil crabs.

The specimens which I have received, and which are said to be obtained in the island of Hainan and on the opposite shores of Kwang-si, belong to a single species, *Macrophthalmus Latreillii*, Edw., (*Gonoplax Latreillei*, Desm.), with the exception of one which is referable to a species of the genus *Cancer* not yet described. Probably identical with *M. Latreillii* is the fossil *M. Desmarestii*, described and figured by M. Lucas in the *Annales de la Société Entomologique de France*.[1] Nor is the animal found merely in the fossil state, for, as pointed out to me by Mr. H. Woodward, of the British Museum, who has examined the subject with care, a recent species found in the Philippines, and named by Mr. Adam White *M. serratus*,[2] appears to possess no character that can distinguish it from the fossil form.

My friend M. Rondot, of Paris, obtained from the Chinese *pharmaciens* at Canton, in addition to specimens of the *Macrophthalmus*, a fine example of *Portunus* (*Lupa*) *leucodon*, Desm., recently shown by Dr. Alphonse Milne-Edwards[3] to be identical with the *Scylla serrata* of De Haan[4] still found living in Japan, the Philippines and at Port Natal. It is a much larger crab than the others, measuring seven to eight inches across the carapace. There are several very perfect specimens of it, reputed to be from the Philippines, in the geological collection of the British Museum.

Shïh-yen.

石燕 *Shïh-yen ;* Fossil Shells ; Tatarinov, *Cat. Med. Sinens.*, p. 54.; *Pun-tsaou*, Fig. 65.

These fossils have been examined and described by Mr. Thomas Davidson, to whose account and figures in the *Proceedings of the Geological Society* (June 15, 1853), I refer the reader who wishes for full details. The actual specimens are in the British Museum. Mr. Davidson remarks that the specimens belong to eight Devonian species, seven of which are common to several European localities, among which may be mentioned Ferques

[1] Vol. viii. Série 1, 1839, p. 567, t. 20.
[2] *British Museum List of Crustacea*, London, 1847, p. 37.
[3] *Annales des Sciences Naturelles*, Zoolog., tom. xiv. (1861), pl. i. and ii See another paper by Alph. Milne-Edwards in tome xviii. (1862) p. 31.
[4] *Fauna Japonica*, 1835.

Néhou (France), Belgium and the Eifel, but they are not found all existing together in any one of these localities. In external aspect the Chinese specimens most resemble those from Ferques, where, however, two of them, *Cyrtia Murchisoniana* and *Rhynchonella Hanburii*, have not yet been discovered. If to these be added two described by M. de Koninck, the total number of Chinese Devonian types at present known will amount to ten species, viz.:—3 *Spirifer*, 2 *Rhynchonella*, 1 *Productus*, 1 *Crania*, 1 *Cornulites*, 1 *Spirorbis*, and 1 *Aulopora*. 1860-62. Fossil shells.

These fossils are asserted to occur in the southern province of Kwang-si, where coal is also met with.

Additional Note.

Insect-White-Wax.—T. T. Cooper,[1] who passed through the white-wax country of Szechuen in 1869, describes it as an extensive plain surrounded by low hills, lying between Ya-tzow-foo and Kia-ting-foo, *i.e.*, nearly south of Chen-tu-foo, the capital of the province. The country was all under wax and rice cultivation, the wax-trees being planted on the small embankments surrounding paddy fields, which are at most but thirty yards square. The trees have the aspect of stumps uniformly about eight feet in height, and as thick as a man's thigh. The wax cultivation is a source of great wealth, second only to silk. Insect-White-Wax.

The eggs of the insect are all imported from Yunnan, and arrive in Szechuen in March. Towards the middle of March the trees put forth leaves and shoots, on which the young insects attach themselves; by July all the branches are thickly crusted with wax; in the beginning of August they are lopped off close to the trunk, cut into small lengths and taken to the boiling houses, where they are transferred to large cauldrons of water and boiled.

[1] *Travels of a Pioneer of Commerce*, 1871, pp. 428-430.—Also p. 323.

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NOTE ON CHINESE SAL AMMONIAC.

(Chinesischer Salmiak.)

AMONG a numerous collection of Chinese drugs, a report upon which I published in the *Pharmaceutical Journal* in the years 1860-61, and 62, was a substance called *Naou-sha*, which particularly excited my curiosity, on account of the enormous price at which it is valued by the Chinese, and the remarkable virtues ascribed to it. But as is the case with many similar substances (of which we are not without parallels in European medicine) the value of this drug proved to be due, not to its peculiar properties, so much as to the superstition and ignorance of those who sell or administer it.

Naou-sha.

The first sample I received was accompanied with the inquiry if it were not iodide of potassium, and had it been that substance one could hardly be surprised that even twenty dollars an ounce might be paid for it. It was a rounded fragment of a substance of dark colour and compact crystalline structure, which chemical examination proves to be chloride of sodium. Since his return from China, my friend Mr. Lockhart has kindly placed in my hands a more ample supply of this substance, the examination of which has shown that though essentially chloride of sodium, it contains traces of alkaline sulphuret, and that it resembles in composition and general appearance one of the forms of impure chloride of sodium found in the bazaars of India under the name of *Black Salt*.

Indian Black Salt.

Tatarinov, in his *Catalogue of Chinese Medicines*,[1] represents the name *Naou-sha* to be applied to sal ammoniac of volcanic origin, and in Pekin at least such is truly the case. When my friend Mr. Lockhart was residing in that capital in charge of the hospital established under the auspices of the London Missionary Society, he took the opportunity of making some inquiries regarding the drug in question, and very recently he has handed me several specimens of it obtained in the Pekin shops. The information Mr. L. elicited was not very copious, in

[1] *Catal. Med. Sinensis*, p. 41.

1865.

fact all he could learn amounted to this—that *Naou-sha* is brought from certain volcanic springs in the province of Sze-chuen, and in Thibet, and that the various kinds of it, differing from one another chiefly in their degrees of purity, are distinguished by the names *Naou-sha*, *Yen-naou*, and *Shĭh-naou*.

Specimens from Mr. Lockhart shown to be chloride of ammonium.

The specimens received from Mr. Lockhart were of three kinds, the purest of which consist of a compact, crystalline, colourless, saline mass, which analysis proved to be chloride of ammonium. The second kind was also chloride of ammonium but of different appearance, having more of the aspect of a natural production than the first. The third specimen was likewise chloride of ammonium, but much contaminated with earthy matter.

There can be no doubt, I think, that this Chinese sal ammoniac is a volcanic product, such as is known to occur on Etna, Vesuvius, and Hecla, as well as in the vicinity of ignited coal-seams. Whether it is by ignorance or design that the Chinese confound it with an impure form of common salt, I cannot affirm; but the circumstance calls to mind the fact proved by Beckmann,[1] that the sal ammoniac of the ancients was common rock-salt, dug from pits near the temple of Jupiter Ammon in Egypt, and that the name was subsequently transferred to chloride of ammonium manufactured in that country from the dung of camels.

NOTE ON *ANACAHUITE WOOD*, A REPUTED REMEDY FOR CONSUMPTION.

1861.

Anacahuite Wood.

During the past autumn there have been several inquiries, chiefly on the part of merchants connected with Germany, for a new drug imported from Mexico under the name of *Anacahuite Wood*. A single package of this drug was offered for sale in September last by a London drug broker, and purchased for shipment to the Continent. In Germany the demand has been very considerable, and although 10,000 pounds of the wood

[1] *History of Inventions and Discoveries.*

1861. have been imported into Bremen and Hamburg, and sold at a high rate, the requirements of purchasers are still far from being satisfied.

In order to explain the circumstances that have led to the introduction of this new drug and the valuable properties which it is asserted to possess, I will here give the translation of a short paragraph extracted from a popular German journal into the pages of the *Archiv der Pharmacie* for November last :—

German account. There grows at Tampico, in Mexico, a tree with the wood of which, called *Anacahuite*, the Indians cure all chest complaints, especially diseases of the lungs. The inhabitants of Tampico have also used this remedy, and have succeeded in completely curing consumption with it, even in the case of persons in whose families the disease appeared to be hereditary. The Prussian Consul at Tampico has for years past observed the beneficial effects of this wood, and, as in all cases the patients were cured by the use of it, he has been induced to communicate the subject to the Prussian Government, and to send a considerable quantity of the wood to Berlin, where experiments are now being made in the hospitals to determine its medicinal efficacy.

Anacahuite wood is administered in the simple form of infusion, shavings of the wood, previously deprived of its bark, being treated with boiling water, as in the preparation of tea. This infusion is drunk in the morning fasting and again in the evening at bedtime. In cases where the disease has already made considerable progress, the infusion may be used as often as the patient is inclined to drink. Highly seasoned food and strong alcoholic beverages as well as coffee, must be avoided while the medicine is being used. Spitting of blood is removed in a few days ; in all cases, however, it is advisable to continue the use of the medicine for some time even after recovery.

Anacahuite wood, it will thus be seen, is a production of Tampico, whence, in fact, all the supplies that have reached Europe have been shipped. Its botanical origin is at present unknown. Dr. Otto Berg, who has elaborately described its external character and anatomical structure,[1] thinks that from the organization of the bark and wood it is probably derived from

[1] *Bonplandia*, 15th Oct., 1860, p. 302.

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some papilionaceous tree, although there are only general appearances that guide him to such an opinion. It is to be hoped, however, that this question may be soon set at rest by good, dried specimens of the flower, fruit, and leaf of the tree being obtained from Tampico, and submitted to some competent botanical authority in Europe.[1]

Description of Anacahuite wood.

Anacahuite wood, as I have seen it, consists of truncheons of about two feet long, varying from the thickness of a finger to that of a man's arm. The wood is covered with a thick, fibrous, greyish-brown bark, coarsely furrowed longitudinally with deep cracks, and so tough that it may be stripped off in pieces of considerable length. A white pulverulent matter, resembling an efflorescence, occurs between the layers of liber from which it escapes as dust when the bark is torn. When one examines a transverse section of a truncheon, one perceives the bark to be of considerable thickness and to consist of two more or less defined zones—the inner more compact. The wood is of a pale brown, marked with concentric zones, which, however, are too little distinguished from one another to be counted with any certainty. The pith is frequently eccentric ; its transverse section sometimes shows a stellate form.

Decoction of Anacahuite wood.

Anacahuite wood is inodorous and insipid. A strong decoction is transparent and of a sherry-brown colour ; it is blackened by a persalt of iron, but neither a solution of gelatine nor of iodine affects it. The taste of the decoction is extremely slight and unremarkable, so that one may reasonably be permitted to doubt the extravagant, though, if true, very gratifying assertions regarding the virtues of the drug. The experiments, indeed, that have been instituted in the Great Hospital at

[1] I have not been able to find any notice of Anacahuite wood in any author treating on Mexican Materia Medica whose works I possess. Hernandez (*Rerum Medicarum Novæ Hispaniæ Thesaurus*, Romæ, 1651, p. 67) mentions a tree called *Morbi Gallici arbor*, whose Mexican name, *Nanahuaquahuitl*, is, perhaps, not an impossible version of our *Anacahuite*. Heller (*Reisen in Mexiko*, Leipzig, 1853, Anhang. sect. 3) does not enumerate *Anacahuite* among the useful plants of Mexico ; nor do I find it in the catalogue of Mexican products (including a long list of woods) sent to the Paris Exhibition of 1855 ; or in the papers of Schlechtendal on Mexican wood contributed to the pages of the *Botanische Zeitung*.

1861. Berlin, have hitherto had, as I am informed by Dr. C. G. Mitscherlich, no satisfactory results. The details of the cases have not, however, yet been published. [*N. Repert. f. Pharm.*, x., 306.]

ORIGIN OF ANACAHUITE WOOD.

(Anacahuitholz, sein Ursprung).

1862. It is now about two years since the name of this drug appeared in the German pharmaceutical journals as a new remedy for consumption. Shortly subsequent to this period large quantities of Anacahuite wood were imported from Tampico, and extensive trials were made in Germany in order to determine whether the good effects which the wood was stated to produce in Mexico could be realized in Europe also. Chemical analysis[1] was also resorted to in order to discover whether it possessed constituents that could in any way explain its alleged beneficial action. The results of all this labour were by no means favourable to the new drug; its valuable effects in phthisis could not be observed; analysis did not indicate that it possessed any important medicinal properties, and as a natural conclusion, anacahuite wood was thrown aside as a remedy of no value.

Medical Value.

One question however remained, and that was: What plant is it which yields this drug? Upon this point until recently no information could be obtained. Dr. Otto Berg, of Berlin, Dr. Berthold Seemann, of London, and myself,[2] consulted all the authorities at our disposal, but without arriving at any positive conclusion. I also put myself in communication with Lieutenant-Colonel Cumberlege, our consul at Tampico, but his sudden death which occurred soon after, prevented my deriving the information I hoped he would be able to afford. Dr. Seemann, however, made a fortunate suggestion; he pointed out that according to Dr. Torrey, *Cordia Boissieri*, A. De C., is called by the

Botanical Source.

[1] Buchner, *Ueber das Anacahuite-holz*, in *Neues Repertorium für Pharmacie*, Bd. x. (1861) p. 97; also Müller, in *Vierteljahresschrift für Prakt. Pharm.*, Bd. x. p. 519.

[2] *Pharm. Journ., and Trans.* 2nd Series, vol. ii. p. 407, vol. iii. p. 164.



Cordia Boissieri.—Flowering Branch and Fruit.

1862.

Mexicans *Nacahuita*, a name sufficiently like *Anacahuite* to justify a suspicion of identity. This suspicion has been changed into certainty. In a recent number of *Flora*, occurs the following interesting notice, which is republished in *Bonplandia* of 1st November last.

Botanical origin.

In the summer of 1861, the Botanical Gardens of Göttingen received from Mr. Gresser, the Hanoverian consul at Tampico, two stems of the Anacahuite-tree, which although in a very unpromising condition upon arrival, yet by suitable treatment soon threw out new shoots. They have now grown into strong shrubs, and last winter produced flower-buds, the full development of which was, however, prevented by the unfavourable season. Mr. Gresser, at a subsequent period, sent also dried leaves of the Anacahuite, and the fruit preserved in alcohol,which, with the growing specimens, afforded data for determining the plant to be the *Cordia Boissieri* of Alphonse De Candolle, described in the 9th volume of the *Prodromus*, p. 478.

In the herbarium of Sir William J. Hooker, of Kew, there are good specimens of *Cordia Boissieri*, from which, with the permission of Sir William the woodcut on the preceding page has been made.

Properties of Cordiaceæ.

Touching the properties of the natural order *Cordiaceæ*, to which *Cordia* belongs, the remarks of Endlicher[1] are to the following effect. The pulp of the drupes is mucilaginous, viscid and astringent with some sweetness; in a few it is acidulous; the fleshy cotyledons contain a bland oil. The saccharine fruits of *Cordia Myxa*, L., a tree indigenous to tropical Asia, and cultivated in Egypt from a very remote period, were used by the ancients in coughs and other disorders of the respiratory organs on account of their soothing and laxative properties. In Europe they are now very rarely employed. The West Indian *Cordia Sebestena*, L., has similar virtues. Of some members of the order the wood and leaves are resinous and aromatic. The brown wood, elegantly veined with black, of *Cordia Rumphii*, Bl., has the odour of musk. The bark of *Cordia Myxa*, L., is frequently used in astringent gargles in India, and the root is reputed to be laxative.

[1] *Enchiridion*, p. 319.

CHEMICAL AND PHARMACEUTICAL PRODUCTS OF THE PROPOSED INTERNATIONAL EXHIBITION OF 1862.

(From the *Journal of the Society of Arts.*)

1861. Suggestions.

SIR,—As the project for holding a great Industrial Exhibition in the year 1862 is likely to be carried into execution, it becomes all those who feel an interest in the movement to offer what assistance they can towards its successful accomplishment.

From the pages of the *Journal* it appears that some of our colonies have already taken up the matter, and have resolved to contribute collections that shall fully represent their industrial resources. The execution of this design would probably be assisted, and the resulting collections enhanced in interest and value, if suggestions derived from the Exhibitions of 1851 and 1855 were drawn up and communicated, through the *Journal*, to committees abroad.

It is with this view that I take the liberty to offer some remarks upon the pharmaceutical products, both raw and manufactured, which we hope will figure in the collections of 1862, and upon their mode of exhibition and the information that should accompany them. If those interested in other subjects would, in like manner, draw up a few notes on points to which it is desirable to direct attention, I cannot but think that useful results would follow.

The remarks I have to offer will be best arranged under the respective heads of *Unmanufactured Drugs, Chemical* and *Pharmaceutical Products,* to which I will add a few observations on the *Manner of Exhibition* and *Catalogues.*

Raw drugs.

Unmanufactured Drugs.—Substances of this class are not very attractive objects to the general public, but they are often extremely interesting and instructive to the man of science, as well as to the manufacturer. In the London Exhibition of 1851 there was a considerable collection of such products, but a far finer at Paris in 1855. Specimens of raw drugs sent from foreign countries should be carefully packed, so that they may

1861.

Suggestions respecting Raw Drugs.

arrive in good condition; the great enemy to be guarded against being humidity, which occasions specimens to become mouldy. If sent from abroad arrangements should be made for examining them upon their reaching London, for rejecting any that have become spoiled, and placing such as are in a state for exhibition in suitable jars or cases. Every parcel should be labelled in the fullest and clearest manner, and each series of specimens should be accompanied by a list, giving fuller particulars than can be stated on a wrapper. In the case of a drug that is but little known, it is desirable to have the native name, and the scientific name also, whenever the latter can be given upon undoubtedly good authority. As a general rule, the economic product is the only part of a plant which it is needful to exhibit, but there are cases in which it would be extremely desirable to procure such specimens as would illustrate the origin of such product, and the method of obtaining it. Thus *Balsam of Tolu*, a production of New Granada, would be vastly more interesting if accompanied by pressed and dried specimens of the tree (now almost unknown) from which it is derived; and the same remark applies to sarsaparilla, to myrrh, to gamboge, to olibanum, and to numerous other drugs.

In the Paris Exhibition of 1855 there was a large collection of drugs from India, but unfortunately it was very ill-arranged. Many products, in fact, were never made accessible for exhibition at all, and could only be examined upon leave being obtained to open the bags containing them. Some specimens were placed in *stoneware* bottles, so that inspection was out of the question; while a vast number from Ceylon and from Java, Sumatra, and other islands of the Indian Archipelago, were destitute of intelligible labels, and wholly unarranged. It was also remarkable that the pharmaceutical raw products of some important countries were entirely unrepresented; and that while there were admirable collections from French colonies, such as Pondicherry and Bourbon, and from some of our own colonies, as Jamaica and Demerara, almost nothing was contributed by Brazil, our settlements in China, our possessions on the West Coast of Africa, or the Island of Trinidad.

1861.

Chemical and Pharmaceutical Products.—This is a class of articles the exhibition of which draws forth a far more competitive spirit than the last; and considering the progress that manufacturing chemistry has made during the last few years, and the liberal character of our import duties, there cannot fail to be an ample display of contributions, both British and foreign. The experience of former Exhibitions does not suggest many remarks regarding this class of substances. I may, however, mention that enormous specimens of crystallized salts, such as the ferrocyanide of potassium, sulphate of copper, &c., shown in Paris in 1855, are less indicative of the goodness of the articles than of the expense and trouble of conveying them from the manufactory to the place of exhibition. Hydrochloric or sulphuric acids, in glass jars containing *gallons* (such as I saw in Paris in 1855), are also quite as efficiently represented by smaller samples. The excessive absurdity of an entire case filled with dozens of bottles of cod-liver oil, of one and the same sort, all properly sealed and labelled, and apparently ready for sale, need not be insisted on, and we may well wonder that such a display should be admitted. Specimens again, which are exhibited chiefly for their beauty of appearance, and which are evidence of no special skill on the part of the manufacturer, should bring little credit to the exhibitor. Of how much greater scientific value was the series of Dr. Frankland's organic radicals in the Paris Exhibition, than the heaps of brilliant, iridescent bismuth that so plentifully decorated the cases of many of the French chemical manufacturers.

Commonsense recommended.

Manner of Exhibition.—Under this head I would say a few words regarding the bottles and other receptacles in which specimens should be placed. In the Paris Exhibition there were vessels of honour, and vessels of dishonour,—stone bottles, utterly impervious to light, and vases so elaborately cut and gilt that their contents were hardly more perceptible. Of course such extremes should be avoided; moreover, bottles should not (except where essential for the preservation of the specimens) be hermetically closed, but should be fitted with such covers that the contents can be readily examined by those authorized

Containing vessels.

1861. Labels. to do so. Every specimen should be most clearly and legibly labelled; but even in this we may have an excess. I have seen a nice series of jars from one of our colonies, the contents of which were almost completely hidden by the amplitude of the paper labels pasted round the glass. Labels, indeed, should give their information briefly, fuller details being reserved for catalogues, of which I will now speak.

Importance of catalogues. *Catalogues.*—These are very desirable for all considerable collections of raw materials. In the Exhibitions of 1851 and 1855 there were several catalogues of particular departments, which could be had by those who felt interested to apply for them, though some, printed abroad, were difficult to obtain. The colonies of Algeria and British Guiana published very good catalogues, which may still be usefully referred to for information regarding the products of those countries in 1855. On the other hand, the products of Guatemala, New Granada, and Paraguay (and to some extent those of Mexico) were greatly diminished in interest from the impossibility of obtaining the information which well drawn-up lists would easily have afforded.

MINOR NOTES ON THE MATERIA MEDICA OF THE INTERNATIONAL EXHIBITION.

(*Arzneistoffe der Weltausstellung.*)

1862. Contrayerva Root.—It has long been known to pharmacologists that this drug, as found in the shops, is not derived from *Dorstenia Contrajerva*, Linn., but that it is usually the root of another species, *D. brasiliensis*, Lam. The Exhibition, however, contains two specimens of contrayerva root which are ascribed and, I have no doubt, correctly, to *D. Contrajerva*. One of them has been forwarded by M. Bélanger, of the Botanical Garden of St. Pierre, Martinique, the other by Mr. Devenish, of Trinidad. Dr. Crüger, the Colonial Botanist of Trinidad, states that the drug is in great repute among the Spaniards of the island as an alexiteric. Contrayerva root has become nearly obsolete in European medical practice, and, indeed, almost of necessity, for it is very scarce, and the little that can be found is usually old

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and worm-eaten. Were it necessary to re-introduce it, supplies could be obtained from Trinidad, in certain localities of which island, I am informed by Dr. Crüger, *D. Contrajerva* is abundant.

PODS OF MYROSPERMUM.—The Trinidad collection of drugs contains a good specimen of the entire legumes of *Myrospermum frutescens*, Jacq., a tree known in the island by the name of *Guatamare*. These legumes are a very popular stomachic and carminative, and are also used externally in the form of tincture, for pains, etc. The tree, which in Trinidad attains an altitude of from sixty to one hundred feet (and hence bears a very improper specific name), yields from incisions in its stem a small amount of balsamic resin which hardens in the air and is then undistinguishable from Balsam of Tolu. None of this resin is collected in Trinidad, where the tree is not very abundant and apparently not indigenous. Young plants of *M. frutescens*, raised from seeds sent by Dr. Crüger, may be seen in the Royal Gardens of Kew.

Guatamare from Trinidad.

Pods of *Myrospermum*, having the posterior or winged portion broken off, are also sent to the Exhibition from Venezuela. No information accompanies them, except that they are called *Sereipa*, and are from the province of Guayana. Careful inspection shows that they are the produce of two species, the smaller pods being apparently those of *M. frutescens*, Jacq., and the larger those of some other species which I cannot identify.

Sercipa from Venezuela.

MANNA.—Very few pharmacologists having seen any other form of this drug than that derived from the Manna ash (*Fraxinus Ornus*, L.), it is peculiarly interesting to find among the Materia Medica of the Exhibition at least four other kinds of manna, namely the following:—

Manna.

1. *Manna of the Oak.*—Mr. S. H. Maltass, of Smyrna, has sent, together with various other interesting drugs, a saccharine substance called *Diarbekir Manna* respecting which he has given me the following information, upon the authority of a relative who resided for two years in Diarbekir. The manna is found upon the leaves of the dwarf oaks, from which it is collected by the peasants, who use it instead of butter in cooking their food,

Diarbekir [oak] Manna.

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and ascribe to it no purgative properties, at least while it is fresh. The manna is deposited upon the trees much more copiously after misty weather than at any other period. The

Oak Manna.

sample of oak-manna in the Exhibition constitutes a moist but solid mass of agglutinated tears, closely resembling some of the common qualities of ash-manna. Its taste is simply saccharine, and agreeable.

Australian [*Eucalyptus*] Manna.

2. *Eucalyptus Manna.*—There are several specimens in the Exhibition of this substance, which is found in the form of small rounded opaque-white masses upon the leaves and younger branches of *Eucalyptus viminalis*, La Bil. The exudation, which is said to result from the punctures of insects, takes place most copiously in the early part of summer, at which time the manna appears as a transparent liquid, resembling thin honey, and gradually solidifies. This Australian manna has not hitherto been collected for medicinal purposes.

Lerp [Australian].

3. *Australian Insect-Manna* called *Lerp.* — Having only recently obtained a specimen of this substance, which to me was previously unknown, I am unable to offer much information respecting it. According to the *Victorian Exhibition Report*, published at Melbourne this year, we find the leaves of *Eucalyptus dumosa*, Cunn., called by the colonists *Malle Scrub*, become coated at certain seasons of the year with an opaque white saccharine substance in such profusion, that the shrubby vegetation has the appearance of being *iced*. This substance, which among the aborigines of the northern districts of the colony obtains the name *lerp*, is the secretion of an insect of the *Psylla* family, and consists (judging from the specimen in my possession) of a series of depressed hemispherical cells, each from a tenth to a sixth of an inch in diameter, placed contiguous to each other, and adhering together so as to form irregular flakes, sometimes an inch or more across. These cells are composed of a semi-transparent, colourless, or yellowish substance, which is somewhat smooth in their interior, but which on their external surface forms transparent woolly filaments, so closely interwoven that the outer surface of a flake shows no evidence of the cellular structure beneath. Each cell is the habitat of an insect,

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which when fully developed, escapes by boring a passage through the top of the cell to the outer air.

Lerp Manna.

The *Lerp Manna* has an odour resembling manna of the ash, a similar colour and the same clammy feeling to the touch; it has a saccharine taste, but does not dissolve in the mouth. It is not wholly soluble in cold water or in cold alcohol; boiled in water, it breaks down so as to form a turbid mucilaginous liquid, which is coloured intensely blue upon the addition of iodine. Like the Australian manna previously noticed, the Lerp manna has not at present any useful application.

Alhagi Manna.

4. *Alhagi Manna* has been sent to the Exhibition from India. It is a saccharine substance in small, loose, dry grains of a pale brown colour, mixed with both leaves and pods of *Alhagi* (? *Maurorum*, Tourn.). It therefore differs in appearance from the Syrian alhagi-manna, sent by Dr. Gaillardot, of Saida, to M. Léon Soubeiran, which the latter describes as compressed into loaves or cakes.

Cinchona Bark.

CINCHONA BARK.—Neither Peru, Bolivia, Ecuador, nor New Granada have contributed any series of the Cinchona barks which are produced in their forests. There is, however, a fine general collection exhibited by Messrs. Howard and Sons, of London, and illustrated by drawings of the plant as well as by healthy living specimens of *Cinchona succirubra*, Pav., *C. micrantha*, R. et P., *C. Uritusinga*, Pav., *C. nitida*, R. et P., and *C. peruviana*, Howard. Among the productions of the Dutch colonies are specimens of genuine Calisaya bark grown in Java, also of the bark of *C. Pahudiana*, Howard, a species of very little medicinal value.

Balsam of Copaiba.

BALSAM OF COPAIBA.—The specimen sent from Trinidad is interesting as being entirely produced by one species, namely, *Copaifera officinalis*, Jacq., a tree abundant on the south coast of the island. Balsam of Copaiba is not at present, I believe, an article of export from Trinidad.

SEEDS OF SCAPHIUM; BOA-TAM-PAIJANG.—In a recent number of the *Pharmaceutical Journal*,[1] I described and figured under

[1] July, 1861, p. 6.

1862.

Seeds of Scaphium.

the Chinese name *Ta-hai-tsze*, a drug which some years ago had an ephemeral reputation in Paris as a specific in diarrhœa and dysentery. From its resemblance to the fruits of certain species of *Erioglossum* and *Nephelium*, I conjectured it might belong to one of those genera, or at least to the Order *Sapindaceæ*. In May last, however, M. Decaisne requested me to examine whether it was not rather the *seed* of *Scaphium*, a genus of *Sterculiaceæ* in which the follicles inclosing the seeds are monospermous, very large and leaf-like, and open long before the seed attains maturity. The correctness of M. Decaisne's opinion was soon confirmed by specimens of *Scaphium scaphigerum*, Wall. contained in the herbarium of the Royal Gardens of Kew, and in that of the Linnean Society, and no doubt remained that the seed of that plant constitutes the drug called *Ta-hai-tsze* by the Chinese, and *Boa-tam-paijang* and *Bung-talai* by the Siamese. The French collection of products from Cochin-China includes a specimen of it, which in the catalogue is referred doubtfully to *Sterculia* (*Scaphium*) *scaphigera;* it is stated, though probably in error, to be used in dyeing. It is also sent to the Exhibition from Siam.

Behen Root.

Radix Behen.—This drug, which held an important place in the medical writings of the Arab school, and which thence came to be introduced into most of the Pharmacopœias of Europe up to the commencement of the last century, was recently the subject of an interesting communication to the *Journal de Pharmacie et de Chimie*[1] by Professor Guibourt, of Paris. There are two sorts of Behen, the *white* and the *red*, both of which have long been obsolete in Europe, though still found in the bazaars of the north-west of India, whence specimens have been sent to the Exhibition. White Behen is referred by all writers on Materia Medica to *Centaurea Behen*, L., a plant of Persia and traditionally also of the Lebanon. Red Behen is generally attributed to *Statice Limonium*, L., but the root of this plant, whether produced in Europe or in Asia, is so very different that I cannot suppose there is the least connection between it and the drug in question.

[1] Tome 31, p. 227.

1862

Amoma.

AMOMUM FRUITS.—The Exhibition contains the fruits of several species which are not without interest to the pharmacologist. Thus we find fruits of *Amomum Cardamomum*, L., and *A. xanthioides*, Wall., sent from Siam and Cochin-China; and fruits of *A. maximum*, Roxb., from India. From the French settlements on the Gaboon River, come specimens of the fruits of *Amomum citratum*, Pereira, a species of which we at present know very little, but which is remarkable for the agreeable lemon-like odour of its large angular seeds. The fruit of *A. Danielli*, Hook. f., a very variable plant, common all along the coast of Tropical Western Africa, is in one of the English collections, where we also find fruits of *A. latifolium*, Afz., which are striking from their large size. *A. latifolium*, a native of Sierra Leone, was described by Afzelius in 1813 in his *Remedia Guineensia*, published at Upsal, but it is a plant still almost unknown to botanists. There are specimens of two other fruits of *Amomum* from the Portuguese settlements on the west coast, which probably belong to undescribed species. Fruits of *Amomum Melegueta*, Rosc., the seeds of which constitute the Grains of Paradise of the shops, are sent from the West Indies, where the plant, which has been introduced from Western Africa, thrives as well as in its native jungles. Lastly, I may name as the most interesting of all, *Amomum Korarima*, Pereira, the fruits of which have for ages been known as the *Greater Cardamom* (*Cardamomum majus*), though the name is now misapplied to Grains of Paradise. The true *Cardamomum majus*, which is figured and described in several of the older works on Materia Medica, is still an object of traffic in the East, and, strung upon strings, may still be seen adorning the stalls in the drug bazaar of Damascus. In Abyssinia it answers the purpose of a small coin, and as such it figures in the collection exhibited by the International Decimal Association. The seeds of *A. Korarima* are an agreeable aromatic, in flavour much resembling the seeds of the common Elettaria Cardamom, and entirely devoid of the burning taste of Grains of Paradise. The plant for which the late Dr. Pereira proposed the name *Amomum Korarima* is entirely unknown; it is supposed to be a native of eastern

A. Korarima.

1862. Central Africa, whence its fruits are exported by way of Abyssinia and Massowah.

Statice latifolia.

Root of Statice latifolia, Sm.—Among the few drugs sent from Russia to the Exhibition, are specimens of the thick woody root of *Statice latifolia*, Sm. (*St. coriaria*, Pall.), which is remarkable for its compact substance and large size, so unlike what is usual in other species of *Statice;* this root I have recognized to be identical with that imported some years ago into Marseilles, and described by M. Guibourt in his *Histoire des Drogues*, tome 2, p. 416. With respect to its production and uses, I have been favoured with the following remarks by Mr. George Peterson, the Russian Commissioner of the Exhibition, who, as a member of the Scientific Committee for the Crown Lands of Russia, has the best opportunity for being correctly informed upon the subject. The "*Statice coriaria* of Pallas," says he, "grows wild in the whole prairie country of Southern Russia, known under the name of *steppes*, that is, land without forests. I have myself during two years travelled through this region, and seen roots of it of the length of more than thirty feet and with a top diameter of four and a half inches. The plant is also found in the north of the Crimea and in the southern part of Bessarabia, but in general it is more common in the eastern part of the prairie region near the Wolga, and to the east of this river. To dig out the roots is very difficult, because the subsoil is hard and cannot be worked with a pickaxe. The root penetrates the soil and subsoil in a nearly perpendicular line; the longest roots are discovered on steep river-banks, which are underwashed each spring-time by the swollen rivulets and also after heavy rains, the latter occurring very seldom. A small number of tanners have begun to employ the roots of *Statice*, but as the supply is precarious and the leather tanned with them brittle, no progress is made in utilizing this tanning material, which in more skilful hands has proved one of the best, as, for instance, in Spain." [*N. Repert. f. Pharm.* xi. 445.]

NOTE ON THE USE OF *BALSAM OF PERU* IN THE ROMAN CATHOLIC CHURCH.

(*Gebrauch des Perubalsams in der römischen Kirche.*)

1861.

In an interesting notice respecting the liquid commonly, though incorrectly, called *Balsam of Peru*, given some months ago in the *American Journal of Pharmacy*, the writer, Dr. Charles Dorat, pointed out that the balsam was at one time in such great esteem, that its employment was sanctioned by high ecclesiastical authority in the preparation of the Chrism used in the Roman Catholic Church. It appears, moreover, that there still exists among the archives of Guatemala, copies of bulls of Popes Pius IV. and Pius V., authorizing the clergy to make use of this balsam in the Holy Chrism, and pronouncing it sacrilege to destroy the trees producing it.

Dr. C. Dorat.

Thinking it would be interesting to ascertain with precision the terms of these ancient documents, I asked my friend, Signor Vincenzo Sanguinetti, Professor of Mineralogy at Rome, to make application in the proper quarter, and to obtain for me, if possible, copies of the bulls in question. Professor Sanguinetti was kind enough promptly to respond to my request, but he found that the records of bulls issued during the pontificate of Pius IV. have been lost, and that none can now be discovered in the archives of the Vatican. His search for the bull of Pius V. was, however, successful, and he forwarded me a copy, which, with a translation, I have given below. It will be observed that the bull allows the substitution of *Balsam of Peru* for *Mecca Balsam*, which latter, mixed with oil, constitutes the ordinary *Chrisma principale* of the Roman Catholic Church.[1]

Bull of Pius V.

[1] Vide Dr. Hook's *Church Dictionary*, Ed. 6, Lond., 1852, where *Chrism* is thus defined :—

"*Chrism*—Oil consecrated in the Romish and Greek churches by the bishop, and used in baptism, confirmation, orders, and extreme unction. This chrism is consecrated with great ceremony upon Holy Thursday. There are two sorts of it ; the one is a composition of oil and balsam, made use of in baptism, confirmation, and orders ; the other is only plain oil consecrated by the bishop, and used for catechumens and extreme unction. Chrism has been discontinued in the Church of England since the Reformation."

Consult also Hoffmann, *Lexicon Universale*, Lugd. Bat., 1698 (*in verbum*).

1861.

FACULTAS EPISCOPIS INDIARUM.

(*In confectione Sacri Chrismatis certo liquore seu succo in locum Balsami.*)

PIUS PAPA QUINTUS, *ad perpetuam rei memoriam.*

Facultas. Digna reddimur attentione solliciti illa ad exauditionis gratiam admittere vota, per quæ in necessitatibus in sacramentorum confectione occurrit, et consuli possit.

Preamble. §. 1 Expositum siquidem Nobis nuper fuit, quod in partibus Indiarum ubi antistites commorantur, non invenitur nec inveniri potest balsamus vel oleum ex balsamo ad conficiendum S. Chrisma necessarium; reperitur autem quidam liquor, seu succus mira odoris fragrantia, et ad lavanda vulnera ad modum conducens, qui communiter habetur pro vero balsamo, præstat enim effectus quos balsamum ab Alexandria allatum præstitisse perhibetur.

§ 2. Quare iidem partium Indiarum præsules Nobis humiliter supplicari fecerunt, ut in præmissis de aliquo opportuno remedio providere de benignitate apostolica dignaremur.

§ 3. Nos igitur necessitatibus hujusmodi consulere volentes, hujusmodi supplicationibus inclinati, tam Archiepiscopis quam Episcopis illarum partium, et pro tempore in ipsis partibus commoraturis antistitibus, ut de cetero perpetuis futuris temporibus in confectione S. Chrismatis dicto liquore seu succo in locum balsami, uti libere et licite possint, amplam licentiam et facultatem, apostolica auctoritate tenore præsentium concedimus, et desuper indulgemus ac dicto Sancto Chrismati cum dicto succo rite tamen confecto, tantam fidem adhibendam esse, ac si in illo balsamus intervenisset.

§ 4. Non obstantibus præmissis quibusvis apostolicis ac in Provincialibus et Synodalibus Conciliis editis generalibus vel specialibus constitutionibus et ordinationibus cæterisque contrariis quibuscumque.

Datum Romæ apud S. Petrum sub annulo Piscatoris die 2. Augusti 1571, Pontificatus nostri anno VI.

Translation.

1861.

A faculty granted to the Bishops of the Indies for the preparation of the Holy Chrism with a certain liquor or juice in the place of Balsam.

Pius V., Pope, for the perpetual commemoration of this matter.

We are rendered most anxious to admit to the favour of a careful hearing these prayers, worthy of attention, by which a case of necessity occurs in the preparation of sacred things, and how the same may be provided for.

1. Forasmuch as it hath lately been explained to us, that in those parts of the Indies where our prelates sojourn, there is not found, nor can be found, the balsam-tree or oil therefrom, necessary for the preparation of the Holy Chrism; but there is found a certain liquor or juice, of wonderfully fragrant odour and exceedingly efficacious for the cleansing of wounds, which liquor is commonly used instead of the true balsam, for it produces all the effects which the balsam brought from Alexandria is accounted to have produced.

2. Wherefore these same prelates of the parts of the Indies have caused us to be humbly supplicated, that under these premises we would, of our apostolic bounty, vouchsafe to provide some convenient remedy.

3. We, therefore, willing to provide against necessities of this kind, and moved by these prayers, do, of our apostolic authority, concede by the tenor of these presents, full licence and permission, as well to the archbishops as to the bishops of those parts, and, for the time being, to those prelates who may in future sojourn in those parts, that they may, in the preparation of the Holy Chrism freely and lawfully use the said liquor or juice in the place of balsam. And by a further indulgence we decree that the same efficacy shall be attributed to the said Holy Chrism if prepared aright with the said juice, as if balsam were an ingredient in it.

4. Any previous constitutions or ordinances whatever, whether

1861. apostolic, or given forth by provincial and synodal councils whether special or general, to the contrary notwithstanding.

Given at Rome, at St. Peter's under the Fisherman's ring, this 2nd day of August, 1571, in the 6th year of our Pontificate.[1]

ON THE MANUFACTURE OF *BALSAM OF PERU.*

(Gewinnung des Perubalsams.)

1863. Pereira's account confirmed.

It is now thirteen years since the late Dr. Pereira laid before the Pharmaceutical Society of Great Britain some account of the process by which the liquid known as *Balsam of Peru* is prepared in the State of Salvador in Central America, and at the same time described, so far as the imperfect materials at his disposal would allow, the tree from which the balsam is obtained. Subsequently to this, namely, in the year 1860, Dr. Charles Dorat, of Sonsonate in the State of Salvador, communicated to the *American Journal of Pharmacy* a notice of the manufacture of Balsam of Peru completely confirmatory of that given by Dr. Pereira, which account was published in the *Pharmaceutical Journal.*

The balsam-tree, which Pereira at first regarded as *Myroxylon pubescens*, HBK, was afterwards called by him provisionally (until materials for a complete botanical description should be obtained) the *Myrospermum of Sonsonate.* Upon the death of Pereira, the late Dr. Royle drew up in botanical terms a description of the tree, upon which he conferred the name of *Myrospermum Pereiræ*, which in 1857 was changed by Klotzsch of Berlin to *Myroxylon Pereiræ*, he maintaining the distinctness of the two genera *Myrospermum* and *Myroxylon.*[2]

Myroxylon Pereiræ.

The question of the origin of Balsam of Peru having been thus elucidated, there may seem little reason for again bringing it before the Society; but having received within the last fortnight, through the kindness of Dr. C. Dorat, somewhat ampler information upon certain points, accompanied by some excellent original sketches representing the collection of the balsam at Juisnagua, near Sonsonate, I think the subject sufficiently

[1] *N. Repert. f. Pharm.* x. 302.
[2] *Bonplandia*, 15 Sept. 1857, p. 274.

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interesting and important to deserve further attention. I am the more strongly of this opinion because I find that continental pharmacologists are by no means agreed as to the botanical origin and place of production of the balsam, or even as to the mode of its manufacture, one of the most recent writers describing it to be obtained by boiling the bark and branches or else by destructive distillation like tar; and two others naming four species of *Myroxylon* as being probably employed to yield it. Uncertainties.

Dr. Dorat, with whom I have interchanged letters occasionally for some years, and from whom I recently requested information upon certain points connected with the history of Balsam of Peru, thus replies to the inquiries contained in my last letter:— Dr. C. Dorat.

As I presume that you are writing a description of the balsam-tree, I send you by return steamer the required answers to your questions, together with a specimen of the naturally-exuded resin, and a few beetles which are invariably found under any part of the decayed bark of the *Myrospermum*.[1] That no possible mistake might exist on my part, I rode to Juisnagua, it being still the collecting season, and took a sketch of the process, which, with a verbal description, will, I trust make all clear to you.

Now to answer your questions: as to the *natural* or *spontaneous exudation*. In young trees, say, until the sixth or eighth year, I have never seen any. After that age a greenish resin is frequently found during the summer months on the northern side of the trees when they are at rest, that is from December to May. It is at first frothy and of a pale yellow colour, but as it becomes hard it changes to green. It occurs in small quantities and is difficult to get clean, as it is very sticky. It has a slightly bitter taste, but no aroma. The Indians consider that the trees which produce much of it yield an inferior balsam. This, however, is only one of their many superstitions concerning these trees. The largest quantity I have myself seen was upon a very old tree; it appeared in large tears lying one over the other, almost like grapes. Natural exudation.

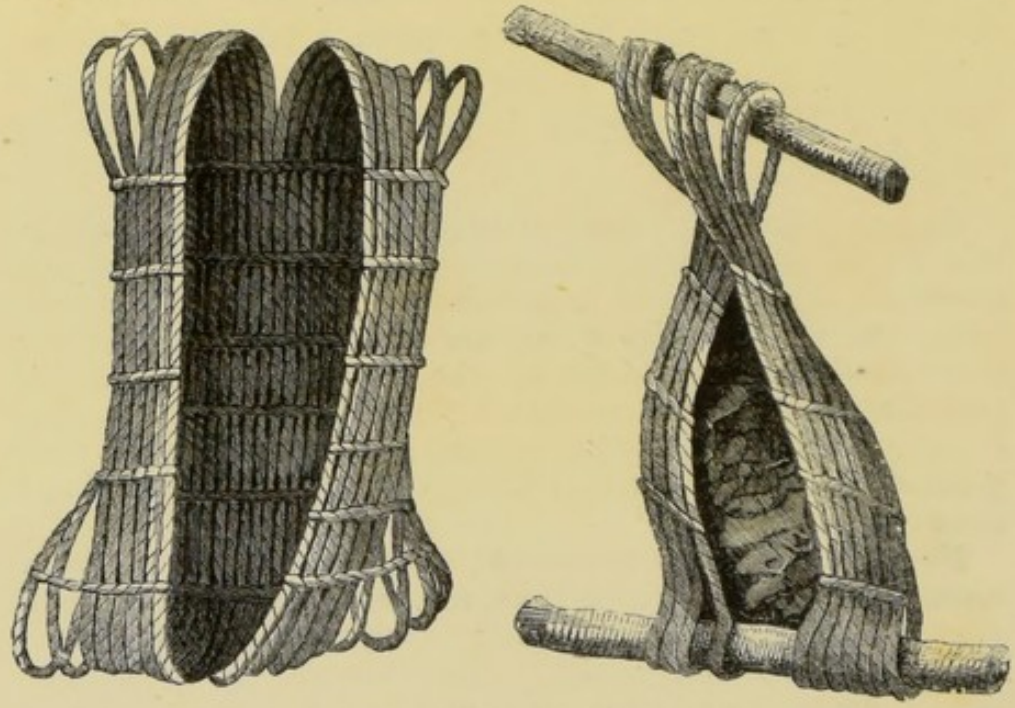
Early in the months of November or December, or after the last rains, the balsam-trees are beaten on four sides of their Collection.

[1] Mr. Francis Walker, who has been good enough to examine this insect, considers it identical with the *Passalus interstitialis* of Percheron.

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Collection of the Balsam.

stems with the back of an axe, a hammer, or other blunt instrument until the bark is loosened, four intermediate strips being left untouched that the tree may not be injured for the next year. Five or six days after, men with resinous torches, or bundles of lighted wood apply heat to the beaten bark, which becomes charred. It is left eight days, during which the burnt pieces of bark either fall or are taken off. As soon as they perceive that the bare places are moist with the exuding balsam, which takes place in a few days, pieces of rag (of any kind or colour) are placed so as entirely to cover the bare wood. As these become saturated with the balsam, which is of a light



Rope Bag used for pressing the Rags.

yellowish colour they are collected and thrown into an earthenware boiler, three-quarters filled with water, and stirred and boiled gently until the rags appear nearly clean, and the now dark and heavy balsam sinks to the bottom. Fresh rags belonging to the same owner are continually being put into the boiler until sun-down, when the fire is extinguished; when cold the water in the boiler is poured off, and the impure balsam set aside. During this process the rags that appear to have been cleared of balsam are taken out of the boiler at different times and given to a man to be pressed, by which means much balsam is still obtained. The press consists of a small open bag about fourteen inches long, made of stout rope fixed together with

1863.

twine, open at the middle and looped at both ends to receive two sticks. The rags are placed inside, and the whole is twisted round by means of the sticks and the balsam squeezed out. A washerwoman wringing out a wet cloth fairly represents the process. The balsam thus procured is added to that in the boiler. The next day, the cold balsam is weighed and put into *tecomates*, or gourds, of different sizes and sent to market—its price at present is five reals per pound. If it is wished to purify it, the boiler is left standing for several days, when the impurities float to the surface and are skimmed off. A little water is also left to float at the mouth of the tecomate when brought for sale.

Manipulation.



Gourds, or *Tecomates*.—One covered with plantain leaves.

These tecomates are tied up in plantain leaves, with a stopper of the same.

A very fine quality of balsam is collected from the broken pods in the same manner as above.[1] It requires more trouble and care to collect, and there being no demand for it, it is scarcely ever met with. I believe it is known as *Balsamo blanco*. From the flowers there is distilled a most delicious and fragrant *oguardiente*, far superior to any brandy.

Balsamo blanco.

A healthy tree will produce balsam well for about thirty years, after which, if allowed to remain untouched for five or six years, it will again produce. The collecting begins shortly after the last rains, that is, some time in November, and is supposed to be finished in May. During the rains none is

[1] It is more probably made by simple expression, and not by boiling.—D. H.

1863. collected. In the dog-days, that is from the 15th July to the 15th August, there being scarcely any rain here, a small quantity is collected by a few enterprising Indians.

The beating and application of rags is only made during four days of each week, that is four *cosechas* (harvests) per month. Should the flow of resin decrease, fresh heating and rags are applied, and after eight days the boiling is resumed, and so on as long as the dry season permits. It was formerly the practice to apply fire to cuts made in the bark and to allow the exuding resin to burn for a short time: now after a good beating the bark is only heated by torches or burning wood.



Ancient Tributary Balsam Jar.

I believe I mentioned to you that before the conquest and for a short time after, balsam formed a part of the tribute paid to the chiefs of Cuscatlan, the chief department of the State (now S. Salvador), and was brought from the coast in earthenware jars representing the *pajuil* or Mexican pheasant (*Crax globicera*). Many of these old jars are now found in the mounds and excavations of the ancient *pueblos* on the coast. I send you a copy of a broken one in the possession of our worthy Bishop. It is one-fourth the original size. The *pajuil* feeds on the young nuts, and is found in great numbers on these trees during the season.

Tributary Jars.

The small *pueblos* scattered over the so-called *Balsam Coast* are numerous. The principal ones are :—

Pueblos on the Balsam coast.

JUISNAGUA, a moderate-sized pueblo, about six leagues from Sonsonate, formerly rich in cacao but at present of small account. It is the first town where balsam is produced; there are in the vicinity about 400 balsam-trees.

Tepecoyo or Coyo.

TEPECOYO, OR COYO (Indian *Mount of Wolves*), on an elevated ridge, the valleys on either side being well watered, is situated twelve leagues south-east of Sonsonate. About a league south of the town there is a gold mine, which was opened in 1832, and the ore sold in Guatemala. Owing to the depravity of the Spanish miners, the Indians rose against the owner and expelled him, since which they will not allow any one even to visit it. The produce of this pueblo in balsam is small, having been last year only six arobas of twenty-five pounds.

Tamanique.

TAMANIQUE, situated in a circular valley, surrounded by very high and heavily-timbered mountains, among which are numerous tigers, wild hogs, lions (puma), and four-fingered green monkeys. Vanilla is plentiful, but not of the finest quality. There are at present worked 1400 balsam-trees, producing about 160 arobas yearly. In the vicinity are 1500 cacao-trees of fine quality, producing seventy arobas of cacao-beans. The Indians are a drunken and superstitious race.

Chiltiuapan.

CHILTIUAPAN, near the sea, on an elevated and extensive plateau, between two rivers, the Sonto and the Sonsapuapa, running to the sea with fine fish, and numerous caymans. The dense forest surrounding this pretty pueblo contains 2569 balsam-trees, producing 450 arobas of balsam, value about $3500. The next article of value is cacao, of which there are 1700 trees, value of produce this year $830. The Indians of this pueblo are honest and very industrious, as besides the balsam and cacao they have now coffee plantations, and grow much Indian corn. The dress of the women consists only of a small petticoat, crimson with a black stripe. They speak the Nahuat idiom.

Talnique.

TALNIQUE, at the foot of the Cerro del Tamagas, or Snake-hill, situated on a most extensive and fertile plain, six leagues from Sonsonate, south-east. There are not above 500 balsam-trees about this pueblo. It is more noted for its fine qualities of timber, vanilla and cacao. It is from this vicinity that the best *mora* (fustic) is obtained, and also the finest grained rosewood (Grenadilla). The streams, of which there are several, abound in leeches, which are sold in Sonsonate at four reals each. The Indians being in constant communication with Sonsonate are a

1863. vicious and lazy race. As in most of these pueblos, the wild animals commit great ravages among the cattle.

Jicalapa. JICALAPA, situated on a small plain, about three leagues from the beach, intersected by deep gulleys (*barrancas*), heavily wooded, principally with large cedars. The Indians are an idle race, and only cultivate about 1200 balsam-trees although many more exist in the dense woods, which remain uncleared. The heat is very great, and the climate most unhealthy. Maize is mostly cultivated, and plantains are numerous. The animals are tigers, pumas, warris, ant-eaters (two varieties), armadilloes and large black monkeys which form a great portion of Indian delicacies.

Teotepeque. TEOTEPEQUE, a small pueblo, situated on a beautiful eminence sixteen leagues from Sonsonate and one league from the sea. The climate is very hot, often 105° F. in the shade, but from its elevation very healthy. The men wear a scanty breech cloth, and the women only an apology for a petticoat. They are the most debased of all the Indians of the coast, plant a little corn and live principally on fish and every kind of animal, including their favourite dish the iguana. There are plenty of balsam-trees on the slopes of the mountains, but not above 300 are worked. They sell their balsam to the neighbouring pueblos in exchange for *manta*. The hills also produce sarsaparilla, and several gums, incense, &c.

Comasagua. COMASAGUA.—This town, although producing a little balsam does not belong really to the balsam coast, being nearer San Vicente. There are about 1000 trees, but their cultivation has been nearly abandoned for that of coffee, the climate being cool and appropriate to that plant. The balsam is sold in San Salvador. They have vanilla, maize, wheat, rice, potatoes, peaches, and a variety of fruit to supply the market of San Salvador. The inhabitants are mostly Ladinos, very steady, brave, and industrious. The dress of the women changes here to red and blue checkered.

Jayaque. JAYAQUE.—This town, which from records has existed for 260 years, is situated on the fertile declivity of a mountain called La Cumbre, a few leagues from Izalco, and near the hot river Cachal. There are about 1000 balsam trees under cultivation. Sugar, however, is the principal branch of industry, value this year in *panela* or moist sugar $4000. The forests abound in fine woods, mahogany, cedar, rosewood, fustic and laurel,

copalchi and a few quina trees, with sarsaparilla. About the year 1780, this town, then very large, was nearly destroyed by a flood of liquid mud, that issued suddenly from a small hill opposite; a great portion of the inhabitants fled to the upper lands, and settled the present pueblo of Ateos, on the main road to San Salvador. The whole of these lands are volcanic, and form part of the volcanic group of Santa Ana and Izalco. 1863.

These are the principal towns trading in balsam; there are, however, many small villages and *chacras*, or farms, having trees and working them, with whose names I have not become acquainted. The Indian name of the balsam is *Hōō shi-it*, or *Oō shēēt;* in Spanish it is called *Balsamo negro.*

The drawings I inclose you are first, a sketch of the process of extracting the balsam; second, a *Tecomate* with its covering, and the open bag used as a press; third, sketch of a tribute jar representing the *pajuil.*

In addition to the sketches here referred to, and which are produced in the woodcuts of this paper, Dr. Dorat has favoured me with specimens of the balsam-tree, *Myroxylon Pereiræ*, Kl.; and as I have also received it from three other independent collectors, I do not feel the least hesitation in regarding it as the source of the whole of the Balsam of Peru of commerce. Dr. Dorat is himself of this opinion; and the late Mr. Sutton Hayes, who was an excellent botanical observer, and who gathered specimens of the tree at Cuisnagua and in other places, assured me that so far as he knew, no other species of *Myroxylon* occurs on the balsam coast or in Guatemala. Specimens of the Balsam tree.

Although there is some evidence to show that the balsamic exudations of one or two other species of *Myroxylon* or *Myrospermum* were formerly collected in other parts of tropical America and sent to Europe as Balsam of Peru, it is hardly on that account the less certain that for nearly three centuries the great bulk of the drug imported has had the same origin as that of the present day. At the period of the Spanish conquest the balsam was an important production of the very region where it is still obtained, as is evidenced by its forming part of the tribute carried by the aborigines of the coast to the chiefs in the interior. It appears, moreover, that the estimation in which it was held by the Indians was soon shared by their invaders; Importation of the Balsam.

1863.

for in consequence of the representations of missionary ecclesiastics, Pope Pius V. was induced to issue a bull under date 1571, authorizing the use of the balsam produced in the country for the preparation of the Holy Chrism of the Roman Catholic Church. A copy of this curious document is preserved among the archives of Guatemala (of which state Salvador was formerly a part), as well as in the Vatican at Rome.[1] As to the balsam having acquired the name of Peru, a country so remote from its place of production, the circumstance is intelligible when we know that during the early period of the Spanish dominion, the productions of Central America were shipped to Callao, the port of Lima, the capital of Peru, and great emporium of its trade, and thence transmitted to Spain. From this cause the drug acquired the name of the country from which it was shipped to Europe, exactly in the same manner as *Turkey* gum arabic, *Turkey* myrrh, *East India* rhubarb, *Bombay* senna, etc. have acquired and still bear designations very little indicative of their real origin. In proof of this I may quote an interesting passage occurring in De la Martinière's *Dictionnaire Géographique* (Paris, 1768), where under the head *Callao*, the author enumerating its imports, mentions as coming from Sonsonate, Realejo and Guatemala, the *Balsam which bears the name of Peru*, but which, says he, *comes in reality almost entirely from Guatemala*. He adds that there are two kinds of it, the *white* and the *brown*, the latter being the more esteemed.[2]

Origin of the name.

Names of drugs derived from place of shipment.

Alcedo, author of a Geographical Dictionary published at Madrid in 1786-9, writing of Sonsonate, observes that it includes

[1] *Vide* also *Pharm. Journ. and Trans.* vol. ii. (1861) p. 446.

[2] " . . . Dans la même rue du côté du nord sont les magasins des marchandises que les vaisseaux Espagnols apportent du Chili, du Pérou et du Mexique.

Du Chili viennent les cordages, les cuirs, les suifs . . .

Du Mexique, comme de *Sonsonate*, *Realejo*, *Guatemala*, de la bray et du gaudron qui n'est bon que pour le bois, parce qu'il brûle les cordages ; des bois pour les teintures, du souffre et du baume qui porte le nom de Pérou, mais qui vient effectivement presque tout de Guatemala. Il y en a de deux sortes, de blanc et de brun ; ce dernier est plus estimé, on le met dans des cocos quand il a la consistance de la bray, mais communément il vient dans des pots de terre en liqueur, alors il est sujet à être falsifié, et mêlé d'huile pour en augmenter la quantité."—De la Martinière, *Dictionnaire Géographique* (Paris, 1768, fol.), Tome 2, p. 48.

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in its jurisdiction the celebrated *Balsam Coast*, where is produced the richest balsam, which in all parts is held in particular estimation.[1] He further mentions that the only commercial port is Acajutla, four leagues from the capital, and that it is frequented by vessels from New Spain, Terra Firma and Peru.

Juarros, in his *History of Guatemala*, describing the province of S. Salvador, remarks that its natural productions are in general similar to those of the other provinces on the southern coast, but that the balsam-tree is found exclusively in that province, upon what is called the *Balsam Coast*, which extends from the port of Acajutla to the Bay of Jiquilisco.[2]

The Balsam Coast.

Baily, a recent author, whose work entitled *Central America* appeared in 1850, remarks that the balsam was long erroneously supposed to be a production of South America, for in the early period of Spanish dominion it was usually shipped to Callao, in Peru, whence it was sent to Europe, where it received the name of *Balsam of Peru*, being deemed indigenous to that country.

Old methods of preparation.

The old method of preparing the balsam does not appear to have been that resorted to at the present day, for Dr. Dorat has stated that the Spaniards were in the habit of obtaining it by cutting down the trees and boiling the wood,—a wasteful and destructive practice which was afterwards prohibited. Whether the process now followed was also in vogue, or how and when it was introduced, is not evident; the extraction of the balsam by boiling chips of the trunk and branches is, however, described by most writers on Materia Medica. Monardes, whose account is the earliest, asserts that the balsam extracted in this manner is collected with shells from the surface of the water, a statement difficult to believe, as the balsam of modern times, has, a sp. gr. of 1·150 to 1·160. But I find that even this is capable of some explanation; for upon saturating some cotton cloth in Balsam of Peru and then boiling it in water, I was able with a spoon to

Monardes.

[1] "Comprehende en su jurisdiccion la celebrada Costa del Bálsamo, de donde se saca el mas rico que se conoce, y tiene particular estimacion en todas partes."—*Diccionario Geográfico-Historico de las Indias Occidentales ó América*, tomo iv. (1788) p. 577.

[2] Having been unable to consult the original work, I have quoted Baily's translation, London, 1823.

1863. collect *floating on the surface*, nearly the whole of the balsam taken. Monardes says, however, that the balsam was thus removed *after the cooling of the water*, an assertion which seems improbable, since *most* of the balsam, if heavier than water, sinks upon cooling.

How far the balsam obtained by boiling the wood agreed in properties with that procured after charring the bark, as is done at present, it is not easy to say. It was certainly a dark fragrant liquid, which when as thick as pitch was sometimes inclosed in little calabashes,[1] such, I presume, as may still be found in a few old collections of Materia Medica. Some of this which I have examined is a soft solid resin, sinking rapidly in water, but rising to the surface when the water is made to boil. What the *white* balsam mentioned by De La Martinière was derived from, I know not: possibly it was the resin of liquidambar which is still a product of the country,—possibly (though I do not think it likely) the resin from the pods of the balsam-tree.

White balsam.

Another point of considerable interest brought to light by Dr. Dorat's communication is that the resin (or more properly, as it proves, *gum-resin*) naturally exuded from the balsam-tree is entirely devoid of balsamic odour and taste. As my friend Dr. Attfield has kindly undertaken a few experiments upon this substance, I shall not here enter into further particulars respecting it, except to remark that its total dissimilarity from Balsam of Tolu disproves the statement of those writers who have maintained that that drug is the concrete balsam of the tree which yields Balsam of Peru.

Professor Attfield.

ADDITIONAL NOTE ON THE MANUFACTURE OF BALSAM OF PERU.

1864. In my paper on Balsam of Peru I endeavoured to show

1. That that drug has been always a production of Guatemala, or rather of that part of it which is now called Salvador.

2. That the tree which yields it is the *Myroxylon Pereiræ* of Klotzsch.

[1] De la Martinière, l.c.

3. That it acquired the name of *Balsam of Peru* solely from the circumstance of it being transported to Europe by way of Peru. 1864.

Since communicating to the Society that paper, I have referred to several of the early writers on Central America, in the hope of finding further confirmation of the opinions above expressed. In this I have not been wholly unsuccessful, as the following brief extracts will show.

Father Joseph de Acosta.

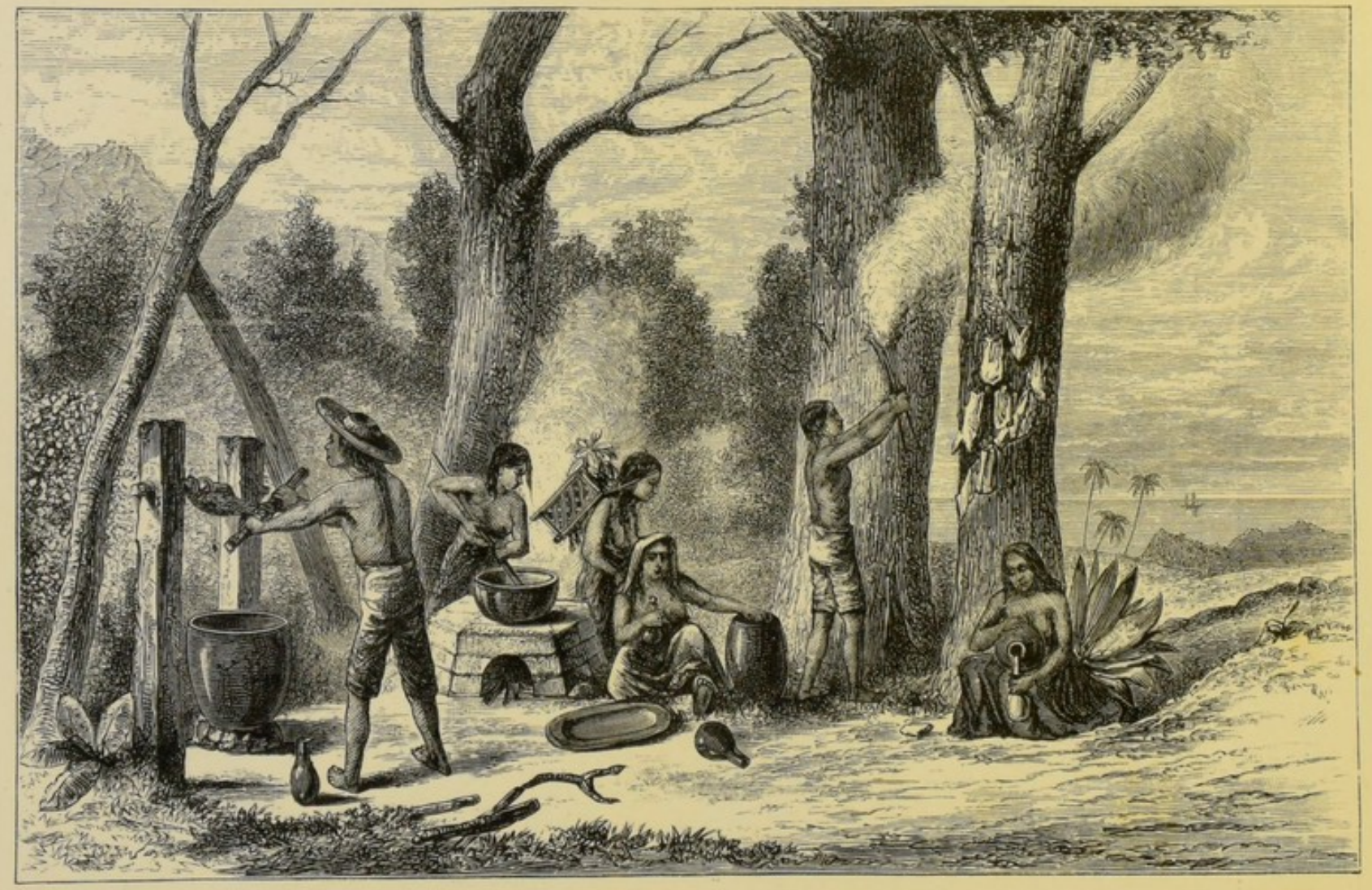
Father Joseph de Acosta in his *Historia Natural y Moral de las Indias*, published at Seville in 1590, says:— " . . . . That which is more important, is, that for making the Chrism, which is so necessary in the Holy Church and so greatly venerated, the Apostolic See has declared that with this Indian balsam Chrism is to be made in the Indies, and with it that of the Sacrament of Confirmation, and those moreover used in other ceremonies of the Church.

" Balsam is brought to Spain from New Spain; and it is in the provinces of Guatemala and Chiapas and others in those parts that it most abounds, although the most precious is that which comes from the island of Tolu in Terra Firma, not far from Carthagena." [1]

Herrera's account of Guatemala.

Herrera, who wrote a history of the West Indies published at Madrid in 1601, states, in describing Guatemala, that " there are found in this province many fountains and springs of hot water having different properties, virtues and colours: there is fine balsam in abundance, which the Spaniards knew without learning it from the Indians, notwithstanding what a certain author has written. Moreover there is liquidambar, copal and suchicopal and other kinds of gums and juices, very perfect. . . . The harbour of Acaxutla near Trinity [Sonsonate] at 13 degrees

[1] " . . . . Lo que mas importa es, que para la substancia de hazer Chrisma, que tan necessario es en la sancta Iglesia, y de tanta veneracion, ha declarado la Sede Apostolica, que con este Balsamo de Indias se haga Chrisma en Indias, y con el se de el Sacramento de Confirmacion, y los de mas, donde la Iglesia lo usa. Traese a España el Balsamo de la nueva España, y la provincia de Guatimala, y de Chiapa, y otras por alli es donde mas abunda, aunque el mas preciado es, el que viene de la Isla de Tolu, que es en Tierrafirme no lexos de Cartagena."—lib. iv. c. 28.



A B C D E F G H

EXTRACTING THE BALSAMO NEGRO.

A Press made of rope—the rags are placed inside, and twisted by hand.
B Pressing out the remaining Balsam from the rags after boiling.
C Boiling the saturated rags.
D E Women waiting to fill the "Tecomates" or gourds.
F Heating or burning the bark, after it has been loosened by beating.
G Tree with rags stuck on the bare parts to absorb the Balsam.
H Woman filling a Tecomate.

1864.

of latitude, is the principal port of the province for going to New Spain and Peru." [1]

De Laet's account.

The following passage from De Laet's *Novus Orbis seu Descriptio Indiæ Occidentalis*, a work held in deserved esteem, is of peculiar interest as proving that the custom of charring the trunks of the balsam-trees was pursued by the Indians in early times, while the Spaniards had their own method of collecting the balsam. It occurs in the chapter headed "*San Salvador, San Miguel, Chuluteca—specialis descriptio harum provinciarum et eorum quæ habent peculiaria*," and may be thus rendered:—

"On the borders of the district of Guaymoco, grow many trees which afford balsam: and the entire coast, which is called *Tonala*, produces trees, the timber of which is exceedingly compact and heavy, and of which in a certain temple there are columns fifty feet in height. In the summer the natives collect the juice of the balsam-tree, after slightly burning the bark of the stem; but the Spaniards allow it to exude by itself: the tree bears fruit like almonds, which contain a golden-coloured juice." [2]

Dr. C. Dorat's sketch.

The opposite woodcut, taken from a coloured sketch made upon the spot by Dr. Dorat, represents the collection of the balsam at Juisnagua near Sonsonate.

[1] "On trouve en ceste province plusieurs fontaines et sources d'eaux chaudes ayant diverses proprietés, vertus, et couleurs: il y a du bausme, beau et beaucoup, que les Espagnols cognurent sans l'apprendre des Indiens, contre ce qu'en auteur en escrit. Plus il y a de l'ambre liquide, la gomme anime, copal et suchicopal, et autres sortes des gommes et liqueurs très-parfaits . . . . . Le havre Acaxutla, près de la Trinité à 13 degrés de haulteur, est le principal port de la province, pour aller en Neuf Espagne, et en Peru."—*Description des Indes Occidentales, traduit de l'Espagnol*, Amst. 1622, cap. xii. I have also consulted the Spanish edition published at Madrid, 1601-15.

[2] "In finibus Guaymoco pagi, plurimæ nascuntur arbores, quæ Balsamum edunt; universaque ora, quam *Tonalam* vocant, nutrit arbores admodum firma atque ponderosa materie, e qua in quodam templo reperiuntur columnæ quinquaginta pedes altæ. Indigenæ liquorem Balsami colligunt æstate cortice trunci leviter adusto; Hispani autem per se emanare sinunt: fert arbor illa fructus amygdalis similes, quibus inest succus aurei coloris."—*Novus Orbis seu Descriptio Indiæ Occidentalis*, Libri xviii., auctore Joanne de Laet, Lugd. Batav. 1633, lib. vii. c. 11.

ON *CORTEX WINTERANUS*.[1]

1862.

I HAVE read with much interest in the first number of this volume of the *Neues Repertorium*, the communication of Dr. Henkel on genuine *Cortex Winteranus*, and I beg leave herewith to submit some remarks on the same subject, the rather, as I perceive in that paper that the commercial article which is used instead of this drug in the German market is identical with what is found amongst our English druggists.

Dr. Henkel.

The observation of Henkel that an important difference exists between the bark of the *Drimys Winteri*, and the bark commonly used as *Cortex Winteri* in the market, finds complete confirmation in my own experience.

I have examined many fine stems of Drimys which were collected by Captain King in 1832 in the Straits of Magellan, and which are now in the collection of the British Museum, as well as samples of the same drug which were collected by M. de Guillot, likewise in the Straits of Magellan.

Specimens of Drimys.

Moreover I had an opportunity of being able to compare the Winter's-bark of Chili, New Granada, Venezuela and Mexico—and in addition, samples of bark from the cabinet of the Royal College of Physicians in London, and from the collection of Sir Hans Sloane in the British Museum; and in all cases have I with the naked eye (I was unable to examine them all microscopically) found decided characters nearly corresponding with those specified by Henkel.

Comparison of specimens.

It is certain that no Winter's-bark from the Straits of Magellan is now used by us; whilst no commercial relations exist between these remote parts of the earth and Europe.

Drimys Winteri, Forst., is, however, widely distributed, for according to J. D. Hooker (*Flora Antartica*, part ii., p. 229), on whose opinion I lay great weight in questions of this nature, the species known as *Drimys chilensis*, D.C., *Drimys granatensis*, Linn., fil. and *Drimys Mexicana*, D.C. are only forms of one and the same plant. We also know for certainty, that Winter's-

[1] Translated from the original paper in the *Neues Repertorium für Pharmacie*, Band xi., Heft 6, p. 241.

1862.

bark is not collected in the Straits of Magellan; that the same is collected, on the contrary, and moreover is in use, in Chili where it is known as *Canelo*, as also in New Granada and Mexico. *Canelo.*

From these countries, specially from New Granada, it comes occasionally to Europe, and I have more than once seen this bark in London, where it is bought at a very low price under the name of Pepper-bark, its origin being unknown.

With reference to the ordinary bark of commerce, I am of opinion with Henkel, that this name is by no means properly selected. On the contrary, I do not consider it the bark of any Canella, much less still of *Canella alba*, Murr., which last also is very sufficiently distinguished by the chemical behaviour of its decoction (as Henkel himself points out). Commercial Winter's-bark.

The true source of this bark has puzzled all pharmacologists who were convinced of its difference from Drimys; and the uncertainty was the greater as the spot where this bark, which has ceased to be an imported article, occurs, for a long time remained unknown. Doubts respecting origin.

In consequence of the Paris Industrial Exhibition, and of the importation of numerous colonial products thereby induced, reliable data were obtained which definitely settled these questions. The Winter's-bark of commerce comes from *Cinnamodendron corticosum*, Miers. (*Annals and Magazine of Natural History*, May, 1858, Grisebach, *Flora of the British West Indian Islands*, vol. i. p. 109), a tree growing in Jamaica, of the family Canellaceæ. This tree, which attains a height of 40 to 50 feet, is known on that island as Wild Cinnamon, a name which there is also given to *Canella alba*, and hence is well cleared up in part the confusion that has so long prevailed in this matter. Should we want a chemical proof in order to separate the Cinnamodendron from the Drimys bark, we use for the purpose the Tincture of Iodine, which, in the decoction of the Cinnamodendron bark, gives a black, in the Drimys, on the other hand, a brown precipitate. *Cinnamodendron corticosum.* Test by Iodine Tincture.

Dr. Henkel's third conclusion, that though perhaps *Cortex Canellæ albæ* may not be identical with the *Cortex Winter-*

1862. *anus* of commerce, yet from its agreement in structure the latter may still be a species of *Canella*, appears to give room to a doubt whether generally *Cortex Canellæ albæ* may be legitimately attributed to *Canella alba*, Murr. This doubt I cannot share with Henkel, for I have received specimens of barks of *Canella alba* from the Bahamas and Jamaica, which show convincingly that the common opinion maintained amongst pharmacologists on this point is well founded.

NOTE ON THE ORDEAL BEAN OF CALABAR.

(*Physostigma Venenosum*, Balf.)

1863. THE recent experiments of Drs. Argyll Robertson, Fraser, Stewart, Messrs. Bowman, Wells, and others on the Ordeal Bean of Calabar,[1] and the fact elicited by these experiments, that it possesses the peculiar power of causing the sphincter pupillæ and ciliary muscle to contract, render it probable that this remarkable seed will find a useful application in ophthalmic medicine; and the present moment is therefore appropriate for reviewing some of the facts hitherto ascertained respecting it.

Dr. Christison's researches.

The first important notice on the subject is contained in a most interesting and valuable paper by Dr. Christison, read before the Royal Society of Edinburgh, 5th February 1855. In this paper the author, after alluding to various vegetable substances used by the natives of tropical Western Africa in ordeal by poison, describes as one of pre-eminent virulence, a large leguminous seed called *Eséré* used by the negroes of Old Calabar in the Gulf of Guinea. This seed, which Dr. Christison called the *Ordeal Bean of Old Calabar*, and the botanical origin of which was at that time unknown, was the subject of some remarkable toxicological experiments which amply proved it to possess powers of no ordinary character. Dr. Christison also made some experiments on the seed with the view of isolating its active proximate principle, but was unsuccessful, partly owing, it is probable, to the limited amount of material at his disposal.

Eséré.

[1] *Edinburgh Medical Journ.*, March 1863; *Medical Times and Gazette*, May 16, 1863.

1863.

"All I can say," he observes, "is that the seed, like others of its natural order, contains much inert starch and legumin, and 1·3 per cent. of fixed oil, also probably inert; that its active properties may be concentrated in an alcoholic extract, which constitutes 2·7 per cent. of the seed; and that this extract does not yield a vegetable alkaloid by the more simple of the ordinary methods of analysis."[1]

Germination of Ordeal Beans.

Some of the Ordeal Beans in Dr. Christison's possession having been placed in earth, germinated in the Botanic Garden of Edinburgh, and in the garden of Professor Syme, producing vigorous plants; but as these did not flower, no determination of the genus to which the plant belonged could be made. At length, about the year 1859, the Rev. W. C. Thomson, of Old Calabar, a good botanical observer, was so fortunate as to obtain after many trials complete and excellent specimens of the plant, some of which, preserved in fluid, were communicated to Mr. Andrew Murray and Professor Balfour. Their examination devolved chiefly on the latter gentleman, who on the 16th January, 1860, read before the Royal Society of Edinburgh a *Description of the Plant which Produces the Ordeal Bean of Calabar* which, illustrated by two plates, was subsequently published in the Society's *Transactions*.[2]

Plant producing the Ordeal Bean.

The Ordeal Bean belongs to the natural order *Leguminosæ*, the sub-order *Papilionaceæ* and tribe *Phaseoleæ;* but subordinate to this, its characters have been considered sufficiently peculiar to warrant the formation of a special genus for its reception. This has accordingly been done, the new genus receiving from Dr. Balfour the name of *Physostigma*,[3] and the one species which it contains that of *venenosum*.

Physostigma venenosum.

[1] *Pharm. Journ.*, vol. xiv. (1855), p. 472.

[2] Vol. xxii. p. 305.

[3] From *φυσάειν to inflate*, and *στίγμα*. The genus is thus defined.—Calyx campanulatus, apice quadrifidus, laciniis brevibus, lacinia suprema bifida. Corolla crescentiformis, papilionacea; vexillum recurvum, apice bilobatum, basi angustatum, margine utroque auriculatum, membranâ inflexâ auctum, medio longitudinaliter bicallosum; alæ obovato-oblongæ, liberæ, supra carinam conniventes, versus basin appendiculatæ. Discus vaginifer. Ovarium stipitatum, 2-3-ovulatum. Stylus cum carina tortus, infra stigma subtus barbatus; stigma obtusum, cucullo cavo oblique tectum. Legumen dehiscens, oligospermum, elliptico-oblongum, subcompressum, extus

1863.

Genus *Physostigma.*

The most remarkable character of the genus *Physostigma* is that derived from the stigma, which possesses a singular, crescent-shaped, hooded appendage. By this character, and the long grooved hilum of the seed, it is separated from the nearly allied genus *Phaseolus;* and from *Mucura,* to which its seed bears considerable resemblance, by the characters of its flowers and pod; from *Canavalia,* by its diadelphous stamens and other characters; and from *Lablab,* by its phaseoloid carina and pistil.

Botanical characters.

Physostigma venenosum, the Ordeal Bean, is a large climbing perennial with a woody stem of two inches diameter and sometimes fifty feet in length. Its large leaves are pinnately trifoliate, with ovate acuminate leaflets. Its papilionaceous flowers are in pendulous racemes, the stalk or rachis of which is covered with tuber-like knots; each flower is about an inch in length and of a pale-pink or purplish colour, beautifully veined. The legume when full-grown is about seven inches in length, elliptico-oblong, with a short curved point stipitate, dehiscent and containing two or three seeds. The seeds, which are oblong or somewhat reniform, are from 1 to $1\frac{3}{8}$ inch in length by about $\frac{3}{4}$ of an inch in breadth; their convex edge marked by a long sulcate hilum, extending as a deep furrow from one extremity of the seed to beyond the other. The exterior of the seed is somewhat rough with a dull polish; its colour is a deep chocolate-brown, somewhat lighter on the raised edges of the furrow. The seeds weigh, on an average of twenty, 67 grains.

The Seeds Royal property.

The Ordeal Bean is difficult to obtain even near the localities where it is produced. Dr. Christison states upon the authority of the Rev. H. M. Waddell, of Old Calabar, that "the plant is everywhere destroyed by order of the king, except when it is preserved for supplying the wants of justice,—and that the only store of seeds is in the king's custody." Whether this remains to be the fact I know not; but Mr. Gustav Mann, Collector to the Royal Gardens, Kew, to whom I wrote some time ago

rugosum, endocarpium intus telâ laxâ cellulari tectum, isthmis cellulosis inter semina. Semina strophiolata, hemisphærico-oblonga, hilo latesulcato semicincta.

Herbæ suffruticosæ volubiles in Africa occidentali tropica crescentes: foliis pinnatim-trifoliolatis, stipellatis, floribus nodoso-racemosis, purpureis.

requesting a supply of the beans, remarked in a letter under date Nov. 24th, 1861, that he had been able to procure but few, "as the people did not like to give them to Europeans." There is no reason, however, to suppose that this reluctance will continue if a good money-value become attached to them. 1863.

Mode of Employment.

The best form in which to employ the Ordeal Bean as a medicine is a point of importance to the pharmacist, but one upon which further experience is required. Dr. Christison found that the active matter of the bean could be separated by alcohol, and he obtained (as already stated) 2·7 per cent. of extract by this menstruum. I found that upon reducing the bean to a coarse powder and exhausting it with cold alcohol (sp. gr. ·838), 2·3 per cent. of dry extract was obtained; and upon further exhausting the residue with similar alcohol at a boiling temperature, a further product of extract amounting to 2·2 per cent. Whether these extracts are alike in power is at present hardly proved, but the result of a single experiment appears to show that the second is as powerful as the first. The alcoholic extract rubbed down with water, forms a turbid liquid which, however efficient, is certainly not an elegant preparation, and it has been said rapidly to spoil. It has been prepared of several strengths, so that one minim may represent, $\frac{1}{2}$, 1, 2, or 4 grains of the bean. In glycerine, the alcoholic extract dissolves freely, yielding a tolerably clear solution; and if this menstruum be unobjectionable as an application to the eye, it will certainly prove convenient pharmaceutically, as it affords a solution not liable to change by keeping.

Alcoholic extract.

Glycerine solution.

The residue of the bean, after the extract had been obtained as above described, was dried; and with the view of ascertaining whether it still contained a poisonous principle, some of it, mixed with bread and lard, was administered to a mouse and rat. Neither animal would eat the mixture very readily; the mouse after some hours ate a pellet containing five grains of the residue and died in the course of the next day. To the rat, which at intervals ate a much larger quantity, the residue also proved fatal in about forty hours. These experiments show that the bean had not been entirely deprived of its active properties. [*N. Repert. f. Pharm.*, xii., 289.]

ON THE BEST METHODS OF APPLYING THE CALABAR BEAN IN OPHTHALMIC MEDICINE.

(Calabarbohne in der Augenheilkunde.)

1863.

Difficulties in Ophthalmic use.

I HAVE stated that certain difficulties occur in forming a preparation of the Calabar Bean which can be conveniently applied to the eye. These difficulties arise from the fact that the alcoholic extract, which contains the whole of the poisonous principle of the bean,[1] can only be imperfectly dissolved in water, and that its alcoholic solution is inadmissible. There is also another difficulty which occurs with all liquids that are required to be dropped into the eye, and that is, that the flow of tears which instantly follows such an application greatly reduces the amount placed in contact with the membrane,—or at any rate renders it very uncertain.

Modes of Application.

These considerations have suggested other expedients for applying the remedy, one of which is to use the extract by itself; another is to employ it diffused through paper, after the manner recommended by Mr. J. F. Streatfeild for the application of atropine;[2] and a third is to use a solution of the extract in glycerine. Each of these methods has certain advantages. The extract, which is prepared by exhausting the finely-powdered bean with alcohol (sp. gr. ·838) and evaporating the solution, is not a homogeneous body, but contains a small amount of greenish fatty oil which separates as the solution is concentrated. Its action upon the eye is rapid and powerful. The best means of using it is to moisten a camel's-hair pencil with water, and then with its tip to rub off a minute quantity of extract and apply it to the palpebral conjunctiva of the lower lid:—so applied, its specific action ensues in the course of a few minutes. This method of the direct application of

[1] Since publishing my former paper I have ascertained that the finely powdered bean deprived of everything that alcohol would remove is no longer poisonous to rats.

[2] *Ophthalmic Hospital Report*, Jan. 1862, p. 310; also *Pharm. Journ.*, Jan. 1863, p. 329.

1863.

the extract would probably be hardly advisable in any other than professional hands.

Atropine discs.

The method of applying *atropine* to the eye, by soaking a piece of thin bibulous paper of definite size in a known quantity of solution of atropine and then allowing it to dry, has been recommended in this country by Mr. Streatfeild and in France by Mr. Leperdriel.[1] Such paper should be cut into small pieces from $\frac{1}{5}$ to $\frac{1}{8}$ of an inch square, the proportion of atropine being so regulated that a single square shall represent a drop of the ordinary solution of two grains to the ounce. Paper prepared on this principle with a solution of Calabar Bean answers extremely well, and promises to afford the most definite method of regulating the quantity of the remedy to be applied. The following is the process which I have adopted. One ounce Troy of the bean, reduced to fine powder, is to be thoroughly exhausted by hot rectified spirit (·838); the solution so obtained is to be filtered and evaporated until extract begins to deposit on the bottom of the dish, which will occur when the solution has been reduced to about ten fluid drachms. When cold this solution is to be passed through a small filter, and is then ready for the paper. This may be thin writing paper, the size contained in which has been removed by boiling;[2] it should be immersed in the solution four times, and be allowed to drain and dry between each immersion. Of paper thus prepared, a piece measuring $\frac{1}{8}$th of an inch square placed within the lower eyelid commences to act in about twenty minutes and continues to produce its effect during several hours. Its presence in the eye occasions no uneasiness beyond that which is attributable to the drug.

Calabar Bean, prepared paper.

A solution of the extract of Calabar Bean in glycerine, made in the proportion of $2\frac{1}{2}$ grains of extract in 100 minims of pure glycerine, has also been tried and found to answer well, the glycerine in no way interfering with the action of the extract.

Glycerine solution.

Further experiments may suggest still better preparations: for

[1] *Bulletin de la Société de Pharmacie de Bruxelles*, Mars, p. 93.

[2] Mr. Streatfeild recommends *green* paper, as *white* paper when soaked with tears is not always easily distinguished from the conjunctiva.

1863. some hints respecting those here mentioned, and for numerous careful observations upon them, I have to thank Mr. Charles John Workman of the Royal London Ophthalmic Hospital, Moorfields, and Mr. Bader of Guy's Hospital. [*N. Repert. of Pharm.*, xii. 435.]

MEMORANDUM ON A PRESUMED CASE OF PARTHENOGENESIS IN *ZANTHOXYLUM ALATUM*, Roxb.

(*Read before the Linnean Society, Nov.* 19, 1863.)

1863. In January last Dr. Anderson brought under the notice of the Linnean Society a presumed case of parthenogenesis in a *Aberia.* species of *Aberia*, a shrub of which, in the Botanic Gardens of Calcutta, bore a large crop of well-ripened fruits containing fertile seeds, though only pistilliferous flowers could be detected at the time of flowering.

Zanthoxylum alatum. A case of similar character has come under my own notice; an Indian species of *Zanthoxylum*, the *Z. alatum* of Roxburgh, a dicœcious plant, flowered in my father's garden at Clapham, in the spring of 1862. As I had examined the flowers without being able to detect stamens, and knew that no other plant of the same genus grew near, I was not a little surprised to find the ovaries swell and the berries attain their full development, and still more so when, having carelessly placed three or four seeds in a pot of earth, a seedling *Zanthoxylum* made its appearance.

In the spring of this year the shrub, now removed from the conservatory to the open border, again flowered, and though subjected to a much more careful scrutiny than previously I failed to discover upon it any other than pistilliferous flowers. Still the ovaries became enlarged, and the shrub again bears mature berries, some of which I now exhibit to the Society.

NOTE ON *CASSIA MOSCHATA*, H., B., K.,

1863. (*Read before the Linnean Society, June* 18, 1863.)

Genus *Cassia.* The genus *Cassia* as constituted by Linnæus furnishes medicine, as is well known, two drugs of some importance,

namely, *Senna leaves* and the pods called *Cassia Fistula*, in connection with the second of which I beg leave to submit to the Linnean Society the following observations. 1863.

Cassia Fistula.

Although the name *Cassia Fistula*, which is the common commercial designation of the drug, is properly applied to the ripe legumes of *Cassia Fistula*, L., only, it sometimes designates those of *C. brasiliana*, Lam., and, as I shall presently show, those also of a third species of *Cassia*. The legumes of the first-named, which, on account of the laxative saccharine pulp contained between their transverse septa, find a place in many of the pharmacopœias of Europe, are familiar to most botanists; they are straight or slightly curved, cylindrical, smooth, indehiscent woody legumes, 1½ to 2 feet long by ¾ to 1 inch in diameter, and of a deep chocolate-colour. The legumes of *C. brasiliana*, which are seen in commerce but rarely, differ from those of *C. Fistula* in being compressed and thicker, and in having two prominent ridges marking their ventral suture and one similar ridge their dorsal; from each suture ramify prominent nerves, giving a rough surface to the legume, which is increased by a cracking and exfoliation of the epidermis.

Cassia brasiliana.

Third species of Cassia noticed by M. Guibourt and Mr. Morson.

The third form of the drug was distinguished several years ago by Professor Guibourt, of Paris, who described it under the name of *Petite Casse de l'Amérique*, observing that it differs from ordinary *Cassia Fistula* in being of smaller size, in containing a pulp of pale colour, and austere, astringent, yet saccharine taste, in the seeds being separated by thinner septa, and in the extremities of the legumes being apiculate instead of rounded. M. Guibourt regarded these pods as derived from a variety of *Cassia Fistula*, L., or possibly from a different species. My friend Mr. Morson has also observed some *Cassia* pods of unusually small size imported into the London market from New Granada, and which were apparently identical with M. Guibourt's drug. In some of them, which he was kind enough to give me, I could detect no differences which appeared sufficient to distinguish them from the legumes of *Cassia Fistula*, L., to which plant I referred them, attributing their slight variation to want of culture or a poor soil. A few months ago,

1863.

Mr. Sutton Hayes' *Cañafistola de purgar.*

however, Mr. Sutton Hayes, of Panama (to whose kindness I am indebted for many interesting communications), sent me several pods marked *Cañafistola de purgar*, which I recognised as the small variety of *Cassia* of Messrs. Guibourt and Morson. In reply to my remark that they were derived from *Cassia Fistula*, L., Mr. Hayes observed, "I think you are wrong as to the tree which produces the pods I sent you being a form of the true *C. Fistula*. I have often seen both trees; and the true *C. Fistula* is much less like the *Cañafistola de purgar* than many other species of *Cassia*. The flowers of *C. Fistula*, L., are of light yellow and in very long racemes, and the leaflets are different in shape and much larger. The flowers of the *Cañafistola de purgar* are yellow, becoming brick-red with age; the racemes are much shorter than those of *Cassia Fistula;* and the leaflets are altogether different, being much smaller and quite like those of *C. brasiliana;* in fact the *Cañafistola de purgar* is much nearer *C. brasiliana* than it is to *C. Fistula*. The wood of the tree is very dark-coloured, heavy, and compact, and is considered one of the best on the Isthmus: it makes excellent fuel. The tree is very common in open woods on hills, and is perfectly indigenous; whereas *C. Fistula* is to be found only about towns and in old cleared places, as if introduced. I have never seen *C. Fistula* in the virgin forests. *C. brasiliana* is very common about Panama."

Botanical characters.

Cassia moschata.

Upon examining Mr. Hayes's plant and comparing it with the species of *Cassia* already described, I have found it to agree with the *Cassia moschata* of Humboldt, Bonpland, and Kunth, so far as the characters of that plant have been recorded; and M. Triana, who is now engaged on the Flora of New Granada, and has compared Mr. Hayes's specimens with the type specimens in Paris, has arrived at the same conclusion. As the notices of this plant hitherto published are quoted entirely from the *Nova Genera et Species*, the authors of which have not seen the flowers, I have thought it desirable to draw up a complete description, which I have now the honour of laying before the Society.

CASSIA.—Sect. *Fistula*, DC. Subsect. *Ebracteatæ*. 1863.

C. moschata (H., B., K., Nova Genera et Species, vi. 338); arborea; foliolis multijugis, oblongis, apice rotundatis, utrinque pubescentibus deinde supra glabrescentibus, antheris glabris, leguminibus cylindricis.

DC. Prod. ii. 489; Vogel, Synopsis Generis Cassiæ, 11; Walp. Rep. i. 812; *Cathartocarpus moschatus*, Don, Syst. of Gard. and Bot. ii. 453.

Hab. Ad isthmum Panama, ubi ab incolis *Cañafistola de purgar* vocatur (*Sutton Hayes*, No. 58); ad fluvium Magdalena (*Humboldt et Bonpland, Triana*); ad ripam fluminis Casiquiare paulo infra ostium superius, arbor unicus ab Orinoco, ubi abundare dicitur, allatus (*Spruce*, No. 3300); ad pagum Villavicencio prope Bogota (*Triana*, No. 4376). Habitat.

Arbor 30–40-pedalis, ramulis novellis flavescenti-pubescentibus. *Folia* alterna, abrupte pinnata, petiolo communi 4–10 poll. longo, pubescente, supra pubescentia ampliore flavescente. *Foliola* 10–18-juga, subopposita vel alterna, oblonga, inæquilatera, basi utrinque rotundata, apice obtusa, interdum mucronulata, reticulato-venosa, 1½–2 poll. longa, 6–7 lineas lata, margine integerrimo, pubescente, nervo medio subtus prominente, pubescente, pagina foliolorum superiore nitida parce et breviter pilosa vel glabrescente, inferiore fuscescenti-pilosa vel puberula. *Stipulæ* triangulares, caducæ. *Racemi* laterales, 6–10-pollicares, simplices, graciles, puberuli. *Flores* flavi, mox rubescentes. *Pedicelli* ad 5 lineas longi, gracillimi, minute pubescentes. *Calyx* quinquesepalus, puberulus vel glabrescens, sepalis rotundatis, obtusis, concavis, reflexis. *Petala* quinque, concava, reticulato-venosa, flava, glabra, subæqualia, semipollicaria; superius ovale, longe unguiculatum, altera suborbiculata, breviter unguiculata. *Stamina* decem, inæqualia, glabra; quatuor inter se æqualia, corolla parum breviora; tria his triplo vel quadruplo longiora, curvata, basi geniculata; tria brevissima, quorum lateralia incurva, medium filamento crasso, dilatato. *Antheræ* staminum quatuor breviorum ellipticæ, bilobæ, basi et apice biporosæ, dorso medium versus affixæ; antheræ staminum trium Arbor. Flores.

1863. longiorum late ellipticæ, birimosæ, introrsum dehiscentes, basi affixæ; antheræ staminum trium brevissimorum birimosæ, tribus supradescriptis haud dissimiles sed valde minores. *Ovarium* longe stipitatum lineare, adscendens, falciforme, margine superiore basin versus parce pilosum, aliter glabrum. *Stigma* oblique truncatum. *Legumen* cylindricum, rectum, 1–1¼-pedale, lignosum, durum, læve, corticatum, breviter apiculatum vel obtusum, septis transversis numerosis ut in *Cassiæ Fistulæ*, L. legumine (cui simillimum) instructum. *Semina* ovato-rotundata, compressa, nitida, durissima, 3 lineas longa, coloris cinnamomei in succo saccharino adstringente immersa.

Legumen.

Distinctive characters of *Cassia moschata.*

Cassia moschata, as remarked by the authors of the *Nova Genera et Species*, as well as by Mr. Sutton Hayes, is nearly allied to *C. brasiliana*, Lam.; but it is easily distinguished from that plant by its comparatively glabrous yellow flowers and its totally different legumes. These legumes are stated by both Mr. Hayes and M. Triana to be used in medicine in New Granada instead of those of *C. Fistula*, L.; so that their occasional appearance in European commerce is not surprising. They differ from the latter by their smaller size, less regularly straight and cylindrical form, and especially their paler and less saccharine pulp, which, when fresh, is stated to have a slightly musky odour. These characters are of but little value botanically; the leaves however of *C. moschata*, its shorter racemes, and nearly glabrous ovary, amply suffice to distinguish it from *C. Fistula*, L. [*Transact. Linn. Soc.*, xxiv. (1864), 161.]

NOTE ON *CASSIA MOSCHATA*, Humb. B. K.

(*Pharmaceutical.*)

1864. Among the many botanical treasures with which the travels of Humboldt and Bonpland enriched the herbaria of Europe, and which were described in that noble work the *Nova Genera et Species Plantarum*, is a species of Cassia discovered on the shores of the Magdalena in New Granada. This plant was placed by Kunth in that section of the genus of which *Cassia*

1864.

Fistula, L., is the type, and which is characterised by a long, woody, indehiscent legume, divided into cells by transverse septa; and, as the pulp (or more correctly *juice*) surrounding its seeds was found to have when fresh a musky odour, it received the specific name of *moschata*. The specimens collected by Humboldt did not include flowers, and though the fruit was described, it does not appear that specimens were sent to Europe. The plant was therefore known only from the description in the *Nova Genera*, and from specimens consisting of leaves only, one of which is preserved in the museum of Paris. A description of this Cassia was subsequently published in the *Prodromus* of Decandolle, in the *Synopsis Generis Cassiæ* of Vogel, and in Don's *System of Gardening and Botany*, but as none of these authors appear to have had other material upon which to build than the original notice of Humboldt, the plant remained very imperfectly known.

Imperfect specimens of the Plant.

It happened, however, that in the early part of the year 1862 the late Mr. Sutton Hayes forwarded to London from Panama, pods of a species of Cassia known there as *Cañafistola de purgar*, having a strong resemblance to *Cassia Fistula*, but differing chiefly in being of smaller size. In reply to my observation that these pods were simply those of *C. Fistula*, L., apparently somewhat dwarfed by want of culture or a poor soil, Mr. Hayes offered the more accurate information already quoted on page 320.

Cañafistola de purgar.

Mr. Hayes having with his remarks sent me some excellent flowering specimens of this *Cañafistola de purgar*, it became immediately evident that the plant was wholly distinct from *Cassia Fistula*, L. Further examination and a careful comparison with specimens, including the type specimens of *C. moschata*, H.B.K., and some more recently brought from New Granada by my friend M. Triana, proved, as conclusively as in such case was possible, that Mr. Hayes's plant and *Cassia moschata*, H.B.K. were identical. Being now in possession of complete specimens, I presented a description of the plant to the Linnean Society, which, with a figure, has been recently published.[1]

Comparison of specimens.

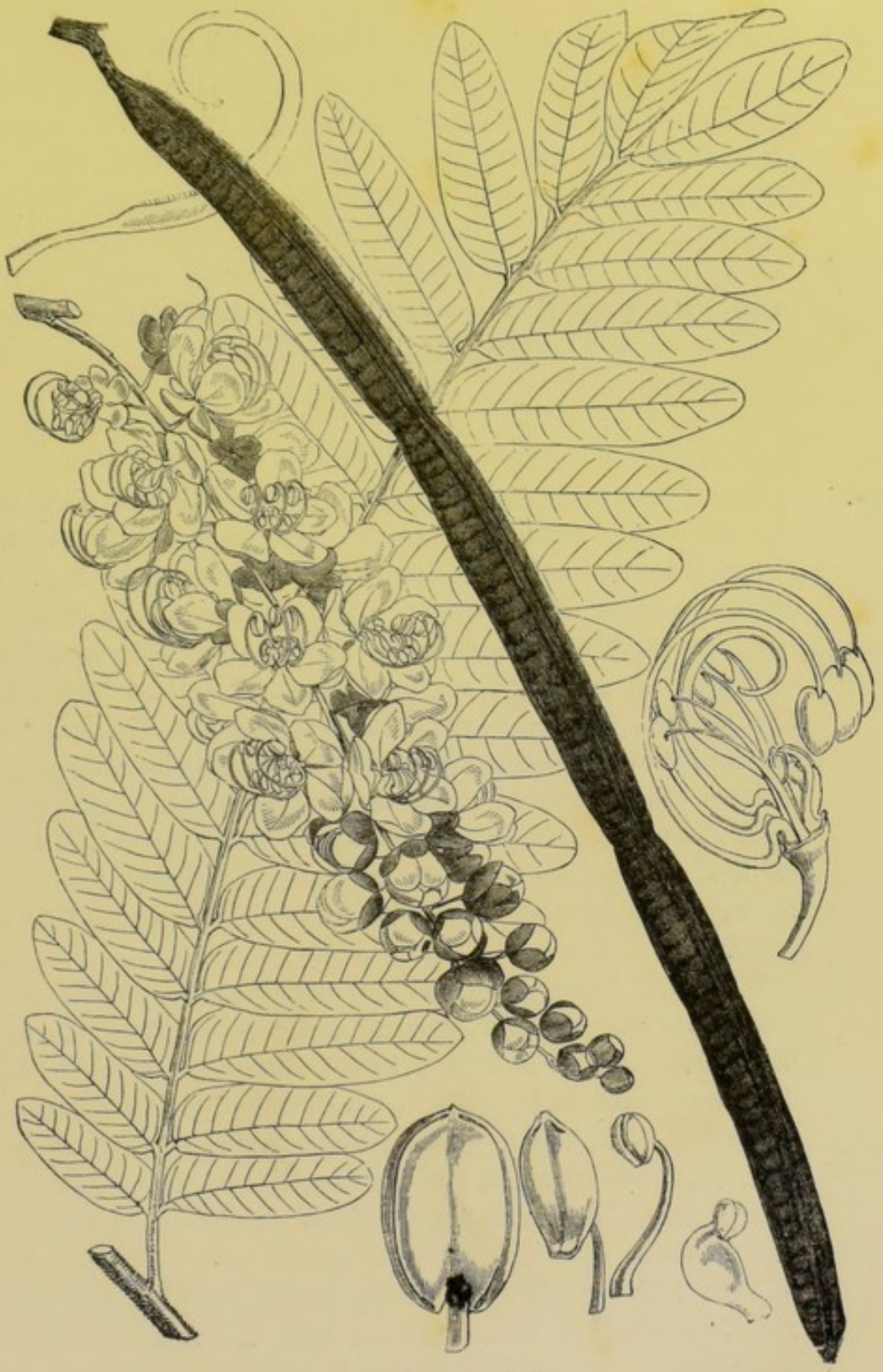
[1] *Linnean Transactions*, vol. xxiv. p. 161, pl. 26.

1864. *Cassia moschata*, H.B.K. is allied to *C. Fistula*, L., and *C. brasiliana*, Lam.: from the first, it is distinguished by its multijugate leaves and shorter racemes; and from the second, by its much smaller legume, which is devoid of prominent sutures. The woodcut represents a raceme of flowers, legume and leaf (somewhat reduced in size); on the right, a flower, the sepals and petals of which have been removed; on the left at top, the stipitate ovary; below on the left, an anther of one of the three long stamens,—next to it, an anther of one of the four medium-sized stamens, one of the two short lateral stamens and the central short stamen with inflated filament (all magnified).

Pharmaceutical details.

But it is in its pharmaceutical aspects that I wish to draw the attention of the Society to *Cassia moschata*. Many years since, M. Henry, of Paris, published a notice of a sort of Cassia which had been imported from America, and had then newly appeared in French commerce.[1] This drug bore a close resemblance to *Cassia Fistula*, differing from it principally in its smaller size, pale-coloured, somewhat astringent pulp, thinner septa, and in the legume being attenuated into a point at either extremity. M. Henry published an analysis of the extract obtained from this Cassia, and contrasted its properties with that afforded by ordinary *Cassia Fistula*, the result showing the two to be exceedingly similar. A description of this Cassia was also published by Professor Guibourt, who expressed the opinion that it might be derived from a species of Cassia distinct from *C. Fistula*, L.[2] Much more recently, my friend Mr. Morson obtained a package of a small variety of Cassia imported from New Granada, which I felt no hesitation in regarding as the *Small American Cassia* (*Petite Casse d'Amérique*) of the French pharmaciens, and which I now consider I am warranted in referring to the *Cassia moschata* of Humboldt and Bonpland. M. Triana, who is now engaged in writing a flora of New Granada, informs me that the legumes of *Cassia moschata* supply the place in that country of *Cassia Fistula*, a fact which renders their occasional importation into Europe not surprising. From *Cassia Fistula*, they may be

[1] *Journal de Chimie Médicale* ii. (1826) 370.
[2] *Hist. des Drog.* iii. 347.



Cassia Moschata, H.B.K.

1864. distinguished by their smaller size (1 to 1½ feet long by 6 to 8 lines broad); their form, which is less regularly straight and cylindrical and often attenuated at the apex; and their pale, austere-tasting pulp. This last character would render their substitution for ordinary Cassia undesirable. [*N. Repert. f. Pharm.* xiii. 1.]

ON THE SPECIES OF *GARCINIA* WHICH AFFORDS GAMBOGE IN SIAM.

(With Plate.)

(*Read before the Linnean Society, April 7th*, 1864.)

1864. More than two centuries and a half have elapsed since one of the old Dutch voyagers, returning from an expedition to India, brought to the notice of his learned countrymen a gum-like substance of an orange colour, to which various important medicinal properties were ascribed. This was the first introduction to Europe of gamboge, a production which, from that time to the present, has been an article of import. But, like many other substances having technical uses, its precise place of production long remained unknown, while its botanical origin has up to the present time not been exactly determined. The object of the present communication is to lay before the Linnean Society some information lately gathered illustrating this latter point.

Introduction into Europe.

The whole history of gamboge, including the various opinions that have been entertained as to its source, and the facts that have been made out during two centuries respecting it, having been admirably told by the learned French pharmacologist, Professor Guibourt, and a *résumé* of them having been given by Drs. Planchon and Triana, in their recent *Mémoire sur la Famille des Guttifères* (p. 196), it would savour of plagiarism here to repeat it. I shall therefore content myself with referring to these writers, and simply state those points touching the origin of this drug which it is desirable to bear in mind on the present occasion.

Professor Guibourt.

Passing over the supposition of Clusius and Bontius, who

1864.

Botanical Origin.

imagined that from its acridity gamboge must be produced by some euphorbiaceous plant, we find that Hermann announced, in the year 1677,[1] that the drug was derived from two trees of Ceylon, now ascertained to belong to the order *Guttiferæ*, one of which is known to modern botanists as the *Garcinia Cambogia* of Desrousseaux, the other being in all probability the *G. Morella* of the same author. Starting from this point, it would seem, remarks M. Guibourt, that each attempt to diffuse more precise and correct information upon this subject has effected the contrary result. I may therefore excuse myself from attempting an explanation of the confusion and intricate synonymy in which the writers of the Linnean period have involved the subject, and state at once that, although it has been well ascertained that one species of *Garcinia* occurring in Ceylon[2] and others in continental India are capable of yielding gamboge, it is equally clear that the whole of the drug found in European commerce is produced in Siam or in regions contiguous to that country. Siam, however, is still unexplored by the botanist; but the gamboge-tree has been transported thence to Singapore, and many specimens of it, cultivated as objects of curiosity, have for some years past been flourishing on the estate of Messrs. José D'Almeida and Sons, of that island. From some of these trees specimens were obtained a few years ago, and transmitted to Professor Christison, who published an account of them in the *Proceedings of the Royal Society of Edinburgh*.[3] Professor Christison has stated that the tree is nearly allied to *Garcinia elliptica*, Wallich, but that it differs from that species in having the male flowers pedicellate instead of sessile. From want of specimens, it appears that Professor Christison did not complete his investigation, at any rate so far as to publish any definition of the plant in question. In the Royal Botanical Garden of Edinburgh there has been, until recently, a living specimen of

[1] Rheede *Hortus Malabaricus*, pt. 1, p. 42. Hermann had resided in Ceylon.

[2] "This [*Garcinia Morella*, Desrouss.] is the only species growing in Ceylon from which gamboge is obtainable; and, as the tree is not uncommon, the pigment might be collected in considerable quantities."—Thwaites, *Enumeratio Plantarum Zeylaniæ*, p. 49.

[3] Vol. ii. (1851) p. 363; *Pharm. Journ. and Trans.*, vol. x. p. 235.

1864.

the same tree; but as it has borne no flowers, it has not been in a condition to render much service in the determination of the species.

Messrs. D'Almeida of Singapore.

Desirous of attempting to set at rest the question of the origin of gamboge, or at least of obtaining further materials upon which to work, I addressed myself some months ago to Messrs. D'Almeida, of Singapore, who promptly and courteously replied to my letter, and forwarded a jar containing an abundant supply of specimens of the gamboge-tree cultivated on their plantations. Messrs. D'Almeida informed me that the trees, of which they have twenty-eight (but which might have been increased to thousands had any pains been taken to do so), are from 35 to 50 feet in height, the largest with a circumference of about 3 feet; and that they grow very luxuriantly, without any attention, on the slope of a low hillock. Messrs. D'Almeida further observe, "*they are the real gamboge-tree;*" and add that at various times they have caused gamboge to be extracted from them.

The specimens received comprise numerous small leafy branches bearing male flowers, several branches with fruits, and a few with female flowers, the whole preserved in alcohol. Professor Oliver has kindly assisted me in examining them, and in comparing them with the specimens of *Garcinia* contained in the herbaria of the British Museum, Kew, and the Linnean Society, as well as with the published descriptions and figures, and especially with the recent memoir of Drs. Planchon and Triana.

Singapore Gamboge-tree.

The Singapore gamboge-tree appeared to us exceedingly nearly allied to the *Garcinia elliptica* of Wallich, of which we examined authentic specimens, and equally close to the Ceylon species *G. Morella*, one of the two plants originally pointed out by Hermann as the source of the drug, and the plant described by Dr. Robert Graham in 1836 as *Hebradendron cambogioides*.[1] From both these, however, it differs in having pedicellate instead of sessile or nearly sessile male flowers—a differential specific character, the value of which in such a genus was to us ques-

[1] Companion to the *Botanical Magazine*, vol. ii. (1836) tab. 27.

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tionable. We therefore transmitted specimens of the Singapore tree to Mr. Thwaites in Ceylon, requesting to have his judgment as to the probable correctness of referring them to *G. Morella*, Desrouss., a plant with which he was perfectly familiar. Mr. Thwaites, whose opinion upon other grounds we regard as deserving much consideration, replied that, although the Singapore *Garcinia* looked a little different from the Ceylon *G. Morella*, there could be but little doubt that it was only a form or local variety of that species. If the correctness of this view be admitted, it will be convenient to designate the Singapore, or rather Siam, gamboge-tree, GARCINIA MORELLA, Desrouss., var. *pedicellata*, and to define it thus :—

Garcinia Morella.

G. Morella, Desroussseaux, in Lamarck, *Encyclop. Méthod.*, Botan. iii. 701, Pl. 405. Fig. 2; Thwaites, *Enum. Plant.*, Zeylan. i. 49.

G. elliptica, Wallich, Catal. No. 4869.

G. Gutta, Wight, *Illustr. of Indian Botany*, i. 126, Tab. 44 (exclus. synon. Linnæi.)

Hebradendron cambogioides, Graham, in Hooker's *Companion to Bot. Mag.* ii. (1836) 193, tab. 27.

Var. *β. pedicellata ;* floribus masculis pedicellatis (pedicelli ad 3 lin. longi).

The *Garcinia elliptica* of Wallich appears to Professor Oliver and myself to offer no characters sufficient to distinguish it specifically from *G. Morella*—a conclusion substantially arrived at by Dr. Graham nearly thirty years ago, and I have therefore added it to the previously admitted synonyms of that plant.

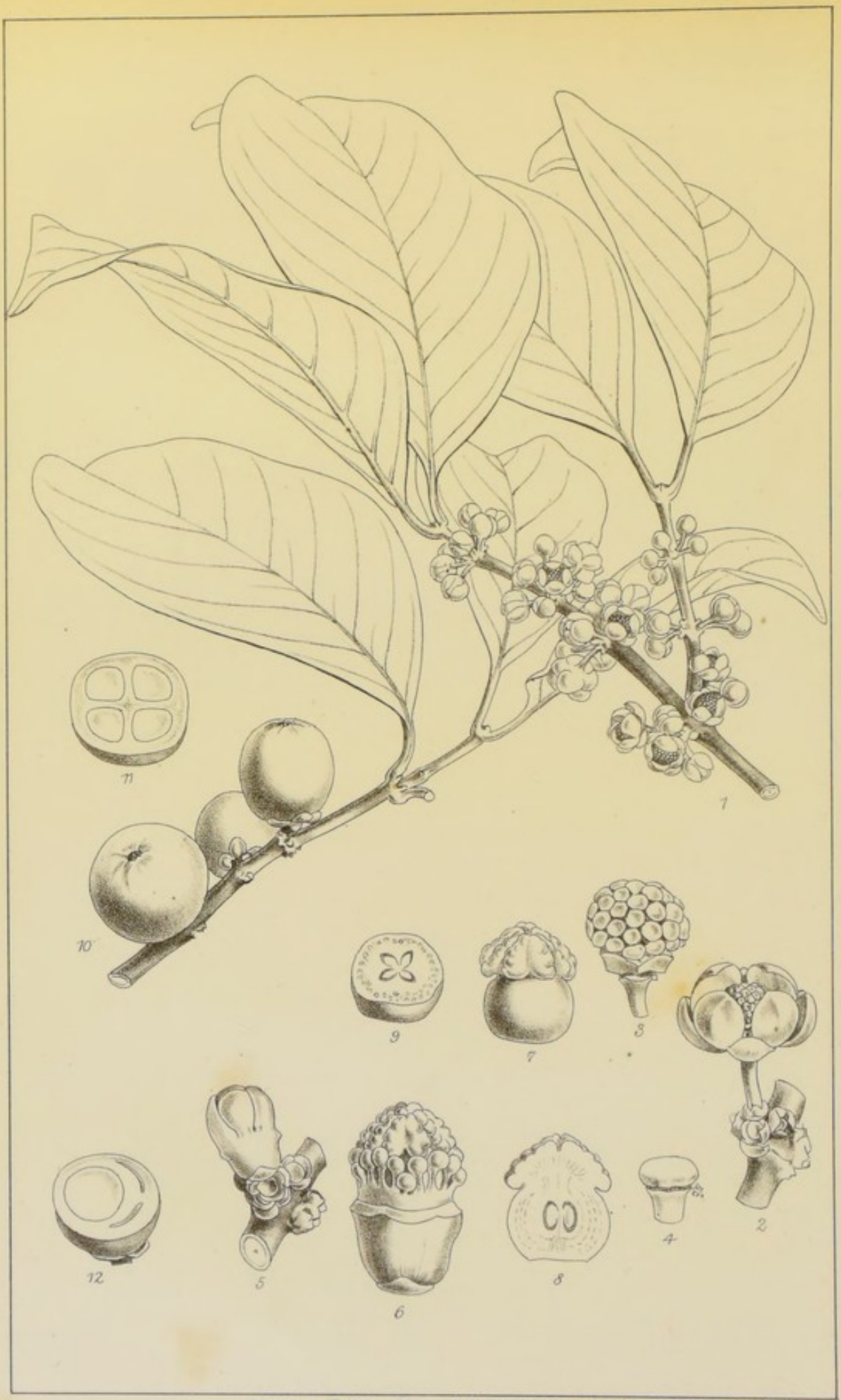
The curious structure of the anther in some *Garciniæ* induced Dr. Graham to propose for certain species a new genus, upon which he conferred the name of *Hebradendron*, which, though abandoned by subsequent botanists, is made the title of a section of the genus by Drs. Planchon and Triana. The examination of the Singapore *Garcinia* has given occasion to Professor Oliver to investigate anew the peculiarities of the circumscissile anther of Graham's *Hebradendron :* the result of this investigation will be best conveyed in the words of a memorandum with

Hebradendron.

1864. which Professor Oliver has favoured me, and which is as follows:—

"The specimens of the gamboge *Garcinia* from Messrs. D'Almeida have afforded me excellent material for the examination of the anthers of this species, which exhibit an unexpected and curious structure, which structure, however, is no doubt common to all the species of the section *Hebradendron*.

Structure of anther. "Professor Graham, in his paper upon *Hebradendron*, in the *Companion to the Botanical Magazine* (ii. 193), quotes an extract from a letter which he had received from the late Robert Brown, in which Mr. Brown pointed out to him 'that approaches to this structure (referring to the circumscissile anthers), and which serve to explain its analogy with the ordinary structure of the family, exist in *Garcinia*.' Messrs. Planchon and Triana, in their excellent memoir on *Guttiferæ*, in the description of their sixth section of *Garcinia* (§ *Hebradendron*), refer thus to the peculiar structure of the anthers:—'antheræ peltatæ rima circulari dehiscentes, ideoque quasi circumscissæ.' Mr. Brown's observation as to the existence of intermediate forms, connecting the structure of the *Hebradendron*-anther with that of other *Garciniæ*, is a true one; but in the genus *Garcinia* there occur two distinct forms or types of anther, and he does not indicate of which form he regarded the *Hebradendron*-anther as a modification. In some *Garciniæ*, as in *G. paniculata*, the anthers are truly peltate, the comparatively slender apex of the filament being attached near the middle of the back of the anther (Fig. 1). In these species the anther-cells are right and left on the upper surface, and the dehiscence is longitudinal, as usual. In some other *Garciniæ* the filament is continued directly into the base of the anther, passing from the base to the apex, the anther being technically adnate. *A priori* the explanation of the *Hebradendron*-anther would be simply this:—that the connective of a peltate anther had become dilated transversely to such a degree that the lines of dehiscence were marginal, and the dehiscence *quasi*-circumscissile, as Messrs. Planchon and Triana term it. I believe, however, that the anthers of the gamboge *Garcinia* are not peltate, that they are truly circumscissile, and that they are a singular adaptation of the adnate type of anther. It would appear as though in this species thick, nearly sessile, and very densely packed anthers, of the adnate type, have their lateral normal polliniferous lobes wholly, or almost wholly, obliterated, and the pollen, lodged in cells of irregular form and number towards and around the apex of the



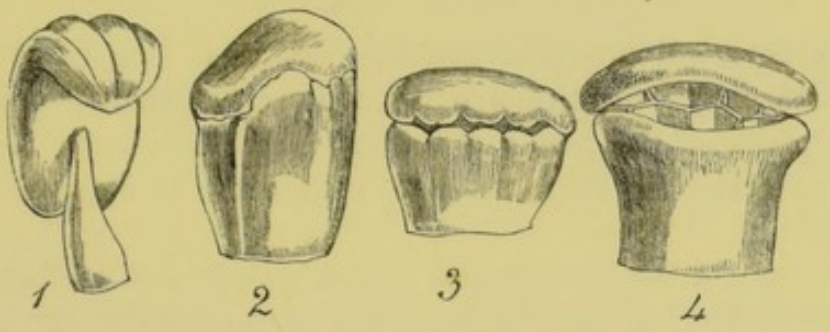
Trans: Linn: Soc: Vol XXIV. Tab 50. *Cooper & Hodson, lith, 188 Strand.*

Garcinia Morella, Desrouss, Var. *pedicellata*.

1864.

Structure of anther.

anther, is set free by a special transverse line of dehiscence adapted to this peculiar condition. Evidence, in support of the view that the anther of *G. Morella* is a modification of the adnate rather than of the peltate form of anther, we find in the circumstance that the pollen is contained in numerous irregular pouches, the anther being, in fact, multilocular, as may



be well seen either in a young anther (Figs. 2 and 3) or in an anther after dehiscence (Fig. 4). The circumscissile line of dehiscence, common to the numerous loculaments of the anther, is continuous all round the discoid apex of the connective, and is not interrupted at two points corresponding to the organic apex and base respectively, as it is in anthers of the ordinary peltate form."

DESCRIPTION OF THE PLATE.

Fig. 1. Branch bearing male flowers.
Fig. 2. Male flower.
Fig. 3. Male flower, calyx and corolla removed.
Fig. 4. Stamen showing the circumscissile anther.
Fig. 5. Female flower.
Fig. 6. Female flower, calyx and corolla removed.
Fig. 7. Pistil.
Fig. 8. Longitudinal section of same.
Fig. 9. Transverse section of ovary.
Fig. 10. Branch bearing fruits.
Fig. 11. Transverse section of fruit, four-celled.
Fig. 12. Ditto, three-celled—one-seeded by abortion.

1864.

ON THE BOTANICAL ORIGIN OF GAMBOGE.

[*Summary.*]

(Read before the Pharmaceutical Society, Dec. 7, 1864.)

(*Garcinia Morella. Stammpflanze des Gutti-Gummiharzes.*)

THE botanical origin of gamboge has been long involved in some obscurity; for although the drug was evidently produced by a plant of the genus *Garcinia*, it has not until recently been possible, for want of good specimens, to determine the species.

Exportation. Hermann, a Dutch naturalist of the seventeenth century, who resided in Ceylon, referred the origin of gamboge to two plants, one of which is known to modern botanists as *Garcinia Morella*, the other as *G. Cambogia;* and we have it on the authority of Mr. Thwaites, Director of the Royal Botanic Gardens of Peradenia, that the former is capable of affording a very good form of the drug, but that such is not the case with the latter. It is, however, well known that gamboge is not an export of Ceylon, but that it is a production of Siam, a country which is still nearly unexplored by the botanist. Whether gamboge in Siam was yielded by the same tree as that which affords it in Ceylon, was a question which could only be settled by a careful examination of good botanical specimens.

Some years ago Dr. Christison, of Edinburgh, received from Singapore specimens of a *Garcinia* cultivated there on the estate of Messrs. D'Almeida and Sons, which *Garcinia* had been brought from Siam as the true gamboge-tree. Dr. Christison, whose account appeared in the *Pharmaceutical Journal* for November, 1850, found this plant to be nearly allied to the *G. elliptica* of Wallich, but to differ from that species in having male flowers pedicellate, instead of sessile. Desirous of carrying the inquiry a little further, and of attempting to set at rest the question of the origin of gamboge, I recently addressed myself to Messrs. D'Almeida who promptly replied to my letter, and forwarded a jar containing numerous specimens of the gamboge-

tree cultivated on their plantation at Singapore. These specimens I carefully examined comparing them with published descriptions and figures, as well as with specimens contained in the herbaria of the British Museum, of the Royal Gardens of Kew, and of the Linnean Society in which investigation I had the valuable assistance of my friend Professor Oliver. The correctness of Dr. Christison's observation respecting the pedicellate flowers was immediately obvious, and it was also evident that the plant, but for this character, bore a strong resemblance to *Garcinia elliptica;* we noticed further that it came equally near to the *G. Morella* of Desrousseaux. Under these circumstances we thought it desirable to obtain the opinion of Mr. Thwaites, who, besides being an excellent botanist, was familiar with various species of *Garcinia* in a living state and especially with *G. Morella.* Mr Thwaites, after examining specimens of the Singapore gamboge-tree, which we had sent to him in Ceylon, replied that the plant was, in his opinion a form of *G. Morella,* scarcely differing from the Ceylon type, except in having pedicellate instead of sessile flowers. This opinion was completely in accordance with that of Professor Oliver and other botanists whose opinion I had asked; and I therefore felt warranted in bringing the plant before the Linnean Society, in whose *Transactions* a figure of it has been published.

1864. Examination of Specimens.

Messrs. D'Almeida informed me that the number of gamboge-trees cultivated on their plantation is twenty-eight. Gamboge has at various times been extracted from them, but rather, it would seem, as an object of curiosity than for the purposes of commerce. (*Transact Linnean Soc.,* xxiv. 487; *N. Repert. f. Pharm.,* xiv. 1.)

ON THE BOTANICAL ORIGIN OF *SAVANILLA RHATANY.*

(*Ursprung der Ratanhia von Savanilla.*)

1865.

It is a fact well known to druggists that the Rhatany root, which formerly found its way into European commerce from Peru, has to a great extent been superseded by another and very

1865.

excellent form of the drug exported from New Granada, and commonly known in the market as *Savanilla Rhatany*. But from what plant this latter drug is derived, or in what part of the vast territory of New Granada it is produced, are points upon which I believe that no definite information has yet been published.

Having endeavoured during some years past to elucidate these questions but without much success, I gladly took occasion of the recent mission to New Granada of Mr. John Weir, collector to the Royal Horticultural Society, to suggest that inquiries should be made at Santa Marta regarding Savanilla Rhatany, and that Mr. Weir should, if possible, visit the locality where the root is collected. The Royal Horticultural Society having accorded permission to Mr. Weir to devote some attention to this object, he soon succeeded in ascertaining that the rhatany in question is obtained from the vicinity of Jiron, a small town lying to the west of Pamplona and about midway between it and the river Magdalena. To this place, Mr. Weir directed his course, arriving there in the latter part of January 1864, when he thus wrote :—

Mr. Weir's mission to New Granada.

Mr. Weir's report.

"*Jan.* 31*st.* Inquiring to-day where the Rhatany plant was to be found, Mr. L. informs me that in various places among the naked hills and savannahs around, the plant grows in plenty, but none nearer than a short day's journey from Bucaramanga. He told me, also, that he used to export large quantities of the drug, but that he had lost $2000 by the last lot he had sent away, and had not sent any for the last twelve months. I saw, however, a quantity of the root in another house, packed in bags ready to be sent away.

. . . . . .

"*Feb.* 1*st.* Started this morning for the valley of Jiron. A few leagues above the village of that name the Rhatany was said to be common, much of the root being there dug for export.

The road lay up the bottom of the valley, following the course of the stream the whole way. Two leagues above the village the plant begins to be frequent, and a league further on there are large tracts covered with it. The soil it grows in is arid, hard, and gravelly in the extreme, so much so that in taking up the root the instrument used is a strong iron crowbar, a little flat-

1865.

tened at the lower end; from the same cause the roots are generally broken into small pieces in the process, it being rather brittle when fresh. The general height of the plant is about four feet, but in some places it seems to grow stronger than in others, and I saw considerable patches of the shrub quite six feet in height.

"I gathered many specimens of the plant in flower and fruit, and also a small specimen of the root attached to the stem and branches." [1]

The specimens here alluded to, consist of the pressed and dried plant bearing flowers and fruits, and stems with roots attached, the last being in every respect identical with the Savanilla Rhatany of commerce. A slight examination sufficed to prove the plant a species of *Krameria*, and the next point of interest was the determination of the species. Turning to the newly published *Prodromus Floræ Novo-Granatensis* of MM. Triana and Planchon, one finds three species of *Krameria* there enumerated, namely, *Kr. Ixina*, L., *Kr. grandiflora*, St. Hil., and *Kr. spartioides*, Kl., to the first of which Mr. Weir's plant proved to be most nearly related. Unfortunately no specimen of *Kr. Ixina* now exists in the herbarium of Linnæus, but in that of the British Museum there are two, representing that form of the plant which has been figured by Hayne.[2] From this type the New Granada plant differs in having leaves which in the young and vigorous shoots have a spathulate rather than lanceolate outline, besides which they are somewhat more hirsute. In flowering shoots of less luxuriant growth, these differences are far less marked, and the plant in this state appears to vary but little from the true *Kr. Ixina*. The flowers and fruits do not present, so far as I have observed, any marked differences.

Examination of specimens.

Upon showing Mr. Weir's plant to my friend Dr. Triana, he at once identified it as the *Kr. Ixina* of the *Prodromus Floræ Novo-Granatensis*, distinguished in his MS. notes as var. *β. granatensis*. Considering the present state of our knowledge of the species

Dr. Triana's identification.

[1] *Proceedings of the Royal Horticultural Society*, Nov. and Dec. 1864, p. 181.

[2] *Arzney Gewächse*, viii. 13.

1865. of *Krameria*, Dr. Triana's determination of this plant as a variety of *Kr. Ixina* appears to me highly judicious, and far safer than the introduction of a new specific name which the receipt of further specimens would probably show to be untenable. I therefore accept *Krameria Ixina*, L. var. *β. granatensis* of Triana as the plant, the dried roots of which constitute the drug known as Savanilla Rhatany.

Krameria Ixina, L.

This form of *Kr. Ixina* has an extensive geographical range, for besides occurring in the locality already mentioned, it exists in Brazil, where it was collected in the island of Itamaraca near Pernambuco by Gardner, who described it as "a shrub about 3 feet high with long spreading branches." Another specimen from the same botanist in the Hookerian Herbarium, is labelled "common on dry hills in the Sertão of the province of Ceará."[1]

ON PHARMACEUTICAL HERBARIA.

(*Pharmaceutische Herbarien.*)

1866. That the well-educated pharmacist should possess a certain familiarity with the plants employed in medicine, and especially with those indigenous to his own country, is a proposition upon which there can scarcely be any difference of opinion. The effort of mind and habits of observation brought into requisition in order to obtain such knowledge are in no small degree beneficial; while the agreeable reminiscences called forth by an inspection of the plants gathered in years long passed are such as may well repay the trouble of forming and preserving an herbarium.

But it is not the formation of a general herbarium or even of an herbarium of British plants, interesting and valuable though they are, that I venture now to advocate. I wish rather to point out the advantage to the student of being able to consult

[1] For further information on the hitherto-described species of *Krameria*, and the various kinds of Rhatany-root found in commerce, the reader may consult a valuable paper by Professor Otto Berg, in the *Botanische Zeitung* for October and November, 1856.

1866.

a small collection of medicinal plants preserved in herbarium-form, and to draw attention to the ease with which such a collection may be formed. One of the regulations imposed by a paternal but despotic government on the continental apothecary is that he shall provide and maintain in good order for the use of his apprentices, an herbarium of medicinal plants. Let us draw a lesson from this. In the British Pharmacopœia about 170 plants are enumerated as furnishing the vegetable Materia Medica prescribed in that work; and of this number more than 50 are either indigenous to or are cultivated in Great Britain. An herbarium comprising even four-fifths of this number would be no unimportant aid to the student who was "reading up" a subject so uninviting to most as Materia Medica. I would not, however, restrict my herbarium to the plants of the pharmacopœia. There is a considerable number that are used in rustic medicine, some of which were held official by the London College of Physicians but a few years back. As instances of this, let me enumerate Woodsorrel, Sweet Flag, Garlic, Marsh Mallow, Asarabacca, Bistort, Bitter Cress, Lesser Centaury, Quince, Carrot, Black Hellebore, Elecampane, Lettuce, Bay, Common Mallow, Horehound, Pennyroyal, Wormwood, Buckbean, Tormentilla, and Coltsfoot. To this number may be added with advantage certain plants which are interesting to the pharmacist from their liability to be confounded with others that are official, as *Pyrethrum* and *Matricaria* which may be mistaken for Chamomile, Fool's Parsley supposed sometimes to do duty for Conium, Hawkbit and *Rhamnus Frangula* which it is said have been passed off for Dandelion and Buckthorn.

Formation and advantage of an Herbarium.

As to exotic medicinal plants, the difficulty of obtaining specimens would, I must admit, be far greater, and the pharmaceutical herbarium must inevitably contain many blanks. Still as the Pharmaceutical Society numbers over 40 members resident in foreign countries, it would not, I believe, be impossible to interest some of them in procuring and forwarding to our secretary specimens for distribution of some of the commoner economic plants occurring in their respective districts. In this way our pharmaceutical herbaria might be enriched with such

Exotic plants used medicinally.

1866.

tropical plants as the Clove, Cinnamon, Allspice, Cassia Fistula, Pareira Brava and Quassia.

Public Herbaria.

One of the more complete herbaria of the character I have attempted to describe ought to be preserved at Bloomsbury Square, and others in the rooms of the Branch Societies at Edinburgh, Liverpool, etc.; but in addition I would suggest to those who feel or wish to feel interested in botany, to commence themselves the formation of an herbarium of medicinal plants, taking as a nucleus those commonest plants of our gardens, fields, hedgerows and commons, the Cherry-Laurel, Lavender, Dandelion, Bittersweet, Elder or Foxglove.

Mounting botanical specimens.

It is unnecessary here to describe the simple operation of preparing botanical specimens (an operation for which a pharmacist has several facilities); but a few words may be said on the best method of mounting them so as to render them at once convenient for reference, and as little liable as possible to sustain injury from handling and from the depredation of insects. In the first place it should be a rule that no specimen should be mounted unless previously brushed over with an alcoholic solution of corrosive sublimate, a precaution against the ravages of a certain mischievous little beetle, extremely ready to prey on dried leaves. Specimens having been subjected to this operation should be redried with slight pressure, and are then ready to be fastened to the paper on which they are to be ultimately preserved. This may be done simply with short, narrow strips of paper, gummed or glued so as to hold down the stems and more prominent parts. Specimens thus fastened can be readily removed, when it is desirable to replace them by better; but for an herbarium that is to be frequently handled (and by others than its owner) it is preferable to resort to a method of attaching specimens still more secure, and this is conveniently effected by the use of common glue brushed while hot over at least a portion of the specimen. Strips of gummed paper may be conveniently used in addition for the better securing of woody stems, roots, bulbs, and such like. The paper on which specimens are mounted should be good and stout, and in oblong pieces measuring about 17 inches by 10. The usual

Paper for Mounting.

1866.

The Pharmacist's herbarium.

method of putting by mounted specimens is to place them loose in brown-paper covers, which are afterwards arranged one above another in the pigeon-holes of a cabinet. For an herbarium specially pharmaceutical, comprising as it necessarily would but a limited number of specimens, a large book made so as to open flat, would probably be even more convenient than the ordinary loose sheets in covers. The specimens would be retained in proper sequence, and be more compact and manageable than if upon separate sheets. Some well-arranged volumes of this kind would afford much of the benefit to be derived from engraved figures; in fact, in many cases the examination of an actual specimen is far more impressive and informing than the inspection of a plate. The authors of the British Pharmacopœia have carefully mentioned in what works figures may be found of the several plants enumerated in that volume. The number of works thus referred to is twenty-six; many of them are of great rarity and quite inaccessible to the majority of persons who would wish to consult them, while to purchase the whole series a sum would be required approaching £230.

I trust I have said sufficient to show that the formation of herbaria of medicinal plants is a subject that merits some attention at the hands of the Pharmaceutical Society.

REMARKS ON THE NECESSITY FOR A FURTHER CULTIVATION OF MEDICINAL PLANTS.

(*Cultur officineller Pflanzen.*)

1867.

Fluctuation of Price.

All who are engaged in the buying or selling of drugs are well aware of the remarkable fluctuations to which such commodities are liable; all know that a drug which at one time is scarce and high-priced may suddenly become so plentiful as to be nearly unsaleable. This is especially the case with drugs recently introduced and for reasons which it is not difficult to explain. A drug, the production of a foreign country, introduced as a novelty, is at the commencement commonly in few hands, and hence a monopoly existing, a high price is obtained. If the sale prove considerable and the drug bid fair to have

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important uses, this high price leads to inquiry abroad and usually to the shipment of large supplies,—often so much too large as to involve the owners of the commodity in great loss. A reaction ensues, no one will import what has been unremunerative, and consequently after the lapse of time the drug grows scarce, until the price mounts to a figure high enough to tempt a fresh importation. The scarcity of old-established drugs is dependent on a variety of circumstances, some of which are curious from the remoteness of their effects. Thus the demand for cotton consequent on the war in the United States, stimulated the culture of that crop in Asia Minor ; and as the growing and picking of cotton required many hands, the wages of the peasantry so greatly advanced that it was less profitable than usual to collect Scammony, and hence a reduced supply and enhanced price of that drug.

Fluctuation of imported drugs.

Political convulsions impeding the freedom of commerce, also operate extensively in diminishing the exports of a country—and to such cause may be attributed the late high price of snake-root, senega and other drugs of the United States. The increased value of jalap is probably due to the unsettled state of Mexico.

Kino.

East Indian kino of the best kind is a drug which during the past few years has become exceedingly scarce, or I might say has ceased to be imported. Now this sort of kino, which was produced near Tellicherry, was a few years ago brought into competition with kino from another district of India, which though considered inferior in quality was freely sold and at a much lower rate than the old drug. The price of Tellicherry kino consequently fell enormously, and it would seem that the drug has ceased to be brought into the market.

Ipecacuanha.

Ipecacuanha again has doubled in value since 1850 owing partly, it is said, to the extirpation of the plant from old habitats and the consequent necessity of collecting it from new and more distant localities, and partly to the circumstance that the stock of the drug is in the hands of but few persons, who are thus able to restrict the export and in consequence to raise the price.

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Improvident collection.

The rarity of a drug or its total disappearence is due in some cases to an improvident and ruinous method of collection. Thus, a century ago there was still found in commerce Loxa bark that had been stripped from tree-trunks of no mean dimensions, and some such bark which I have seen has a thickness of a quarter of an inch and is rich in alkaloids. At the present day, old trees yielding this species of bark are unknown, all the Loxa bark of modern commerce being derived from shrubs, which are stripped even to their smallest twigs.[1] The same fate seems likely to fall (if it has not already done so) on the red bark of Ecuador, the thick or *tabla* form of which, derived from the trunks of old trees, is becoming more and more rare.

Red bark.

Mr. Spruce, who in 1859 visited the forest of Azuáy in the Quitenian Andes in order to examine the species of cinchona which occur there, found that the red bark was in process of rapid extermination, prostrate naked trunks, in some places surrounded by saplings, being the only remnants which he met with of this valuable species. The slopes of Chimborazo, which the same traveller visited in the succeeding year, offered similar evidence of an improvident and destructive method of bark-collecting, the very roots of the trees having been in many cases dug out and stripped of their bark. This valuable cinchona is, however, now so well established in India (the number of trees on the Neilgherry Hills alone amounting in May 1866 to 297,465,)[2] that there is no danger of an utter failure of red bark, at all events of such as may be obtained from young wood.

Causes of scarcity.

The advanced price of scammony already mentioned, presents an instance in which the supply of a drug is diminished by the introduction of a more profitable object of commerce. This cause, combined with the clearing of forests, has operated still more strongly in the case of some drugs the demand for which has been small and uncertain. Thus it has been more advan-

[1] Cross, *Report on Expedition to Procure Seeds of* Cinchona condaminea *in the Forests of Loxa*, November 1861.

[2] Parliamentary Return, ordered by the House of Commons to be printed 18th June 1866.

1867. tageous to grow sugar, coffee, cotton and cacao than to collect the forest-products which in earlier times formed articles of trade. To this cause I think we must attribute the disappearance from commerce of such drugs as South American Elemi, Liquidambar Resin, the fragrant Tacamahaca, Caranna, Winter's Bark and Contrayerva Root, all of which were furnished by the Spanish colonies a century ago.

Rhodium wood.

Turning to the Old World, we may note the disappearance of the sweet-scented Rhodium wood once found in our shops. This substance is derived from two remarkable shrubby species of Convolvulus occurring in the Canaries, in which islands, however, as I have been informed by Dr. Bolle, who at my request made special inquiries on the subject, no shrubs are now to be found having woody stems thick enough to be worth collecting. The oil of Rhodium sold in the shops is well known to be an artificial compound.

Sagapenum.

Sagapenum may also be mentioned as a drug that has almost ceased to be imported; and it is one of which we know neither the botanical source nor exact place of production, a remark that applies to another gum-resin of the same class, namely,

Opopanax.

opopanax.

Necessity for cultivation.

From considerations such as the foregoing, it becomes evident that the supply of many drugs which are obtained without culture is of necessity fluctuating and precarious and most persons will be disposed to acquiesce in the remark of an accomplished modern traveller and naturalist, that "whatever vegetable substance is needful to man, he must ultimately cultivate the plant producing it." This indeed is a truth exemplified in many ways. In the animal kingdom we find it needful to cultivate, so to speak, both oysters and salmon, while partridges, pheasants, grouse, hares and foxes all receive in our island protection sufficient to save them from extermination. In the vegetable kingdom, and in that branch of it with which we have to do, there are several medicinal plants once easily procured in a wild state which it has now become necessary to cultivate. Henbane, belladonna, foxglove, hemlock, pennyroyal and valerian have all to be cultivated, in order that

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they may be obtained abundantly and regularly: and it seems probable that even the common dandelion may soon be honoured with the cultivator's care. These, however, are examples of the cultivation of plants in the country in which they are indigenous.

Cinchona.

The introduction of the cinchona into the Dutch and British East Indies presents an instance, and a very remarkable one, of the culture of an exotic plant hitherto only know in a wild state. I do not intend here to survey the progress of cinchona plantations. Their success, however, is so promising that it should stimulate further enterprise of the same kind, and especially the introduction to India of ipecacuanha.

Ipecacuanha

The ipecacuanha plant, *Cephælis Ipecacuanha*, A. Rich., which belongs to the same order as the cinchona, is a native of Brazil, where it occurs in shady humid forests, lying between the 8th and 20th parallels of south latitude. The plant is also found in New Granada, in which country, however, its root is not collected to any large extent. The supply of the drug is therefore drawn from Brazil, whence in 1862 it was exported to the value of £11,225.

The consumption of ipecacuanha in India is large, as may be judged from the fact that the Indian Government purchased 3,571 lbs. of the drug in the year 1860, 4,011 lbs. in 1859, 2,636 lbs. in 1858 and 1,386 lbs. in 1857. We know but little as to the susceptibility of the ipecacuanha plant for cultivation. In the hothouses of our botanical gardens, where it is by no means common, it appears as a humble plant of slow growth and tender appearance. In attempting its culture in India the first object should be to procure from Brazil a supply of recent mature seeds, which should be transmitted to Europe in the most rapid manner for distribution, it may be suggested, among the cinchona cultivators in our own possessions, as well as those in the Dutch East Indies and in Algeria.

One special advantage that accrues from the cultivation and preparation of medicinal plants by civilized and intelligent persons, is the much better condition in which they are presented to commerce. As an instance of this I may cite

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Tinnevelly senna.

Tinnevelly senna, which is but a cultivated form of the senna produced on the shores of the Red Sea, and known from its port of shipment to Europe as Bombay senna. How remarkable the contrast between these two drugs! Would not similar advantages be derived from the cultivation in India of Columba root? This drug as imported is invariably found to be more or less worm-eaten and is often in other respects ill-conditioned—defects attributable, as I believe, to the slovenly manner in which it is dried, stored and packed. The plant, which is indigenous to Mozambique, flourishes perfectly in Mauritius and would probably thrive with equal luxuriance in Ceylon and Continental India.

Columba root.

Hemidesmus root and Chiretta.

There are two other drugs which I have often thought it would be advantageous to procure in a better condition than we now usually find them; and these are Hemidesmus root and Chiretta, both of which are often imported in an unsound state. Some of the former, kindly collected for me in Madras by Dr. Lestock Stewart, contrasted most favourably with the Hemidesmus ordinarily imported.

Jalap.

Another drug which it appears to me might be obtained in far better condition by the exercise of more intelligent skill is jalap, but as I have prepared some remarks in a separate form upon this drug I will not in this place say more.

Let me in conclusion commend attention to the words with which I commenced this paper—the necessity for a further cultivation of medicinal plants. [*N. Repert. f. Pharm.* xvi., 365.]

ON THE CULTIVATION OF JALAP.

(*Cultur der Jalapenwinde, Ipomœa Purga.*)

1867.

The considerations which render it expedient that the cultivation of jalap should be attempted in some other country than that in which the plant is indigenous, are the following:—

1. The present supply of jalap is precarious and fluctuating.

2. The drug is often of bad quality even when genuine, owing to the rude method in which the tubers are dried, and frequently to their having been collected while too young and small.

3. The frequent admixture of other roots with the jalap of commerce. 1867.

Essential requisites.

The cultivation of jalap to be successful must result in producing the drug identical in medicinal activity with that hitherto employed, of uniform good quality, of moderate price, and in sufficient quantity to be noticeable in the market. Experience alone can determine whether all or only some of these desiderata can be attained.

Let us now consider what is the climate, and what the soil, of the region in which the jalap-plant (*Exogonium purga*, Benth.) naturally thrives; and what the method actually pursued for collecting and preparing the drug for the market. On these subjects the most graphic information that I have met with, is contained in a letter addressed by Dr. Schiede, a German traveller and botanist, to Dr. D. F. L. von Schlechtendal; it bears date Mexico, 26th October, 1829, and was published in the periodical called *Linnæa* the following year. Of this letter, the following is a translation :—

Dr. Schiede.

Before I leave Chiconquiaco[1] I must communicate to you the most interesting facts which I have observed on the occurrence of *Convolvulus Jalapa*, as well as what I have learnt respecting the collection of the root and its preparation for the market. In my last collections from Jalapa, I sent you a large number of flowering specimens, and added a short description of the plant, so that this latter I may here omit.

Jalap.

The herbaceous plant whose tuberous root furnishes the almost indispensable medicine called *jalap*, does not grow in the immediate vicinity of Jalapa, but several thousand feet higher on the eastern slopes of the Mexican Andes, especially about Chiconquiaco and the neighbouring villages, and also, as I hear, about San Salvador, on the eastern slope of the Cofre de Perote. The mean altitude at which the plant occurs may be stated as about 6000 feet. In this region it rains almost the whole year through. During summer fine clear mornings are commonly succeeded by violent showers in the afternoon; in winter indeed these latter do not occur, but dense mists lie for days and weeks with but few clear intervals, on the mountains as well as on

[1] Chiconquiaco is a village situated on the mountain known as the Cofre de Perote, and in the region called by the Mexicans *Tierra fria*.—D.H.

1867. their declivities. The plant prefers shade, and is found only in woods where it climbs over trees and bushes. The flowers appear in August and September. The root is dug up during the whole year, but probably that is preferable which is collected before the young shoots appear,—that is to say in March and April. The tubers are sometimes elongated, sometimes round, and always terminate in a rootlet. In the fresh state they are whitish, almost inodorous and full of a viscid juice which has a peculiar acrid taste. When collected, the large tubers are cut through, but the smaller left entire. As drying them in the sun would probably be impracticable, they are placed in a net and then hung over the almost-constantly burning hearth where by degrees they dry, and by which process they almost always acquire a smoky appearance and somewhat sooty smell. In about ten to fourteen days the *Purga* is dry, and is then taken by the collectors who are mostly Indians, to Jalapa, where it is bought up, and whence it is conveyed by way of Vera Cruz into the markets of Europe.

Drying the tubers.

Garden cultivation of Jalap.

The Indians of Chiconquiaco are commencing to cultivate the jalap plant in their gardens. The future will show whether its powers are in any degree impaired by cultivation. Cultivation will afford the advantage that the roots may be collected at the most favourable time of year, which in the thick forests is attended with difficulty. I do not abandon the hope that *Convolvulus Jalapa* may some day be planted in our gardens on a large scale; is not the potato a native of a similar region? The plant will scarcely bear the severity of a German winter in the open air, but the spring and autumn frosts will not, I think injure it, for it has to endure the same reduced temperature in its native home.

I now hear that the root has also been exported from Tampico, which shows that it occurs northward of the mountains of Chiconquiaco, perhaps in the Sierra Madre.

To this account may be added a few lines extracted from a letter received from a valued correspondent of my own in Mexico, to whom I am also indebted for more than a hundred living tubers of the jalap plant:—

"The tubers of jalap require a deep rich vegetable soil (*débris* of the leaves of *Pinus*, *Quercus*, *Alnus*, etc.), and as they grow at an elevation of from 7000 to 10,000 feet above the level of the ocean, they can stand a good deal of cold and even frost

during the night. In the daytime from 60° to 75° Fahr. is their almost daily warmth. Around Cordova the plant will not succeed, the climate being too warm. I would advise you to plant some of the tubers out in the free air, treating them like dahlias, that is, to take up the roots in October, and plant them again in March or April. Although the plants may not flower or ripen seeds, the tubers will grow in size, and what is more important, will multiply underground *ad infinitum*. If jalap-roots so far have failed in Europe, it is because they have been treated as hothouse plants." 1867.

Soil and Climate.

Having these data regarding the climate and soil which are natural to the jalap-plant, we must next consider what regions offer conditions sufficiently similar to render the culture of the plant probably successful. It is plain from the accounts I have quoted that a humid climate having a temperature rising in summer to about 75° F. and sinking in winter to the freezing point is that which the plant naturally affects; and this is confirmed by the fact that the plant thrives perfectly well in the open air during the summer months, in gardens in the south of England, but that it will not endure unprotected the severe frosts of winter. Whether the great altitude above the sea-level at which it occurs in Mexico, is an indispensable condition for its complete development, is a point on which we have no information.

Suggestions for cultivation.

In Cornwall and in some localities in Devonshire, as well as on the southern side of the Isle of Wight, it is probable the jalap-plant would thrive in the open ground as a garden-plant during the whole year, and it is very desirable that experiments should be made to determine this point. In Madeira it would probably also succeed well if planted in situations sufficiently elevated.

But if it be necessary to select the situation in the British dominions which for climate and elevation above the sea-level presents conditions most nearly resembling those of the jalap-yielding region of the Mexican Cordillera, we must, I think, look to some localities in India; and of those that can be named the Neilgherry Hills in the Madras Presidency offer perhaps the greatest combination of advantages for attempting the culti-

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vation of jalap. Not only is there a Government garden at Ootacamund, where the plant might in the first instance be cultivated, but there are numerous other localities in the neighbourhood, slightly differing in climate and soil, where experiments might be carried on. To these advantages must be added the fact that Ootacamund is the habitual residence of numerous intelligent Europeans, whose attention has been specially directed, in connection with cinchona-culture, to those circumstances of soil, climate, and planting, on which the successful introduction of a foreign plant is dependent.

Advantages offered at Ootacamund.

There are doubtless other localities in India, as, for instance, certain regions in the Himalaya, in which the culture of the jalap-plant might advantageously be attempted, but until a supply of the roots is abundant, it will probably be wise to restrict experiments to one spot.

It must not, however, be supposed that no attempts to cultivate jalap have hitherto been made, though it may be safely asserted that none have resulted in obtaining for the market a better supply of the drug. In Mexico, as Schiede relates, the Indians were commencing in 1829 to cultivate the plant in their gardens; and I have been informed by a London druggist that some of the jalap now found in the market is derived from cultivated plants. The late Dr. Royle states that he sent plants obtained from the Royal Horticultural Society and from Dr. Balfour, of Edinburgh, to the Himalayas, where he hoped they would soon be established.[1] In 1862 I forwarded to Mr. N. Wilson, Curator of the Botanic Garden, at Bath, Jamaica, a jalap-plant of which he wrote to me in October 1863, that it was growing luxuriantly at an elevation of 2,000 feet, and that he had no doubt the plant could be cultivated on the mountains of Jamaica as an article of commerce.

Experiments in Jalap cultivation.

The culture of *Exogonium purga*, Benth., is also being

[1] *Manual of Mat. Med. and Therap.* ed. 1853, p. 553. In Birdwood's *Catalogue of the Economic Products of the Presidency of Bombay*, Bombay, 1862, it is stated at p. 57, that *Exogonium purga*, Benth., is "cultivated on account of Government at Hewra." I am, however, assured that there is some error in this statement, and the plant does not now exist in the Hewra garden.



Linn: Soc: Journ: Bot. Vol XI tab 2. Cooper & Hodson, lith, 188, Strand.

Ipomœa simulans. *Hanbury.*

attempted in the south of France by Professor Dr. J. E. Planchon, of Montpellier, and by M. Gustave Thuret, of Antibes, but the summer climate of those localities is so much drier than that of the region in which the jalap plant is indigenous, that success is doubtful. Tubers have also been sent to Madeira. 1867.

There is one other point in connection with this subject upon which we seem to require information, and that is the age at which the jalap tubers can be collected to most advantage. It is well known that the jalap of commerce consists of tubers of all sizes between those weighing a few grains up to such as weigh several ounces; and that the larger and those which are internally most compact, dry and resinous are preferred.

The adoption of a better method of drying the tubers than that at present pursued will also deserve attention. It is probable that this object will be accomplished by slicing the tubers while fresh, and drying them with the gentle heat of a stove. [*N. Repert. f. Pharm.* xvi. 421.] Better mode of drying.

ON A SPECIES OF *IPOMŒA*, AFFORDING TAMPICO JALAP.

(With Plate.)

(*Read at the Linnean Society, December* 16th, 1869.)

Two centuries and a half have elapsed since jalap, the tubercule of a convolvulaceous plant of Mexico, was introduced into the Materia Medica of Europe. The botanical origin of the drug long remained unsettled, evidence of which exists in the fact that two plants, neither of which yields jalap, have in succession received, and still retain, the specific name *Jalapa*. The veritable source of jalap, however, was brought to light between the years 1827 and 1830, in which latter the plant was described by Wenderoth as *Convolvulus Purga*. In 1833 it was figured by Hayne under the name of *Ipomœa Purga;* but in 1839 it was transferred, on account of its tubular corolla and 1870. *Ipomœa Purga.*

1870. exsert stamens, to Choisy's genus *Exogonium*. As this genus has been recently united to *Ipomæa* by Dr. Meisner, it appears best to return to the name proposed by Hayne, and to call the true jalap-plant *Ipomæa purga*.

The unsettled condition of Mexico, and the fluctuations of commerce, have alternately depreciated or enhanced the value of jalap, and have led to the occasional importation of other roots possessing more or less of the characters of the true drug. Of such kinds of jalap, one of the most remarkable is a tubercule imported a few years ago for the first time from Tampico, and thence called Tampico jalap.[1] This drug has been extensively brought into the market (that is to say by hundreds of bales); and though it is less rich in resin and less purgative than true jalap, yet, on account of its lower price, it has found a ready sale, chiefly in continental trade.

Tampico Jalap.

Botanical origin.

As the botanical origin of this so-called Tampico jalap and even its place of growth were completely unknown, I addressed a letter, in November, 1867, to my friend Hugo Finck, Esq., Prussian Vice-Consul at Cordova (Mexico), begging that he would, if possible, procure for me some information on the subject. Mr. Finck at first expressed strong doubts as to Tampico jalap being anything else than the root of *Batatas jalapa*, Chois., known in Mexico as *Purga macho*. Upon inquiry, however, he ascertained that such could not be the case, but that it is a production of the State of Guanajuato, where it grows along the Sierra Gorda, in the neighbourhood of San Luis de la Paz. At this town, and in the adjacent villages, it is purchased of the Indians and carried by the muleteers to Tampico, where it is known as *Purga de Sierra Gorda*.

All attempts to procure specimens of the plant were for some time fruitless, chiefly owing to the difficulty of finding any one in the district who could be induced to take the needful trouble. The perseverance of Mr. Finck and his friend Mr. E. Benecke, Consul-General for Prussia in the city of Mexico, overcame at length this obstacle, but only to meet with others hardly less

[1] I cannot, at least, trace this jalap to have been offered in commerce as a distinct sort earlier than about five or six years ago.

1870.

Specimens from Guanajuato.

embarrassing. The first lot of specimens despatched from Guanajuato was stolen from the mail; the second shared the same fate; while a third, which included live tubercules, was, by successive detentions on the way, fully five months in reaching England. The box, however, came to hand in June last; and amid a mass of damp earth and decaying matter, I had the satisfaction of discovering one solitary tubercule exhibiting signs of vitality. This, placed in a greenhouse and carefully nursed, soon began to grow with rapidity, and, on removal to an open border, produced a tall and vigorous plant, which towards September showed signs of flowering. It was then taken up and replaced in the greenhouse, where it blossomed freely in October last, but did not mature any seeds. Accompanying the tubercules, but of course in a separate box, my correspondent sent some pressed and dried specimens from Guanajuato, which corresponded perfectly with the growing plant.

Successful raising of the plant.

Identification of the plant.

Having ascertained, from the study of these materials, that the plant belonged to the genus *Ipomœa*, I endeavoured to identify it with some species described in the *Prodromus* of De Candolle, or in the subsequently published *Annales* of Walpers, but without success. Neither was I able to find any corresponding specimen in the herbaria of the British Museum or of the Royal Gardens of Kew. In the Paris Museum there is a plant, collected by Galeotti on the lofty Cordillera near Oaxaca, which, so far as a scanty specimen enables me to judge, accords precisely with that received from Mr. Finck. It bears a number which is not mentioned in the enumeration, by Martens, of Galeotti's *Convolvulaceæ* (contained in the *Bulletin de l'Académie Royale de Bruxelles*[1]); and I therefore conclude that it is unnamed. Under these circumstances I have drawn up the following diagnosis and description of the plant which I propose to call *Ipomœa simulans*. The specific name is chosen in allusion to the remarkable similarity which the plant bears in foliage and habit to the true jalap (*Ipomœa purga*, Hayne), not to mention the resemblance of its tubercules. The funnel-shaped corolla and pendent flower-buds of the Tampico jalap-plant are quite

Diagnosis of *Ipomœa simulans*.

[1] Tome xii. pt. 2 (1845), p. 257.

1870. unlike the corresponding parts of *I. purga*, and furnish a ready means of distinguishing the two species:—

Ipomœa simulans, sp. nov. Radice tuberosâ, caule volubili herbaceo glabro, foliis ovatis, acuminatis, cordatis v. sagittatis, indivisis, pedunculis unifloris solitariis, sepalis parvis.

Habitat. *Hab.* in Andibus Mexicanis *Sierra Gorda* dictis, prov. Guanajuato (fide cl. *Finck*); in regione frigidâ ad ped. 8000 prope Oaxaca (*H. Galeotti*, No. 1369 !).

Radix. *Radix* napiformis v. subglobosa v. elongata, carnosa, 2–3 poll. longa, basi fibrillosa. *Caules* herbacei, graciles. *Folia* glaberrima, 2–4 pollicaria, 1–2 poll. lata, lobis baseos acutis v. rotundatis v. subtruncatis, petiolo tenui, $1\frac{1}{4}$-$2\frac{1}{2}$-pollicari. *Pedunculi* axillares, petiolum subæquantes, penduli, uniflori v. in plantâ vegetiore novelli alabrastra duo ferentes, altero semper (ut videtur) abortivo. *Pedicelli* incrassati, basi bracteis 2 minutis. *Sepala* ovata, obtusa, exteriora paullulum breviora. *Corolla* infundibuliformis, $1\frac{1}{2}$–2 poll. longa, glabra, rosea, pallide striata. *Stigma* bilobum. *Capsula* calycem superans, conica, 2–locularis, valvis 4 coriaceis. *Semina* glabra.

Description of the Plate.—Fig. 1, Calyx and pistil; 2, Ovary; 3, Mature capsule: *all magnified.*

NOTE ON CHLORAL.

(*Chloral hydrat als arzneimittel.*)

1869. At the British Pharmaceutical Conference held at Exeter, the President (Mr. Hanbury) drew the attention of the meeting to a specimen of Hydrate of Chloral received from Berlin, where it has been introduced as a remedial agent by Dr. Oscar Liebreich. Chloral in an anhydrous state is a heavy, volatile, colourless liquid produced by the action of chlorine upon alcohol and having the composition $C_2 Cl_3 OH$. If this body is brought into contact with a small proportion of water, the two combine and a solid crystalline hydrate is the result. This substance is extremely soluble in water, affording when pure a neutral solution which is unacted on by nitrate of silver or by acids, but which is immediately decomposed by a caustic alkali, chloroform being set free. This property suggested to Liebreich the idea of employing it therapeutically. He conceived that if it were brought into contact with the blood, chloroform would be evolved in a

gradual manner, and anæsthesia, less transient than that obtained by inhalation of chloroform, would be produced. 1869.

Choral hydrate as an hypnotic.

It was, in fact, found by experiment that hydrate of chloral administered to rabbits produced profound sleep, and similar results followed its administration to human beings. The first case in which man was the subject was that of a lunatic, to whom a dose 1·35 grammes of the hydrate was injected subcutaneously, the effect produced being a sleep of five hours' duration. An internal dose of 3·5 grammes given in a wineglassful of water was followed by sleep which lasted for the rather alarming period of sixteen hours. The ordinary dose recommended by Dr. Liebreich, as an hypnotic, is 2·5 grammes, about 38 grains.

RARE ESSENTIAL OILS.

(Seltene ätherische Oele.)

At the same conference Mr. Hanbury exhibited to the meeting authentic specimens of the following, viz. 1869.

Rare Essential Oils.

Essential Oil of *Canella alba.*
" Clove Bark or Culitlawang.
" Chian Turpentine.
" the leaves of *Pinus sylvestris.*
" " " *Pumilio.*
" the cones of *Abies pectinata.*
" *Ptychotis Ajowan.*
" *Origanum vulgare.*
" Mexican Lignaloe.

With regard to that obtained from the leaves of *Pinus sylvestris,* and sometimes called *Fir-wood oil,* he observed that, administered by inhalation, it has of late been recommended in certain diseases of the throat and respiratory organs.

Oil of *Pinus Pumilio.*

Dr. Morell Mackenzie, by whom in this country it has been chiefly prescribed, has also employed the essential oil of the leaves and twigs of *Pinus Pumilio,* a pine which covers many

1869. of the barren limestone slopes of the Southern Alps at an elevation of 4000 to 7000 feet. This pine is closely related to the common Scotch fir (*Pinus sylvestris*), but has a curious decumbent habit of growth, giving it the aspect of a shrub of 6 feet high with long branches spreading along the ground; seen covering the mountain side it might at a distance be mistaken for furze (*Ulex Europæa*). The essential oil is distilled at Reichenhall, in Bavaria, as well as in other places, and is held in high estimation by the Germans, who use also an aqueous extract made of the leaves, and other preparations. The oils of *Pinus sylvestris* and of *P. Pumilio* have been prescribed in England in the form of emulsion made thus:—

Emulsion of *Pinus sylvestris*.

℞ Olei pini sylvestris ℥ijss
Magnesiæ carbonat. ℥iss
Aquæ destillatæ ad ℥iij

Misce.—One or two teaspoonfuls in a pint of warm water to be inhaled (from an inhaler) for ten minutes twice a day.

Dr. Mackenzie has also prescribed the oils of *Abies pectinata*, of cajeput, of hops, and of sandal wood. The specimen of oil of *Abies pectinata* was distilled in the neighbourhood of Berne. In odour it resembles the fine, transparent and fragrant turpentine which is yielded by the trunk in very small quantity, and which was formerly found in the shops under the name of *Strasburg turpentine*.

The oils of canella, Chian turpentine, ptychotis and origanum were distilled for chemical examination, and have not been employed in medicine. That of lignaloe is used in Mexico as a perfume.[1]

[1] Some account of the wood from which it is obtained will be found in a paper by Mr. Collins in the *Pharm. Journ. and Trans.* for April 1869, p. 590.

HISTORICAL NOTES ON MANNA.

(Zur Geschichte der Manna in Calabrien und Sicilien.)

1869.

WHATEVER was the true nature of the substance provided for the sustenance of the ancient Israelites, and termed by them *manna*, that name has in subsequent ages been used to designate certain saccharine exudations produced in hot countries upon the stems, branches or leaves of trees, shrubs, or herbaceous plants, belonging to various families. Thus in the peninsula of Sinai a sweet substance called *manna* is exuded by a species of tamarisk; in Persia a manna is produced by a small, thorny, leguminous plant, known to botanists as *Alhagi Maurorum;* and in Kurdistan, an evergreen-oak affords an analogous product. These substances have from a remote period been employed as food or medicine, and they are still found, though in small quantities in the bazaars of the East. The cedar of Lebanon, the larch, a *Cistus*, and certain Australian species of *Eucalyptus* likewise yield at certain seasons saccharine exudations in more or less abundance; and those derived from the cedar and larch have occasionally been collected for use.

Ancient manna.

The manna of modern times is well known to have a very different origin, being a product obtained in considerable abundance from the stems and branches of a species of ash cultivated in Calabria and Sicily. With this manna Europe is wholly supplied, and it likewise finds its way into the markets of the East.

Modern manna.

During some conversation last summer with my friend Dr. Flückiger, of Berne, he drew my attention to this curious fact,—that in the early history of Sicily no mention is made of manna as a production of the island. This induced me to look around for further information, the result of which has been the collection of a few notes on the history of this drug, which seem of sufficient interest to be presented.

In the first place, I must thank Colonel Yule, to whom I wrote, thinking that his familiarity with historical research, and actual residence at Palermo, might enable him to impart some hints for my guidance. But he has been good enough to render

Col. Yule's researches.

1869.

me still greater service in furnishing extracts from several authors whose works I might otherwise have overlooked.

Meteoric manna.

With regard to manna which has fallen from the atmosphere, or as it is termed *meteoric manna*, the grand example is that described in the book of Exodus. Of this it may be safely affirmed that, accepting the Mosaic account as the simple narrative of a real event, no phenomenon is known which is at all adequate to explain it.

Oriental fancies.

But there are other examples of meteoric manna which come fairly within the range of natural phenomena, and which it would be interesting to consider did space permit. I may observe that the notion that manna is not the juice of a plant, but that it is of the nature of dew and falls from the sky, is very ancient and still lingers in the East. In the case of the manna-ash, it was disproved by the Franciscan monks Angelus, Palea and Bartholomæus ab Urbe Vetere, who relate how they caused some of the trees to be covered with sheets, so that nothing could fall upon them; and that notwithstanding this precaution, manna was produced as before.[1] But this reasonable conclusion was regarded as scarcely orthodox, and the learned Matthioli was at much pains to supply an explanation more, as he thought, in accordance with Scripture.

The special point, however, which I desire to discuss in this paper relates to the *period* at which ash-manna began to be collected. Manna is mentioned more or less particularly by most of the Arabian physicians with whose works we are acquainted, but the allusions are all to Oriental manna, and not to that of Italy or Sicily. This is manifest from the writings of Ebn Beithar,[2] one of the most eminent and learned men of his time and a great traveller; and who, being a native of Malaga, would probably when speaking of manna have named that of Sicily, the more so as that island, having been for nearly 250 years under Saracenic rule, must have been familiar to the Arabs of Spain. Ebn Beithar is moreover in

Ebn Beithar.

[1] Geoffroy, *Tractatus de Mat. Med.* ii. 587. The whole disquisition of this author, *De Mannâ Solutivâ*, is replete with information.

[2] Ed. Sontheimer, 1840-42. i., 207., ii. 533.

the habit of quoting extensively from other authors. He died about A.D. 1248. 1869.

One fact may be held to prove that the Saracens were not entirely ignorant of the production of manna in Sicily, and it is this—there exists a mountain near Cefalu which is called by the Arabic name *Gibil-manna*, literally *Manna-mountain*.[1] Other mountains in the island retain the Arabic name of *gibil*. Whether the word *manna* was affixed subsequently to the Saracenic occupation, or whether, as is more probable, the whole name was bestowed by the Arab population in virtue of the trees of the mountain yielding manna, is a point I am unable to decide.[2] *Gibil-manna.*

In the thirteenth century, Sicily was under the dominion of the Emperor Frederic II., a sovereign who appears to have been very solicitous to develop its resources, as is proved by many documents extant relative to the affairs of the island. Thus in a letter dated A.D. 1239, he directs that certain Jews settled at Palermo are to farm his date plantations at Favara, and to cultivate them after their own manner. He also writes about the cultivation of vineyards and the introduction of indigo and henna, and of divers other plants of Barbary, not then known to grow in Sicily. But so far as I can discover, there is no allusion to manna.[3]

Pegolotti, an Italian who wrote a sort of mercantile handbook *circa* A.D. 1340, has a chapter on Messina and Palermo, but does not mention manna as a production of Sicily; yet in enumerating the articles sold by the pound at the former city, he names manna apparently as a foreign production, since he couples it with cloves, cubebs, rhubarb, mace and long pepper. Pegolotti, A.D. 1340.

Further evidence of a negative sort is afforded by Giovanni di Antonio da Uzzanno, who in his work called *Libro di Gabelli*, written *circa* A.D. 1442, mentions the exports of Naples and of

[1] Amico, *Lexicon Topographicum Siculum*, iii. (1760), 242.

[2] Colonel Yule has remarked that Salmasius, in his *Exercitationes Plinianæ*, alludes to Σικελικὸν μάννα as mentioned by the *Medici recentiores Græci*, but without specifying more particularly who they are.

[3] *Historia Diplomatica Frederici Secundi*, par J. L. A. Huillard-Bréholles, t. iv. 213; t. v. 571.

1869. Calabria as wine, oil, corn, cheese, salted meat, nuts, chestnuts, soap, and oranges, but makes no reference to manna.[1]

The earliest actual mention of manna as an Italian drug that I have found, is in the *Compendium Aromatariorum* of Saladinus, printed at Bologna in 1488. Saladinus was physician to one of the Princes of Tarentum in Calabria; neither the date of his birth nor that of his death is known, but it would appear that he was living between A.D. 1442 and 1458; for he states that during his time the King of Arragon punished his druggist at Naples by a fine of 9,000 ducats and degradation from office, because the king's physicians having prescribed *white coral* as an ingredient of a cordial electuary, the druggist not possessing it, substituted *red coral*. This incident affords a clue to the age of Saladinus, for it was Alphonso V., King of Arragon who laid siege to Naples, captured it in 1442, and died in 1458.

Saladinus, 1488.

The work of Saladinus to which I have alluded is a sort of handbook for the *aromatarius* or druggist, and is remarkable for much practical good sense. Besides numerous formulæ and descriptive notices of drugs, it contains a calendar enumerating the herbs, flowers, seeds, roots and gums to be collected in each month;—and in terminating the list for May there occurs the following passage:—

"Collige etiã in isto mẽse mãnã tã in orietẽ qm̃ in Calabria quia tunc ros ille preciosius de celo cadit."

Contemporary with Saladinus lived Giovanni Gioviano Pontano (A.D. 1426—1503), a celebrated historian, statesman, philosopher and poet. Among his numerous writings is a work entitled *Liber Meteororum*, in which there is a poem headed *De Pruinâ et Rore et Mannâ;* this effusion notices in very circumstantial terms the collection of manna by the peasants on

G. G. Pontano.

[1] Pegolotti's work forms the third volume and Da Uzzano's the fourth, of the book published anonymously by Gian Francesco Pagnini under the title of *Della Decima e di varie altre Gravezze Imposte dal Commune di Firenze*, etc., Lisb. e Lucca, 1765-6, 4°, iii. 96; iv. 96-98. Some valuable information on Pegolotti and his writings may be found in Colonel Yule's *Cathay, and the Way Thither*, Lond. 1866. (Hakluyt Society) vol. ii. 279.

the banks of the Crati in Calabria, describing the production of the drug in language which may be rendered thus :— 1869.

. . . There in the middle of summer, under a burning sun, while heat prevails and the cloven earth gapes,—when no breeze is stirring, and the humid air is still, it (the manna) gradually exudes and, condensed as a viscid fluid, runs into drops and thickens on the thirsty leaves,—and further hardened by successive suns, it acquires the appearance of wax and the taste of honey. Such as the bees obtain by their instinctive art and mutual aid, this nature produces for the medicinal use of mankind.

I subjoin the passage in a foot-note.[1]

In the second half of the fifteenth century flourished Raffaele Maffei, called also Volaterranus, a voluminous writer, who among other works has left one entitled *Commentarii Urbani*, in which we find a sentence in the following words :— Raffaele Maffei.

"Manna nostra ætate cœpit in Calabria provenire : licet orientali inferior."

The signification of this I take to be, that manna first began to be collected in Calabria, within the author's recollection, but that it was not considered so good as the eastern manna.

It is to be observed that Saladinus, Pontano and Maffei all speak of manna as a production of Calabria, and it is evident,

[1] Quinetiam Calabris in saltibus, ac per opacum
Labitur ingenti Crathis, qua cœrulus alveo,
Quaque etiam Syriis sylvæ convallibus horrent
Felices sylvæ, quarum de fronde liquescunt
Divini roris latices, quos sedula passim
Turba legit, gratum auxilium languentibus ægris.
Illic æstate in mediâ, sub sole furenti
Dum regnat calor et terræ finduntur hiantes.
* * * * *
Cum nullæ spirant auræ, et silet humidus aer
Contrahitur paulatim, et lento humore coactus
In guttas abit, et foliis sitientibus hærens
Lentescit, rursumque diurno a sole recoctus
Induit et speciem ceræ, mellisque saporem.
Quodque et apes præstant arte, ingenitoque favore
Hoc medicos natura hominum producit in usis.
Pontani Opera, Venet. 1513, *Lib. Meteor.* p. 113.

[2] Volaterranus (Raph.) *Comment. Urban.*, Paris, 1515, fol., lib. 38. f. 413. I have not been able to consult an earlier edition of his works published, it is said, at Rome in 1506.

1869.

I think, that for a long time the drug was afforded by that region and not by Sicily.

Ancient writers on the trade in Manna.

Brasavolus, of Ferrara, describing the drugs found in the shops *circa* A.D. 1537, mentions manna as a production of Calabria.[1]

Matthioli (1548) remarks that of manna he has only seen two sorts—the Levantine and the Calabrian.[2]

Alberti, in his *Descrittione di tutta Italia*, published at Bologna in 1550, mentions manna as found in Calabria.[3]

Garcia d'Orta (1563)[4] and Christopher Acosta (1574)[5] describe different kinds of Oriental manna, contrasting them with that of Calabria.

Still more significant is the fact that Fazelli, a well-known writer on Sicily (1558), in a chapter on the productiveness of the island boasts of its wine, oil, sugar, honey, fruits and saffron, but says not one word of manna or the manna-ash.[6]

Spontaneous exudation.

The manna collected in these early times was undoubtedly that which the trees produced spontaneously, but it was neither abundant nor cheap.[7] That which exuded from the leaves was esteemed the best, and was called *manna di foglia*, or *manna di fronda;* it is described as being in the form of solid, translucent, white grains resembling little grains of mastich, and having a sweet and agreeable taste. The second sort was that which flowed spontaneously from the trunk and branches, and was termed *manna di corpo;* while the third or commonest kind was that picked up from the ground.

New mode of Notching.

Towards the middle of the sixteenth century, it was found that a much more copious supply of manna could be obtained by notching the bark of the tree, and this new method of procuring the drug began to be adopted.[8] But the innovation did

[1] *Examen omnium Simplicium*, Lugd. 1537, 8°, p. 335.
[2] Comment. in Lib. i. Diosc. cap. 70.
[3] P. 198.
[4] *Colloquios dos Simples*, etc., Goa, 1563, 4°, p. 132.
[5] *Tractado de las Drogas y Medicinas de las Indias Orientalis*, Burgos, 1578, 8°, p. 399.
[6] *De Rebus Siculis*, Dec. i. lib. i. ch. 4, *De Ubertate Siciliæ*.
[7] Fiore da Cropani in his *Calabria Illustrata*, Napoli, 1691, says (p. 253) that the *manna di fronda* has been sometimes sold even in Calabria at 50 *scudi* for 6 ounces.
[8] In Bauhin's edition of the Commentaries of Matthioli, published at

1869.

not pass unnoticed, for in the year 1562 Marino Spinelli, being *protomedico* of the kingdom of Naples, set about inquiring as to the article sold by the druggists as manna: and as he doubtless found it no longer corresponded with that of former days, he declared, in concert with other learned physicians, that it was by no means good; and further to enforce his opinion, he procured the issuing of a public edict, prohibiting the druggists under a severe penalty from using any other manna than that of the leaf. This law proved very injurious to the Calabrians; it was felt also to be both severe and unjust by many of the physicians one of whom, Annibal Briganti, took up the question in a philosophical spirit, made many visits to the manna-districts, and investigated the differences alleged to exist between one sort of exudation and another. This resulted in the discovery that manna, whether spontaneously yielded by the leaves or stem, or obtained from the latter by aid of incisions, is essentially the same substance and possesses like virtues. These observations were recorded by Briganti in a long discourse written in Latin, for which, I am sorry to say, he has had very little credit; for not wholly trusting his own judgment on a subject so grave and controversial, he sent his MS. from Chieti, where he lived, to another learned man, Donatus Antonius ab Altomari of Naples, who so entirely approved of it that he immediately published the whole of it in his own name![1] Under the assumed authorship of Altomari we have then this essay as a quarto pamphlet of forty-six pages, printed at Venice in 1562, and entitled, *De Mannæ differentiis ac viribus deque eas dignoscendi via ac ratione;* and as if to give the work greater weight, it is in the form of an epistle addressed to Hieronimus Albertinus, Neapolitan prime minister of Philip II., a monarch whose connection with the English crown and Spanish Armada has caused his name to be well remembered in our annals.

Annibal Briganti.

Literary appropriation.

The custom of promoting the exudation of manna by wounding

Basle in 1574, the practice of making incisions in the bark of the tree is distinctly alluded to as being followed in Apulia and Calabria "*hâc ætate.*"

[1] "*Senza pure un minimo segno di gratitudine.*"—The account of this shameless piracy is related with much moderation by Briganti himself in his Italian edition of Garcia D'Orta, published at Venice in 1582 (p. 50).

1869.

Increased production.

the stem and branches of the trees, must have occasioned a great increase in the production of the drug, a proof of which we have in the statement of Fiore (1691) that the sole district of Campana and Bocchiglioro affords annually 30,000 lbs. with great profit to the gatherers, and 1100 ducats of excise to the government.[1] Of the period when the traffic in manna commenced in Sicily I have no information. Paolo Boccone, of Palermo, mentions in his *Museo di Fisica e di Esperienzie*, which appeared in 1697, several localities in Italy whence manna is obtained, adding that *manna forzata* (that from incisions being thus called) is also produced in Sicily.[2]

Recapitulation.

In conclusion, let me recapitulate the points in the history of manna upon which I have endeavoured to throw light:—

1. That the manna known in Europe in very early times was probably all of Oriental origin.
2. That manna of the ash (*Fraxinus ornus*, L.) began to be collected in Calabria in the first half of the fifteenth century.
3. That the practice of making incisions in the tree in order to promote the exudation was not commenced until about the middle of the sixteenth century, previous to which period the only manna obtained was that which exuded spontaneously.
4. That although the existence in Sicily of a mountain called by the Arabic name *Gibil-manna* would seem to indicate that manna was collected during the period of Mussulman rule in that island (A.D. 827 to A.D. 1070), evidence has not been produced to prove the fact; but that, on the contrary, it appears that manna was gathered in Calabria long anterior to its collection in Sicily. [*N. Repert. f. Pharm.* xix. 98.]

ON CALABRIAN MANNA.

(*Calabrische Manna.*)

(*Read before a Meeting of the British Pharmaceutical Conference at Brighton, August 14th*, 1872.)

1872.

MANNA, it is stated in the *British Pharmacopœia* (1867), is a concrete saccharine exudation from the stem of *Fraxinus*

[1] *Della Calabria Illustrata*, Nap. 1691—1743, fol. p. 253.
[2] Obs. xiv.—xv.

ornus, L., and *F. rotundifolia*, DC., which trees are cultivated for the purpose of yielding it chiefly in Calabria and Sicily. Of the method of collecting manna in Sicily there are tolerably exact accounts ; and the manna plantations of that island have also been fully described.[1] 1872.

Inquiries on the subject.

Having never heard of manna plantations in Calabria, nor seen any modern account of manna-gathering in that region, I wrote in 1868 to my friend Colonel Yule of Palermo to inquire if he could furnish me with any particulars. Colonel Yule being unable to answer my questions, communicated them to Mr. Grant, British Consul at Brindisi, who in his turn sought to obtain the desired information from some of the British Vice-Consuls (Italians) in Calabria. But except the statement that the site of its production was the province of Calabria Citra, and especially the territory of Rossano on the shores of the Gulf of Taranto, I was unable to gain any very precise knowledge on the subject.

Here I may remind you of an investigation into the history of manna which I made in 1869,[2] and that one conclusion to which it led was this,—that manna was collected in Calabria for hundreds of years prior to its being a commercial product of Sicily, and that the earliest accounts of manna-gathering in the latter only date from the second half of the seventeenth century.

Evidence of travellers.

It will be well now to consider some remarks that have been made by travellers regarding manna as an object of industry in Calabria ; though they are only passing allusions, they suffice to show that this drug was at least a well-recognised production of the country in question.

Baron Riedesel, a German nobleman who made an interesting journey through Sicily and Southern Italy about a century ago, and whose travels have been published both in German and English,[3] travelled from Cotrone to Cariati, small towns on the

[1] See in particular a paper by Dr. Cleghorn on the Botany and Agriculture of Malta and Sicily—*Transactions of the Botanical Society of Edinburgh*, vol. x. 1868-69.

[2] *Pharm. Journ.*, xi. (1870) 326.

[3] *Travels through Sicily and that part of Italy formerly called Magna Græcia.* Translated from the German by J. R. Forster, F.R.S., London, 1773.

1872. Cariati.

eastern coast of Calabria. Of the latter he remarks that "it is a bishopric of Calabria. . . . . round which they collect the best manna and in the greatest quantity. The owners of the manna-trees are obliged to sell their manna to the king for a fixed price; the better sort, or what is commonly called *in cannole*, for 2 *carlini* [8*d*.], and the worse, or *in frasca*, for 8 *grani* [3¼*d*] the pound. These revenues are farmed for 32,000 ducats [£5,533] per annum. The greatest quantity is collected about Cariati and Strongoli."

About twenty miles west of Cariati is the small town of Corigliano, where, says the Baron, they also collect "*vast quantities of manna*."

Half a century after this traveller, an Englishman, the Hon. Richard Keppel Craven, made a journey through Calabria, visiting among other places Cariati, the vicinity of which was at that period still famous for manna. The following is from his published journal[1]:—"The mountains near Cariati abound with game, and the forests which richly clothe their summits furnish quantities of that species of ash which produces the manna, a considerable branch of commerce in this province, and more particularly esteemed from this district."

The foregoing notices, scanty as they are, are yet of interest as coming from eye-witnesses, or at least from inquiries on the spot. Let me now add a few observations of my own, the result of a short journey during the present year through a portion of the province of Calabria Citra.

Personal observations.

Florence.

First, when at Florence I inquired for *Calabrian manna*, addressing myself to the principal firm of wholesale druggists in that city. The answer I got was that Calabrian manna was an article they never purchased, but that if I wished to see the drug it was possible, as it so happened that a small keg of it had been sent to them for disposal. Of this offer I availed myself: I found to my surprise that the drug was a soft viscid mass containing small tears, mixed with fragments of leaves, sticks, and dirt,—in fact, I regarded it of such very bad quality

[1] *Tour through the Southern Provinces of the Kingdom of Naples*, London, 1821.

that I declined a sample which was kindly offered me. I thought also that if I travelled into Calabria I should easily obtain much better, as well as all desired particulars respecting the trade in manna, of which, according to the latest edition (1868) of Murray's *Handbook for Southern Italy*, Calabria Citra is the "principal seat." I accordingly proceeded southward. 1872.

Around Florence I may remark, and especially between that city and Pisa, the manna ash (*Fraxinus ornus*, L.) is frequent, being one of the small low trees grown as a support for the vine. Except these examples I hardly saw the tree until I reached the shores of the Gulf of Taranto, when I observed some very tall specimens in the strip of humid forest a little south of Policoro.

Journeying onward I arrived at Rossano, a town in Calabria Citra, of about 10,000 inhabitants, situated three or four miles from the sea. Here I learnt that the manna trees, which are called *Ornelli*, grow on some of the adjacent mountains,—that they are of large size, and are *not* cultivated,—that manna is obtained from them by incisions in the trunk made by the peasants in July and August,—that the manna got is mostly of the soft or fatty kind, very little of it being obtained in long white pieces or *cannoli*, and in some seasons none at all. Rossano. *Ornelli.*

The collecting of manna about Rossano is at present, I was assured, a very small and insignificant branch of industry. Few persons among those from whom I sought information knew anything of the gathering of manna, or even of the existence of the manna-ash in the neighbourhood. One gentleman, a principal inhabitant of the town and holding an official position, to whom I had a letter of introduction, assured me that the incising of the stems of the trees had been since the last four or five years forbidden by the Government; and the same statement was made by others. It is plain, however, that manna *is* still gathered about Rossano though the amount is quite insignificant, for I obtained from a pharmacien in the town a specimen, being part of some he had purchased from a peasant the previous season. Collection in Calabria Citra

1872.

Disuse of Manna at Corigliano.

Hoping for more information, and that I might at least obtain better specimens, I went to Corigliano, a small town, the mountains around which produce, according to Murray's *Handbook*, "the finest manna in Calabria,"—a fact without doubt perfectly true a century ago. Here I was told that no manna is now brought in for sale, the collection having entirely ceased. I called on five pharmaciens in the town: three of them had in stock no manna whatever; the fourth had some which he had purchased in Naples, but the fifth (Signor Giuseppe Guidi) had a box containing a pound or two of manna of the country, of which he kindly gave me a sample. He told me that it was old, none being now collected. This manna is a moist, semifluid, saccharine mass, of a dirty yellowish-grey.

Cosenza.

On the 5th May (1872) I reached Cosenza, the capital of the province, situated at the head of the valley of the Crati, in passing through which I observed a few trees of *Ornus*. The locality was anciently renowned for manna. Here I repeated my inquiries in several pharmacies, but in vain. At length I found one, the proprietor of which showed me some soft manna which he said had been got near Cotrone. I discovered also in another pharmacie manna of two qualities, *scelta*, and *in pasta*, both of which the pharmacien stated he had bought of peasants who had collected it at Rossano. The collecting of manna about Cosenza was quite ignored by most of the persons whom I asked for information. Those who had any aquaintance with the drug declared it was no longer an object of industry in that part of Calabria. One pharmacien asserted that the collection of manna had been prohibited for the last six or seven years.

Messina.

The course of my journey having led me to Messina, I had the pleasure of making the acquaintance of Mr. Robert Sanderson, a merchant of that city of long standing, whose business in Italian produce includes the shipment of manna. On asking this gentleman about Calabrian manna, he informed me he was ignorant of such a commodity; and on my showing him some of the drug in the soft form in which I had procured

it at Cosenza, he expressed much surprise, and declared it to be unlike any Sicilian manna he had seen. 1872.

No specimen of Calabrian manna was contributed to the Italian Exhibition held at Florence in 1861 ; but there appear to have been three samples from Rogliano in the London Exhibition of the following year.[1]

From what I have already stated the conclusion, is I think, irresistible,—that Calabrian manna as an article of commerce has practically ceased to exist, and that the collection of manna in that part of Italy is on the verge of extinction. Commercial Calabrian Manna extinct.

I regret that when at Rossano I was unable to visit the woods of *Ornus*, which undoubtedly exist in that vicinity. But the habits of the Calabrian peasantry are such that it is impossible for travellers to quit the high roads without personal danger.

The better to inform myself of manna-industry, and especially that I might become well-acquainted with the tree, I afterwards paid a visit to the manna plantations of Capaci near Palermo. I also inspected the trees which are cultivated at the *Instituto Agraria Castelnuovo* near that city,[2] and in the park of La Favorita. But as the time of my visit (May 16-22) was not that for collecting the drug, I have no details of particular novelty to communicate. Manna plantations near Palermo.

Respecting the manna-ash itself, however, I wish to say a few words. It has often been stated, as in the *British Pharmacopœia* (for which in this case I presume the *Prodromus* of De Candolle is the authority), that there are two species of manna-ash, namely, *Fraxinus ornus*, L., and *F. rotundifolia*. Many modern writers on pharmacology admit but a single species, *F. ornus*, L., of which *F. rotundifolia* is stated to be a cultivated variety peculiar to Calabria and Sicily, and propagated by grafting. *Fraxinus ornus* and *F. rotundifolia*, B.P.

I do not think either statement satisfactory. *F. ornus* is very variable even in its wild state, and in the same locality.

[1] They were contributed by Signor Giovanni Morrelli of Rogliano, Calabria.

[2] A most interesting agricultural college founded by private munificence, where twenty-two lads are studying scientific and practical husbandry under the able directorship of Professor Inzenga.

1872.

Manna tree cultivated in Sicily.

As to the tree which is cultivated in Sicily, and of which I have examined specimens from all parts of the island,[1] it likewise presents great variations, but no special form that can be singled out as deserving the name *rotundifolia*, or even that can be recognised as *par excellence* a cultivated variety. It is true that the tree in some manna plantations is occasionally grafted, certain trees yielding a poor supply of saccharine matter being thus replaced by others of a more productive nature. But I observed no grafting at Capaci, where the trees are grown like coppice oak in England, and where such a plan of treatment would therefore be hardly worth the trouble.

(The paper was illustrated by several specimens of Calabrian manna procured at Rossano, Corigliano and Cosenza, and by a large suite of botanical specimens of *Fraxinus ornus*, L., and a stem of the latter showing the incisons of manna.) [*N. Repert. f. Pharm.* xxii. 81.]

THE ADULTERATION OF SAFFRON.[2]

(*Mit Kreide erfälschter Safran.*)

1872.

Adulteration.

SAFFRON is at the present time the subject of a serious adulteration, to which I think it important to call attention, the more so as I find that its nature and extent are not fully known even to experienced druggists. Saffron adulterated in the manner I am about to describe, is not for the most part, *undistinguishable to the eye* from the drug in a state of purity, yet the means of discriminating between the genuine and the fraudulent are of the most simple character.

Let me remark at the outset that there is, in my opinion, no method of testing saffron more effectual than that of scattering a very small pinch on the surface of a glass of warm water. The stigma of the saffron-crocus immediately expands, and exhibits

Warm water Test.

[1] Many of them courteously presented to me by Professor Todaro of the Botanical Garden, Palermo.

[2] Since the following paper has been in type, I have received the *American Journal of Pharmacy* for September, in which I find a note by Professor Maisch calling attention to the adulteration which I have here described.—D.H.

1872.

a form so characteristic, that it cannot be confounded with the florets of safflower, marigold or arnica, or with the stamens of crocus itself.

Carbonate of Lime as adulterant.

It was in performing this simple operation that I detected that some saffron which I had just purchased had been treated with a heavy earthy powder, which speedily separated from the lighter stigmata, and fell to the bottom of the glass. Upon collecting and examining this powder I found it to be *carbonate of lime*, which, by some ingenious process of which I am ignorant, had been made to adhere to the thread-like saffron without in the least altering its general appearance.

To ascertain the amount of earthy matter thus fraudulently added, I subjected several specimens of saffron to incineration, each having in the first instance been dried in warm air until it ceased to lose weight. The results obtained in the examination of eight samples are indicated in the following table :—

EXAMINATION OF SAFFRON.

Sample.	Description.	Percentage of Ash.
No. 1	Origin unknown . . . . . *pure*	5·90
,, 2	,, ,, ,,	4·48
,, 3	Valencia . . . . . ,,	4·41
,, 4	,, ... ,,	5·20
,, 5	Alicante . . . . *adulterated*	21·22
,, 6	,, ... ,,	12·72
,, 7	,, ... ,,	28·01
,, 8	,, ... ,,	15·36

Sample No. 2, the quality remarkably fine. Sample No. 3, so-called *Valencia*, pure, but not of finest quality. Sample No. 7, adulteration perceptible to the eye, many of the stamens being crusted with an orange-coloured earthy powder.

Testing for earthy adulteration.

The method of testing a sample of saffron for earthy adulteration which I recommend is this :—Place in a watch-glass a very small quantity (say, 1 grain) of the saffron, and drop upon it 8 or 10 drops of water ; lightly touch the saffron with the tip of the finger, so as to cause the water to wet it. If the drug is free from earthy matter, a *clear*, bright-yellow solution will be immediately obtained ; if adulterated, a white powder will *instantly separate*, causing the water to appear turbid ; and if a

1872. drop of hydrochloric acid be now added, a brisk effervescence will take place.

Saffron almost always contains a few of the pale yellow stamens accidentally gathered; but the pollen from them which is detached when the drug is wetted, but which is minute in quantity, is easily distinguished from carbonate of lime by not dissolving when hydrochloric acid is added. Moreover, the form of pollen-grains may be easily recognised under the microscope. [*N. Repert. f. Pharm.* xix. 664.]

HISTORICAL NOTES ON THE *RADIX GALANGÆ* OF PHARMACY.

(*Zur Geschichte der Galanga.*)

(*Read before the Linnean Society, January* 19, 1871.)

1871. In discovering and describing the plant which yields the *Radix galangæ minoris* of pharmacy, Dr. Hance has added an interesting chapter to the history of a substance which for many centuries has been an object of trade between Europe and the East. Galangal does not, indeed, possess properties which can claim for it the rank of an important medicine, being simply a pungent aromatic of the nature of ginger; but it has so long held a place in the pharmacopœias of Europe, and enters into so many ancient receipts, that I need hardly apologize for offering to the Linnean Society a few notes on its pharmacological history.

Introduction of Galangal. Galangal was apparently unknown to the ancient Greeks and Romans; at least no mention of it can be found in the classical authors. Its introduction into Europe was due to the Arabians, in whose writings it is noticed at a very early period.

Thus Ibn Khurdádbah, an Arab geographer who served under the Khalif Mutammid, A.D. 869-885, has left some information respecting China, after which he speaks of the country of Sila, which exports . . . . . musk, aloes (*i.e.* aloes-wood), camphor, ... porcelain, satin, cinnamon (cassia), and *galangal*.[1]

[1] "*Le Livre des Routes et des Provinces*, par Ibn Khordadbeh, traduit et annoté par C. Barbier de Meynard," *Journ. Asiatique*, sér. vi. tome v. (1865), p. 294.

1871.

The celebrated geographer Edrisi, who wrote A.D. 1154, observes of Aden, that it is the port for Scinde, India, and China, from which last country are brought musk, aloes-wood, pepper, cardamoms, cinnamon, *galangal*, mace, myrobalans, camphor, nutmegs, cloves and cubebs.[1]

The Arabian physicians from Rhazes and Alkindi, in the tenth and eleventh centuries downwards, make frequent reference to galangal as an ingredient of the complicated medicines then in use.

Among the later Greeks I cannot find any mention made of this drug prior to Myrepsus, who probably resided as a physician at the court of the Greek Emperors at Nicæa in the thirteenth century; though several authors declare it is referred to much earlier. It is constantly named by Actuarius, who may have been contemporary with Myrepsus.

Myrepsus and Actuarius.

In a work published some years ago in Paris, entitled *Assises de Jérusalem; ou, Recueil des Ouvrages de Jurisprudence composés pendant le xiii^e^ Siècle dans les Royaumes de Jérusalem et de Chypre*,[2] there is a remarkable list of commodities liable to duty during the twelfth century at the port of Acon in Syria (the modern Akka), at that period a great emporium of Mediterranean trade, in which many Indian spices and drugs, including galangal, are enumerated.

Galangal mentioned in the 13th century.

We find galangal also noticed, together with ginger and zedoary, as productions of India imported into Palestine, by Jaques de Vitri, Bishop of Acon in the early part of the thirteenth century;[3] and in the *Romance of Godefroi de Bouillon*, a poem written in the twelfth century, it is named as one of the rarities of the East, which the Crusaders were deluded into believing would be found in plenty in the Holy Land.[4]

Romance of Godefroi de Bouillon.

Marco Polo, in his travels in Asia in the thirteenth century, observed galangal to be produced in Southern China (Province of Foochow ?), as well as in Java.[5]

Marco Polo.

[1] *Géographie d'Edrisi*, traduit par A. Jaubert; Paris, 1836-40, 4to, tome i. p. 51.

[2] Paris, 1841-43, fol. tome ii. chap. 142.

[3] Vitriaco (Jac. de), *Historia Orientalis et Occidentalis*, 1597, 8vo, p. 172.

[4] *Bibliothèque de l'École des Chartes*, tome ii. 1840-41, p. 437.

[5] *Le Livre de Marco Polo* (éd. Pauthier: Paris, 1865), pp. 522, 561.

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Ancient References to Galangal.

About this period it was also known in Western Europe. St. Hildegard, Abbess of Bingen, who died in A.D. 1179, names it as *galgan*, and comments upon its medicinal virtues.[1]

Galangal is catalogued with other spices (as ginger, cinnamon, cloves, and nutmegs) in the tariff of duties levied in the port of Colibre (Collioure), in Roussillon, in A.D. 1252.[2]

A more interesting notice of the drug is contained in the journal of expenses of John, King of France, from July 1st, 1359 to July 8th, 1360, during his residence in England, preserved in the *Comptes de l'Argenterie des Rois de France.* Besides purchases of sugar, mace, ginger, cloves, pepper, cardamoms, calamus aromaticus, and many other drugs, we find three entries for *galangal,* namely, for ½ lb. 18*d.*, for 2 lb. 6*s.*, and for 1 lb. 22*d.*[3] As the price of gold happens to be also mentioned in one part of the account, it is easy to form an estimate of the relative value of galangal. This shows the price of 3*s.* per pound to be equivalent to 10*s.* of our present money—not extravagant for a commodity transported from the remotest Asia to the centre of England.

Professor Thorold Rogers.

In Professor J. E. Thorold Rogers's *History of Agriculture and Prices in England,* there are eleven entries indicating the price of galangal in England between A.D. 1264 and 1376. The highest was in 1307, when 2 lb. of the spice purchased for the Crown were paid for at the rate of 6*s.* 8*d.* The other entries indicate the price as from 1*s.* 6*d.* to 3*s.* per lb.

In the fifteenth century galangal was evidently in common use; for Saladinus, physician to one of the Princes of Tarentum, *circa* A.D. 1442—1458, reckons it among the things *necessaria et*

[1] *S. Hildegardis Abbatissæ Opera Omnia, accurante J. P. Migne;* Paris, 1855, p. 1134.

[2] Capmany, *Memorias Historicas sobre la Marina, Comercio y Artes de la Ciudad de Barcelona,* 1779, tomo ii. p. 20.

[3] The original entries are as follows :—

"Lundy VII[e] jour d'octobre. Jehan Kelleshulle, espicier à St. Boutoul, pour espices prises de li pour le Roy . . . . Galingal, demie livre 18*d.* Jeudy XIII[e] jour de février . . . . Galingal, 2 livres, 6*s.* Samedy XXVII[e] jour de juing . . . . Berthélemi Mine, espicier . . . . Galingal, une livre, 22*d.* . . . . "

L. Douet D'Arcq, *Comptes de l'Argenterie des Rois de France au XIV[e] siècle.* Paris, 1851, 8vo, pp. 218, 232, 265, 266.

usitata which should be found in the shop of every *aromatarius*.[1] As might be expected, it is included in all the older pharmacopœias and antidotaria. 1871.

Garcia D'Orta, first physician to the Portuguese Viceroy of India at Goa, and a resident in India for thirty years, is, I think, the first writer to point out (1563) that there are two sorts of galangal—the one, as he says, of smaller size and more potent virtues brought from China, the other a thicker and less aromatic rhizome produced in Java.[2] Two kinds of Galangal.

This distinction is perfectly correct. The greater galangal, which is termed *Radix galangæ majoris*, is yielded by *Alpinia galanga*, Willd. a plant of Java;[3] the lesser, called *Radix galangæ minoris*, or simply *Radix galangæ*, is derived, as we now know, from the plant which Dr. Hance has described as *A. officinarum*. It is the latter drug alone that is at present found in European commerce.[4] *Major* and *Minor*.

The name *galangal, galanga*, or *garingal, Galgant* in German, is derived from the Arabic *khalanjān;* whether the word may be a corruption of the Chinese name *liang-kiang*, signifying *mild ginger*, I must leave it to others to decide. Arabic Name.

Let me say a few words regarding the uses of galangal. As a medicine, the manifold virtues formerly ascribed to it must be ignored; the drug is an aromatic stimulant, and might take the place of ginger, as indeed it does in some countries. That it is still in use in Europe is evident from the exports from China and from the considerable parcels offered in the public drug sales of London.[5] The chief consumption, however, is Uses.

[1] *Compendium Aromatariorum;* Bonon. 1488, fol.

[2] *Colloquios dos Simples e Drogas he cousas Medicinais da India;* Goa, 1563, Colloquio 24.

[3] *Maranta galanga*, Linn. Sp. Pl. and Swartz, *Obs. Bot.*

[4] Moodeen Sheriff, in his learned *Supplement to the Pharmacopœia of India* (Madras, 1869), states that in the bazaars of Hyderabad and in some other parts of India the rhizome of *Alpinia calcarata*, Rosc., is sold as a sort of galangal; and that a species of *Alpinia* growing in gardens about Madras, which, conceiving it to be new to science, he has described and named as *A. Khulinjan*, has a rhizome much resembling the lesser galangal of China.

[5] Three hundred bags, each 112 lb., imported from Whampoa were offered for sale by Messrs. Lewis and Peat, 27 Oct., 1870. The quantity was not thought remarkable; and I am assured that a single buyer will sometimes purchase such a lot at one time for shipment to the continent.

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Nastoika.

not in England, but in Russia.[1] It is there used for a variety of purposes, as for flavouring the liqueur called *nastoika*. The drug is also employed by brewers, and to impart a pungent flavour to vinegar, a use noticed by Pomet[2] so long ago as 1694. As a popular medicine and spice, it is much sold in Livonia, Esthonia, and in Central Russia; and by the Tartars it is taken with tea. It is also in requisition in Russia as a cattle medicine; and all over Europe there is a small consumption of it in regular medicine.

There is doubtless some quantity of galangal of both sorts used in India. By a *Report on the External Commerce of the Presidency of Bombay for the year* 1865-66 I find that there was imported into the Port of Bombay of "*Gallingall*" from China 520 cwt., from Penang, Singapore, the Straits of Malacca, and Siam 70 cwt., and from Ports in Malabar 834 cwt. Of the total quantity (1424 cwt.), 716 cwt. was reshipped to the Arabian and Persian Gulfs.

According to Rondot, writing in 1848, the trade in this drug is on the decline;[3] and the statistics which I have examined tend strongly to show that this is the fact.

The foregoing notes may be thus summarized:—

Historical Summary.

1. Galangal was noticed by the Arab geographer Ibn Khurdádbah in the ninth century as a production of the region which exports musk, camphor, and aloes-wood.

2. It is used by the Arabians and later Greek physicians, and was known in Northern Europe in the twelfth century.

3. It was imported during the thirteenth century with other Eastern spices by way of Aden, the Red Sea, and Egypt, to Akka, in Syria, whence it was carried to other ports of the Mediterranean.

4. Two forms of the drug were noticed by Garcia d'Orta in 1563; these are still found in commerce, and are derived

[1] Professor Regel, of St. Petersburg, and A. v. Bunge, of Dorpat, and Mr. Justus Eck, of London, have all obligingly supplied me with information as to the use of galangal in Russia. My thanks are also due to my friend Professor Flückiger, who on this, as on other occasions, has kindly offered me valuable suggestions.

[2] *Histoire des Drogues*, Paris, 1694, fol., part 1, p. 64.

[3] *Commerce d'Exportation de la Chine;* Paris, 1848, p. 98.

respectively from *Alpinia galanga*, Willd., and *A. officinarum*, Hance. 1871.

5. Galangal is still used throughout Europe, but is consumed most largely in Russia. It is also used in India, and is shipped to ports in the Persian Gulf and Red Sea. [*N. Repert. f. Pharm.* xx. 586.]

AFRICAN AMMONIACUM.

(*Africanisches Ammoniak-Gummiharz*, von *Ferula Tingitana*, L.)

1873.

The first writer to mention Ammoniacum is said to be Dioscorides,[1] who flourished in the first century, and who relates that the drug is the juice of a species of *Ferula* growing about Cyrene in Libya, and that it is produced near the temple of Ammon. Whether the drug received its designation from the deity or the deity from the drug, or whether both took their names from the Greek word Ἄμμος, *sand*, in allusion to the parched and sandy desert where both were found, were open questions in the time of Pliny. The story, however, of the Libyan origin of ammoniacum remained current for centuries among writers on Materia Medica, and considering that the drug was not frequently brought from Alexandria, it had about it nothing improbable.

Dioscorides.

Origin of the Name.

Chardin, who passed many years in Persia (1666-1677), is probably one of the first to point out that ammoniacum is a production of that country.[2] He says that the Persians call the plant *Ouchag*, and that it grows in abundance on the southern confines of Parthia,—that is to say south of Ispahan, which is exactly where it has been found by many travellers in modern times.

Chardin.

Jackson, an English merchant who resided for sixteen years in Morocco and wrote an instructive account of that country,[3] described a sort of ammoniacum produced there by a giant fennel called in Arabic *Feshook*. This plant, he says, grows on most of the plains of the interior, but especially about El Araiche

Feshook.

[1] Lib. iii. c. 88.

[2] *Voyage du Chevalier Chardin en Perse*, nouvelle édition, par Langlès, Paris, iii. (1811) 298.

[3] *Account of the Empire of Morocco*, Lond., 1809.

1873.

and M'Sharrah Rummellah. The gum exudes from the stem in consequence of the puncture of [a beetle, and falling to the ground becomes contaminated with earth, for which reason it does not suit the London market; but it is used in all parts of the country for cataplasms and fumigations.

Lindley, from the examination of specimens sent to England from Tangier in 1839, determined the plant affording African ammoniacum to be the *Ferula tingitana* of Linnæus.[1]

Ferula tingitana, L.

Notwithstanding the statement of Jackson, that a kind of ammoniacum is a production of Morocco, it was difficult to believe that this Moroccan drug could be the *Ammoniacum* which the ancients, and especially Dioscorides, described as brought from Libya. Pereira[2] and Guibourt[3] having examined specimens of the gum sent to Lindley from Tangier, concurred in regarding it as a very different substance from Persian ammoniacum. The latter writer even maintained that Dioscorides had slipped into an error, and that his ammoniacum was probably none other than that of our own times.

Doubts respecting name.

It was also pointed out that the word *ammoniacum* was sometimes written *armoniacum*, which might well be a corruption of *armeniacum*, and point to Armenia or some country beyond as the source of the drug.

The works of a Persian writer[4] recently made accessible have also proved that ammoniacum was a production of Persia as early as the tenth century.

The appearance in London drug sales of a very impure kind of ammoniacum, differing notably from the worst variety of the Persian drug, attracted my attention so long ago as 1857; and I was interested in observing a much larger quantity of the same article in the year 1871. On this occasion 37 packages were offered for sale. I was unable to ascertain whence they had been shipped, but the former lot (1857) I found had been imported from Mogador.

Mogador.

[1] Pereira, *Elem. of Mat. Med.* ii., part 2 (1853) 1715.
[2] Op. cit. [3] *Hist. des Drogues*, iii. (1850) 226.
[4] Abu Mansur Mowafik ben Ali, *Liber Fundamentorum Pharmacologiæ*, ed. Seligmann, 1833.

1873.

Description of African Ammoniacum.

The drug may be described as in large, compact, dark, heavy masses, formed of agglutinated tears of a gum-resin of hard, waxy consistence. The tears are opaque, white, and milk-like, or of a pale greenish yellow, or of a fawn colour, mixed with others of a dark blackish brown, which with earthy and vegetable impurities constitute a large proportion of the mass. The drug has a very weak odour not suggestive of ammoniacum, and a slightly acrid but very persistent taste.

Mr. Moryoseph.

Having recently had to investigate anew the history of ammoniacum, I was led to look into the various memoirs on the subject, and also to search for some information respecting the Morocco drug described by Jackson. In the latter inquiry I was fortunate enough to have the aid of Mr. Moryoseph, a drug merchant of London having connections with Mogador, who not only at once supplied me with a sample of the African drug according exactly with that I had noticed in the brokers' sale-rooms, but also kindly wrote to Morocco for some of better quality, which proved to be less impure and to contain milky tears exactly like Persian ammoniacum.

Dr. Leared's account.

I also enlisted the services of my friend Dr. Leared, who during a short visit to Morocco in the past autumn ascertained a few interesting particulars, which are to this effect :—

The plant is called *kelth*, and grows up rapidly after the first rains. Its gum is not much shipped to Europe, but a great deal of it is taken by pilgrims to Egypt and Mecca, where it is used as incense. Its chief shipping-port is Mazagan; a little is sent from Mogador, but none from other ports. The *Greatham Hall*, the vessel in which Dr. Leared embarked, took on board 25 serons of the gum at Mazagan for Gibraltar, where they were to be reshipped for Alexandria. The shippers call it *Fasoy*.

The facts I have narrated show that African ammoniacum is still an object of commerce, and that it is consumed not only in Morocco, but that it finds its way even to Egypt and Arabia. It can hardly be doubted that this traffic is very ancient. Nor is there, as it seems to me, any improbability in assuming that the ammoniacum which the ancients describe as brought from Libya (under which name the whole of Northern Africa west-

1873. ward of Egypt was included) is identical with that still collected in Morocco. That this Morocco drug resembles the Persian or ordinary kind is evident from the fact that London drug brokers have classed it as *ammoniacum* in their catalogues,—and it is probable enough that the two drugs were confounded together at a very early period.

The Morocco gum-resin is used in fumigation; it is worthy of note that the ammoniacum spoken of by Celsus, Galen, Oribasius, Alexander Trallianus, Paulus Ægineta and Actuarius, that is to say by the Greek and Roman physicians who lived between the first and thirteenth centuries, is frequently described as *thymiama* or *suffimen, i.e.*, an incense, or something used for fumigation.

Thymiama vel suffimen.

THE BOTANICAL ORIGIN AND COUNTRY OF MYRRH.[1]

(*Heimat und Abstammung der Myrrh.*)

1873. THE remarks relative to myrrh in the *Admiralty Manual of Scientific Inquiry*, 1859 and 1871,[2] having elicited no information, it may tend to stimulate those who are located in positions favourable for research if the state of our knowledge on the subject is briefly explained. The direction in which investigations should be made will thus become more apparent.

Botanical origin.

Myrrh is a gum-resin, exuding from the stem of a small tree or shrub which is a native of the hot and dry countries around the southern extremity of the Red Sea. Though the substance itself has been known to mankind from the remotest period of history, and though it has been among the most precious articles of ancient commerce, the tree which affords it is almost—perhaps altogether—unknown to botanists. Whether the myrrh-tree belongs to a single species is doubtful; it is more probable that the drug is furnished by two or three distinct but allied species.

[1] Reprinted from *Ocean Highways*, for April, 1873.
[2] *Vide Pharm. Journ.*, i. (1863), 217; ii. (1871), 205.

1873.

Ehrenberg's account.

Let us now consider what has been ascertained on the subject. In 1820-26, the German traveller Ehrenberg visited the countries bordering the Red Sea, and among other places, Ghizan (Jhizan or Jezan), a town or village lying on the Arabian coast in latitude 16° 40′ N., opposite to the group of islands called the Farsan Archipelago,—that is to say, about 300 miles north of the straits of Bab-el-Mandeb. Here, and on the neighbouring mountains of Djara and Kara (which I do not find on any map I have been able to consult), he discovered myrrh-trees, forming, as he says, the underwood of a forest of *Acacia*, *Moringa*, and *Euphorbia*. From these myrrh-trees, he states, he picked some very fine myrrh. He also obtained herbarium specimens, which the botanist Nees von Esenbeck described under the name of *Balsamodendron Myrrha*,—thus, as it would seem, completely settling the question.



Balsamodendron myrrha (after N. v. Esenbeck.)

Dr. Berg's account.

A few years ago Ehrenberg's herbarium was incorporated in the Royal Herbarium of Berlin, and these myrrh-tree specimens were re-examined by Dr. Otto Berg, with results which doubtless occasioned him some surprise. He found, in fact, that Ehrenberg's Arabian myrrh-tree comprised two very distinct plants, namely, that figured by Von Esenbeck, and another to which was attached (*correctly*, let us hope) Ehrenberg's own tickets, stating that from it he had got myrrh. Berg gave the new myrrh-tree the name of *B. Ehrenbergianum*.

Whether myrrh is collected from both we do not know. Ehrenberg himself does not assert that the natives about Ghizan

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collected myrrh at all; and the myrrh of commerce is certainly not brought from that neighbourhood.

Vaughan's account of Aden myrrh.

Whence, then, is myrrh brought? Vaughan, who was port-surgeon at Aden in 1852, says that a little is obtained on the south coast of Arabia, about 40 miles to the east of Aden. But this Arabian myrrh, of which I have seen samples, has not (although pure and clean) exactly the characters of true myrrh, and there is good reason to believe it the produce of another species than that affording the latter. However this may be, the Aden myrrh-tree is wholly unknown to botanists. Vaughan further pointed out that myrrh, which is more commonly known at Aden by its Indian name of *Hera-ból* than by its Arabic designation of *Mur*, is collected in great quantities by the Somali tribes occupying the country between Zeila and Cape Gardafui; and that it is also brought from Harar (otherwise called Hurrur or Adari), a commercial town of the interior, about 175 miles south-west of Zeila. Harar was visited in 1855 by Burton, who describes it as the "great half-way house" for the produce of Efát, Gurague, and the Galla countries. The drug arrives at the great fair of Berbera held in November, December, and January, and is brought up by the Banians of India for shipment to Aden and Bombay.



B. Ehrenbergianum (after Berg).

Cruttenden.

Cruttenden, who visited the Somali coast in 1843, and was afterwards assistant political agent at Aden, says myrrh is brought from the Wadi Nogál, a valley debouching into the Indian Ocean, south of Cape Gardafui, in about latitude 8° N., and from its bordering districts of Ogahden, Murreyhan, and Agahora. He says further that the mountains at the back of Bender Mirayeh (a town about 20 miles south-west of Ras Filek, on the Somali Coast) afford it, and that the drug is brought to Bender Mirayeh for sale.[1]

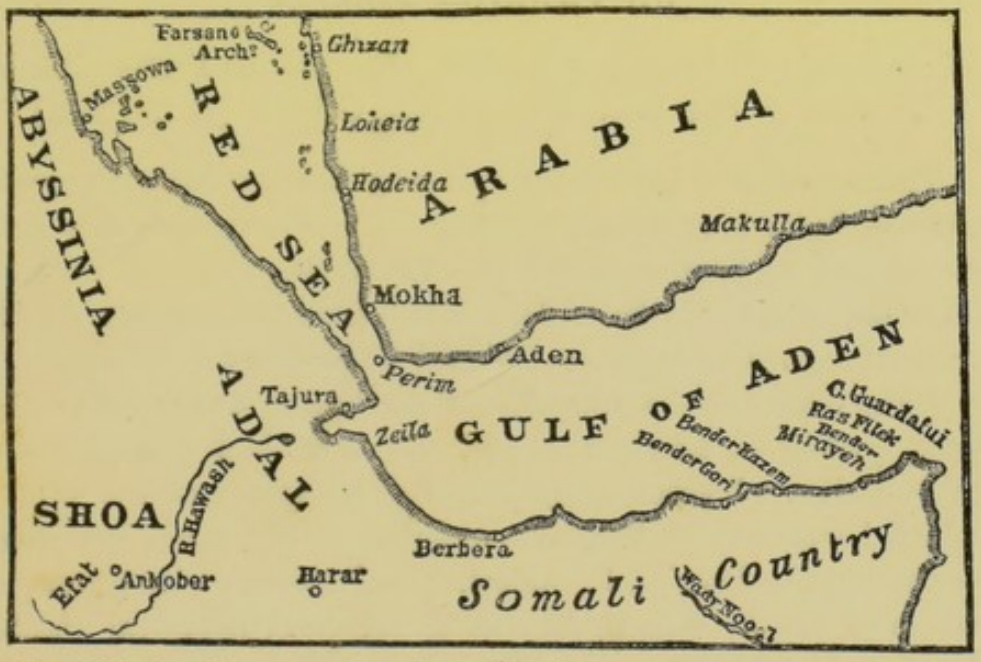
[1] *Journal of Royal Geographical Society*, xix. (1849), 5, 66.

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Whether it is *true myrrh* which is produced in these districts of the Somali country, or whether it is another kind of myrrh called by the Arabs *Bisa-ból*, and which is chiefly consumed in India and China, is an open question.

Sir W. C. Harris.

Again, it has been stated on very good authority, that myrrh is produced in the country lying between Tajúra and Shoa. Sir W. Cornwallis Harris, who was chief of a mission to the latter country in 1841, found the myrrh-tree between Waramilli and Nága Koomi, that is, about 200 miles from Tajúra, on the road to Ankober, the capital of Shoa. In an appendix to his narrative, he names as localities for the plant the Adal desert, the jungle of the Háwash, and the borders of Efát.



Four supposed sources.

It will thus be seen that four districts are asserted to produce myrrh, namely—1, the country about Ghizan, on the eastern shore of the Red Sea; 2, the southern Arabian coast eastward of Aden; 3, the Somali country south and west of Cape Gardafui; and 4, the region lying between Tajúra and Shoa, including Harar to the south-east.

Furthermore, there are certainly three varieties of myrrh, which may well be derived from as many distinct species of myrrh-tree.

What are required for the botanical elucidation of the origin

1873. of myrrh are numerous, well-preserved, pressed and dried specimens of the tree, which ought to include, in addition to foliage, the flowers and fruits; specimens of the exudation of the tree should also be collected, in order that competent persons may pronounce whether it is true myrrh or not. Information as to the collection of the drug in any one of the localities named could not fail to be of interest.

The myrrh-trees appear to be of low stature and unattractive aspect, rigid, often spiny, with scanty foliage, minute flowers and small, oval, dry berries. [*N. Repert. f. Pharm.* xxii. 624.]

ON PAREIRA BRAVA.

(*Translated with Comments (with the Original Illustrations) in the Journal de Pharmacie et de Chimie*, Octobre (1875), 282.)

1873. The botanical origin of the various stems and roots known as *Pareira brava* is extremely obscure. By most writers the drug is referred without question to *Cissampelos Pareira*, Linn., a climbing plant of the order *Menispermaceæ* growing in the tropical regions of both the Old and New World.

Some years ago the difficulty of purchasing Pareira Brava of good quality in London induced me to seek a supply in the West Indies. I accordingly procured on behalf of the firm of which I was then a member, a quantity of the stems and roots of *Cissampelos Pareira*, L., collected in Jamaica under the supervision of Mr. N. Wilson, director of the Bath Botanical Garden in that island. The first importation was accompanied by herbarium specimens of the plant, the examination of which removed all doubts as to its origin. I also obtained specimens of stems of *Cissampelos Pareira* similarly authenticated, from correspondents in Trinidad, Brazil and Ceylon.

Cissampelos Pareira.

From these materials it at once became evident that the long-accepted statement that Pareira Brava is derived from *Cissampelos Pareira*, Linn., was erroneous.[1] In fact neither the stem nor

[1] This fact was first pointed out in the *Pharmacopœia of India*, 1868, p. 8, *note*.

the root of the plant at all resembles any of the forms of that drug I had ever met with in commerce. 1873.

What then is true Pareira Brava ?—To answer this question we must look back to the early history of the drug.

Piso, the Dutch traveller.

The merit of having first given some account of Pareira Brava is usually conceded to the Dutch traveller Piso, who in his work *De Medicina Brasiliensi*, published in 1648, described a plant called by the Portuguese *Caapeba Cipó de Cobras* or *Herva de Nossa Senhora*. Piso's figure is scarcely recognizable, but his description of the fruit as resembling the catkins of hop (*semen magnum coloris rosacei, e capsulis lupulo similibus prominens*) applies well enough to a *Cissampelos*, and in fact *C. glaberrima*, St. Hil., is known under these Portuguese names in Southern Brazil at the present time. My friend Mr. J. Correa de Mello, of Campinas, Prov. S. Paulo, has been good enough to send me a specimen of this plant and of its root; and the latter I find to be wholly unlike any sort of Pareira Brava.

That Piso does not mention Pareira Brava was indeed remarked as long ago as 1710;[1] and it is only since the drug has been supposed to be derived from *Cissampelos* that authors have identified it with Piso's *Caapeba*.

Introduction into Europe.

Pareira Brava was certainly first brought to Europe by the Portuguese. It first attracted general attention in 1688, when Michel Amelot, Marquis de Gournay, a privy councillor of Louis XIV., and a very distinguished political personage, brought it with him from Lisbon whither he had been sent as ambassador by the French king. There can be no doubt that the drug was considered to possess extraordinary properties. Rouillé, the successor of Amelot in the Lisbon embassy, also took home with him to Paris some Pareira Brava; and in 1710 we find it claiming the notice of the French Academy,[2] who requested Etienne-François Geoffroy, Professor of Medicine and Pharmacy in the College of France, to investigate its virtues. Jean-Claude-Adrien Helvetius, a physician of great merit, who though a young man was consulted by Louis XIV., in his last days, and was afterwards

[1] *Hist. de l'Acad. Royale des Sciences, année* 1710, 56.
[2] *Ibid.*

1873. attached to the court of Louis XV., tried the new drug still earlier,[1] and gave strong testimony in its favour.

Sir Hans Sloane. Both Geoffroy and Helvetius were correspondents of Sir Hans Sloane, that diligent promoter of science, whose immense collections gave origin to the British Museum,—and among the Sloanian MSS. I have found a letter of Helvetius's[2] addressed in 1715 to Monsieur Duyvenvoorde, ambassador from the States General to George I., a portion of which I will here quote :—

"I am extreamly pleased s^r that you have apply'd yorself to me for my advice about the use of the *Pareira brava* which has been recomended to you, because I can give you a very good account of it haveing been one of the first that introduced it in France. I have made abundance of lucky experiments about it which have made this medicine very well known to me, wherefore I assure you, you can do nothing better than to make tryall of it. . . The Pareira Brava is a root which comes to us from Brazil by the way of Lisbon, but which the war has rendred pretty scarce ; however it is to be found among the good druggists and is sold [at] Paris for 40 livres the pound. 'Tis called in Brazill the Universall Medicine, and made use of there in all kinds of distempers. A Capuchin monk who came from thence told me he could not give it a greater character than by assuring me that in all their voyages they carried the gospell in one pockett and the Pareira Brava in another. . . . "

Helvetius. Helvetius recommended the finely-powdered root in five grain doses, to be taken in infusion warm like tea.

Petiver. Petiver, apothecary of London, and secretary to the Royal Society, an active collector of objects of natural history of every kind, whose letters are also in the Sloanian collection, thus wrote, December, 11th, 1716, to Colonel Worsley, His Majesty's envoy at Lisbon :—

". . . I am glad to hear y^e Brasil ffleet is safely arrived, w^ch I hope has brought some materialls for my succeeding *Collectaneas*, and amongst them nothing can be more welcome than specimens of y^e leaves and fruit of y^e Ipecacuanha, Pareira

[1] Helvetius, *Traité des Maladies les plus Fréquentes et des Remèdes spécifiques pour les Guérir*, Paris, 1703, 98.

[2] Sloane MS., No. 3340, p. 291.—The letter has already been published in *Phil. Trans.*, No. 346, Nov. and Dec., 1715, p. 365.

Brava, Balsam Capevæ and y^e^ true Brasile and Brasiletto woods, all which will be very acceptable discoveries. . . . "[1] 1873.

The first author to give an account in print of Pareira Brava seems to be Pomet, whose *Histoire des Drogues* was completed in 1692.[2] He describes the drug as then recently seen in Paris, and he figures the specimen given him by Tournefort. Pomet.

Geoffroy, in his excellent *Tractatus de Materia Medica*,[3] a work he did not live to complete, calls the drug by its Brazilian name of *Butua*, or *Pareira Brava* of the Portuguese, and describes it as a root, woody, hard, contorted, externally of dark colour, rough, with many wrinkles, some long, some running round it transversely, like that of *Thymelæa* (*Daphne gnidium*, L.), internally of a dull, yellowish hue, knit together, as it were, with many woody fibres, so that when cut transversely it exhibits several concentric circles, intersected by numerous rays of fibres passing from the centre to the circumference; inodorous, somewhat bitter, with a certain degree of sweetness like liquorice, as thick as the finger, or sometimes as a child's arm. He adds that the Brazilians and Portuguese most highly extol its virtues as a diuretic, lithontriptic, vulnerary, stomachic, cordial, and alexipharmic,[4] and in fact, regard it as a complete panacea. Geoffroy.

The question now arises, Can the drug which was introduced with so much of laudation be clearly identified? Question of Identification.

As already stated, Pomet has figured it, and his engraving is excellent. But Sloane has left us better materials. In his

[1] Sloane MS., 3340, p. 306.

[2] As proved by the letters of approbation which preceded it. But it was not published until 1694.

[3] Tom. ii. (1741) 21.

[4] Hill judiciously remarks that this is going too far in its praise, and yet omitting some of its real virtues. "It is certainly a diuretic," says he, "of no inferior kind, and has done great service in nephritic cases; and in pleurisies and in quinsies has been attended with more success than almost any medicine we know of singly. In suppressions of urine scarce anything is more efficacious or more instantaneous in its effect, but it is folly to infer from this that it will dissolve the stone. . . . . In cases of ulceration of the kidneys or bladder, when the urine is purulent and voided with great difficulty, there is scarce anything equal to this root as a remedy."—*Hist. of Mat. Med.* 1751, p. 600.

1873. collection of Materia Medica, now in the British Museum, there are many well-preserved specimens of the drug obtained from different persons and at different periods, *and all of one kind;* and in his voluminous manuscript catalogues and his other papers are entries throwing light on their origin.

The first notice I have found is a letter from Lisbon, dated
A.D. 1699. October 17th, 1699, addressed by Joseph Geston to John Ellis,[1] in which the writer says:—

"By order of my brother, W^m. Geston, I send you here inclosed six sticks of *Pareira Brava* or *Parra Brava*. The use of it, I am informed, is in powder, one scruple, and to the strongest patient one octave [drachm] in Rhenish wine. . . . Its vertues are for the stone, gravell, obstruction of the urine, and for the colick,—a very excellent remedy."

Though this letter is not addressed to Sloane, nor is he mentioned in it, yet from its occurrence among his correspondence there can be no doubt that the specimens to which it relates were intended for him.

The entries in his manuscript catalogues, which are in his own handwriting, are these:—

Sloane Manuscript. "652. *Pareira Brava.*—From Brasile, pretended to be good for the stone"

"4039. *Pareira Brava.*—A root used in the stone."

"6708. The *Pareira Brava*, of a brown colour, from Brazil, said to be the best sort.—From Mons^r. Geoffroy.

10471. Sev^ll. specimens of the *Pareira Brava*, from Lisbon, accounted a great remedy in suppression of water and the stone,—according to Mons^r. Geoffroy, the *Ambitua* or *Butua* of Zanoni.—From Dr. Fuller, Sevenoaks."

In 1866, I applied to my friend Theodor Peckolt, druggist, of Rio de Janeiro, then residing at Cantagallo in the same province, on the subject of Pareira Brava, in consequence of which I received from him specimens of two plants, the one marked *Butua* or *Pareira Brava legitima*, and other *Butinha* or *Pareira Brava miuda* (literally *small Pareira Brava*), together with a large dried entire plant of the former. The herbarium specimens of these plants presented no characters by which I could

[1] Sloane MS., 4045, fol. 240.

1873.

distinguish them as two species; and Mr. Peckolt subsequently informed me that their difference consists chiefly *in habit*, and that the first or *legitimate* Pereira Brava is found in much drier situations than the small sort or *Pereira Brava miuda*. Mr. Peckolt.

I have also received specimens from my friend Mr. J. Correa de Méllo of Campinas, marked *Parreira Brava pequena* (*small Pareira Brava*) or *Abuta pequena*, and others labelled *Leaves of the plant producing Pareira Brava*, all of which seem referable to Mr. Peckolt's plant. Mr. Correa de Méllo has likewise sent me the dried root, and I have also received the root as supplied by a drug house of Rio de Janeiro. M. Correa de Méllo.

Within the last few weeks two specimens of roots bearing some leaves marked respectively *Pareira Brava, large leaf*, and *Pareira Brava, small leaf*, have been presented to the Pharmaceutical Society as well as to myself by Mr. G. B. Francis of the firm of Hearon, Squire, and Francis. Between these two sorts I fail to recognize any difference. Mr. G. B. Francis.

The roots of Mr. Peckolt's *Pareira Brava legitima*, those sent me by Mr. Correa de Méllo, and those received from Mr. Francis, completely agree with Sloane's specimens, as well as with Pomet's figure.

As to the plant, I identify it with *Chondodendron*[1] *tomentosum* of Ruiz et Pavon, with an authentic specimen of which in the herbarium of the British Museum I have compared it. It is the *Cocculus Chondodendron* of De Candolle (Prod. i. 98), and has been figured as *Cocculus* (*?*) *platyphylla* by Auguste de St. Hilaire,[2] and by Eichler,[3] as *Botryopsis platyphylla*, Miers. It agrees well with the plate of *Cissampelos Abutua* in Vellozo's *Flora Fluminensis*[4] with which Eichler doubtfully identifies it. *Chondodendron tomentosum.*

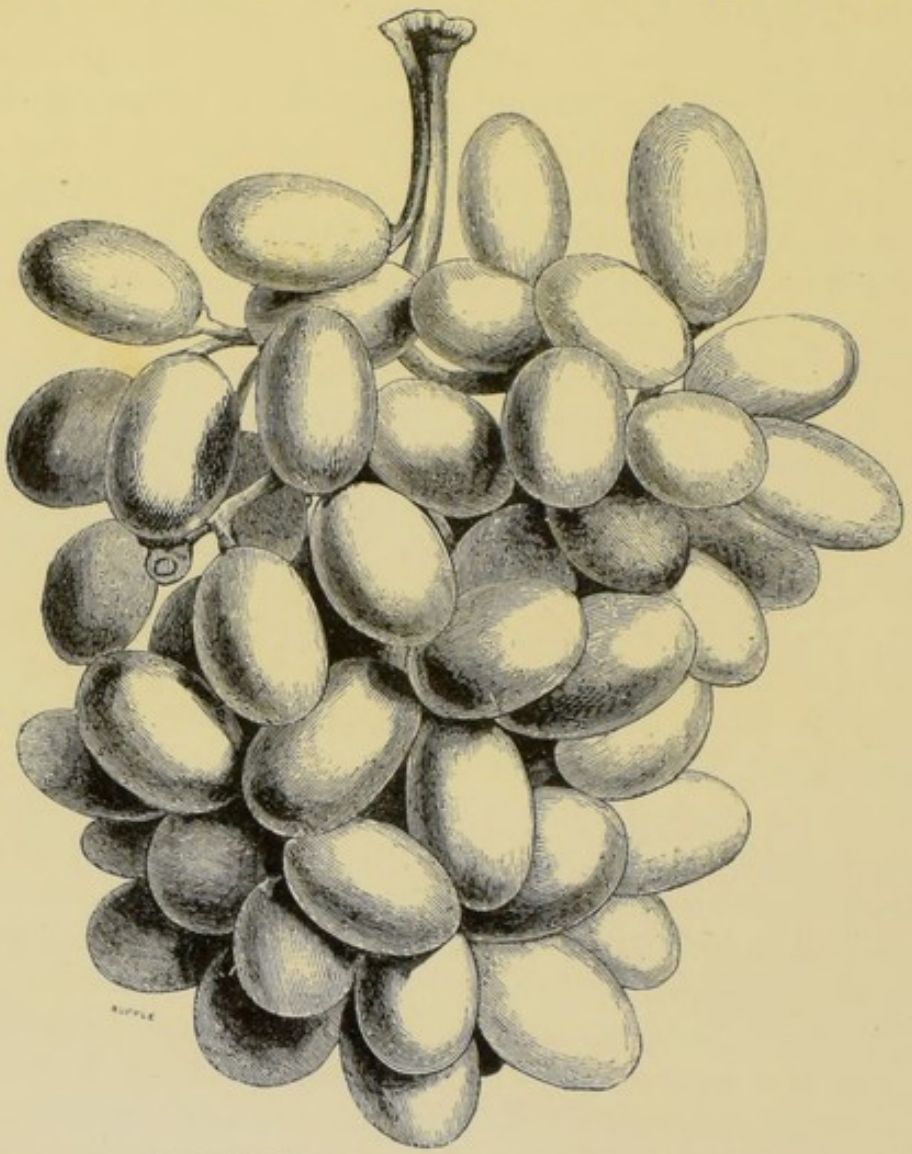
[1] Mr. Miers (*Contributions to Botany*, iii. 307) contends for this name being written *Chondrodendron* as more in accordance with its derivation from χόνδρος. But I think it safer to retain the original spelling as accepted by all botanists.

[2] *Plantes Usuelles des Brasiliens*, pl. 42.

[3] Martius *Flor. Bras.*, fasc. 38, tab. 48, Eichler makes *two* species under the name of *Botryopsis*, Miers *eight*, six of them being apparently forms of *Ch. tomentosum*. Mr. Miers's species, as named by himself, can be seen in the British Museum, and a type-specimen of the plant figured by Eichler in the Kew Herbarium.

[4] Tom. x., tab. 140. Mr. Miers regards this to represent his *Abuta macrophylla*, a very different plant.

1873. *Chondodendron tomentosum* has been found in various parts of Brazil, where it is known as *Butua* and *Abutua*. Its raceme of large oval berries, exactly like a bunch of grapes, is another



Bunch of Fruits of *Chondodendron tomentosum*. R. ET P.[1]

evidence that it is the plant which the old Portuguese colonists called *Pareira Brava* or *Wild Vine*.[2] Neither the fruit nor the foliage of *Cissampelos Pareira* have anything about them suggestive of a grape vine.

[1] From a specimen preserved in alcohol, sent to me by Mr. Peckolt.

[2] In Portuguese the word is written *Parreira*, and signifies a vine that grows against a wall or over an arbour. *Párra* is a vine-leaf.

1873.

The root of *Chondodendron* cannot be confounded with the stem, which is woody and fibrous and of a different structure. Geoffroy's description of the former, which I have translated at page 385 is correct so far as it goes. I may add that the numerous specimens I have seen present but little variation. All are portions of a tortuous, branching root, wrinkled longitudinally and having transverse fissures, constrictions, or ridges. The root is externally of a blackish-brown, and light yellowish-brown within. In Mr. Francis's drug there are young roots having the remnants of green aërial stems rising from their upper part. In Mr. Peckolt's specimen the aërial stems are fully preserved, as thick as the finger and many feet in length. The root seems to be gorged with juices, so that under the penknife it cuts more like a very hard fat or wax than as a fibrous wood. In transverse section it does not display zones of the same regular and beautiful definition that one sees in ordinary Pareira Brava. In the root of Chondodendron there is a large well-marked central column composed of wedges diverging from a common axis, around which are arranged a few concentric rings intersected by wedge-shaped rays which are often irregular, scattered, and indistinct. The axis is not often eccentric.

Description of the root of *Chondodendron.*

In *Cissampelos Pareira* the root and stem are nearly alike in structure, and in transverse section show no concentric rings. Those received from Jamaica, which were the largest that could be collected, were rarely so much as an inch in diameter, and in many localities it is difficult to obtain the stem or root thicker than a goose quill.

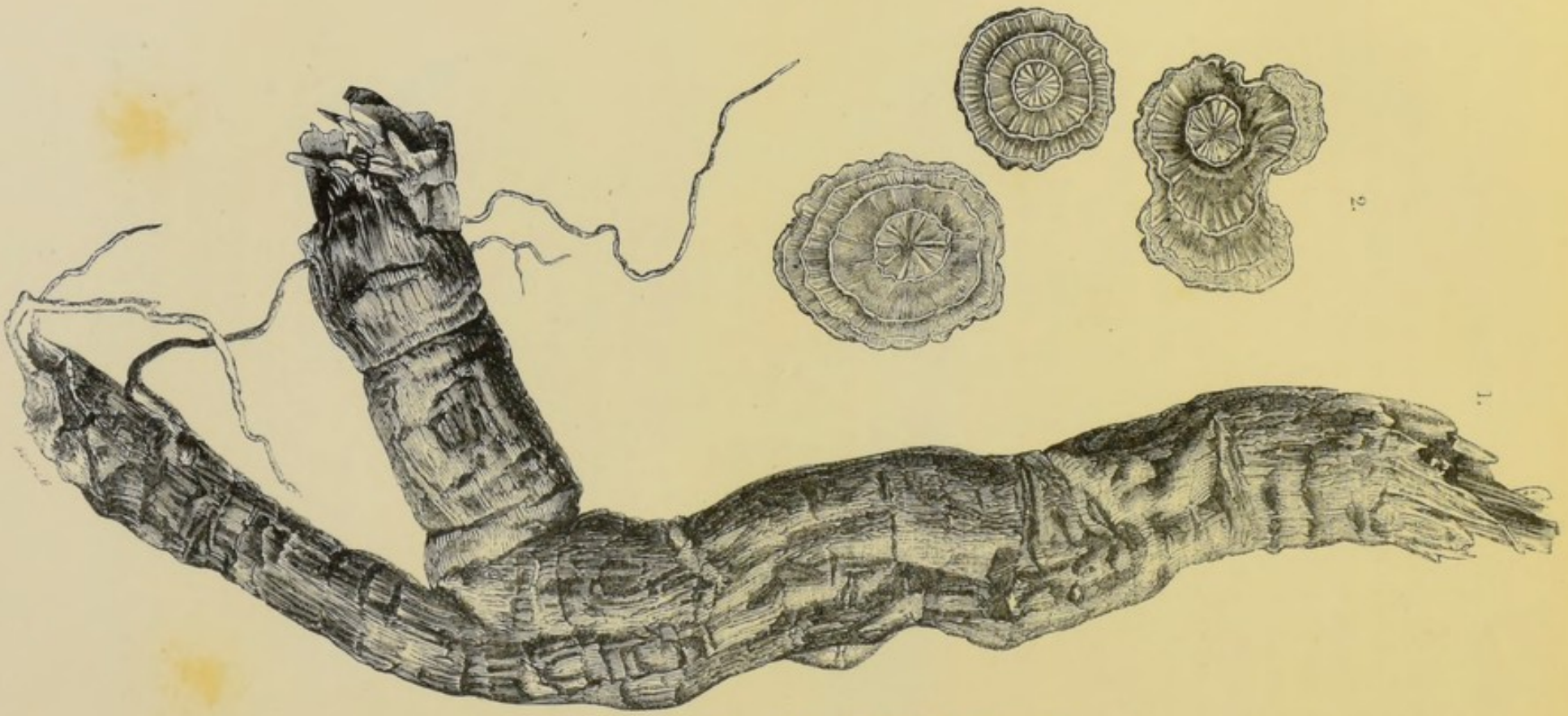
Cissampelos Pareiræ.



Transverse section of stem of *Cissampelos Pareira, L.* From a Jamaica specimen.

Commercial Pareira Brava

The Pareira Brava of English commerce is mostly of larger size than the root of *Chondodendron,* and is a much more woody substance. Its internal structure, which is familiar to most druggists, is very remarkable, consisting of a series of layers which are often developed exclusively in one direction. Nothing is known of the botanical origin of this drug beyond the fact that the structure of the wood is that of the order *Menispermaceæ.* Of late years even this sort has



True PAREIRA BRAVA, root of *Chondodendron tomentosum*.

1. From a sample purchased in London in 1862. 2. Sections of roots received from Mr. J. Correa de Méllo.

become rare, and its place has been taken by a drug completely devoid of medicinal power. This latter consists of cylindrical **1873.**



Root (?) commonly known as *Pareira Brava*, and erroneously regarded as derived from *Cissampelos Pareira*, L.

woody truncheons which have an internal structure not very

1873. diverse from that represented, though generally less eccentric, with always a distinct central pith. The wood is tasteless, and often seems to have been injured by damp. It should be rigidly excluded from pharmaceutical use.

Various kinds of Pareira Brava.

Several other sorts of Pareira Brava are known—at least in South America. One, of which there is a parcel now in the London market, is remarkable for its large size, and for being internally of a fine yellow. As it is also very bitter, it probably contains berberine.

Another sort is derived from *Abuta rufescens*, Aublet, a well-marked plant growing in Guiana and North Brazil. Specimens of a thick woody root, marked *Abutua grande* or *Parreira Brava grande*, and attributed to this species, have been sent to me by Mr. Correa de Méllo; they exhibit numerous concentric layers traversed by very distinct, dark medullary rays, the inter-radial spaces being white, and rich in starch. It is apparently a well-marked sort, and one I have not seen in commerce.[1]

Chondodendron.

In conclusion, I strongly advocate returning to the use of the root of Chondodendron, which is the drug on which the reputation of Pareira Brava was originally founded.

In Brazil this root is regarded as the legitimate sort, and is still held in the highest esteem.

Though it has not been clearly recognised by European writers, it is not altogether unknown. Guibourt[2] seems to have been acquainted with it and even correctly surmised its botanical origin. It is the root figured by Göbel and Kunze,[3] and there is an old specimen of it in the Pharmaceutical Society's Museum marked *Pareira Brava*. I myself met with it in the market in 1862. Lastly, Dr. Squibb has pointed out[4] that some small lots

[1] When Aublet was in Guiana, 1762-64, the stems of *Abuta rufescens* were shipped to France as *Pareira Brava blanc*. He says there is a variety of the same with the woody parts reddish, which is known in Cayenne as *Pareira Brava rouge*. He also describes and figures a plant he calls *Abuta amara* or *Pareira Brava jaune*, which has the wood yellowish and very bitter. This last is, I think, identical with the yellow wood of which, as I have said, there is a quantity now on sale as "*Pareira Brava*."—See *Hist. des Plantes de la Guiane Francoise*, i. (1775), 618-21, tab. 250-51.

[2] *Hist. des Drog.*, ed. 4, iii, (1850) 671.

[3] *Pharm. Waarenkunde*, ii. (1830-34), tab. 13, fig. 1, b-c.

[4] *American Journal of Pharmacy*, March 1, 1872, 107.

of Pareira Brava imported into New York in 1871 consisted in large part of a drug entirely different from any previously seen, and that he at first supposed it an adulteration; but that subsequent examination had shown him that the drug in question agreed well with the older descriptions of Pareira Brava, and especially with Pomet's figure, so that he was convinced it was true *Pareira Root*. From Dr. Squibb's description I feel sure that the drug before him was the same as that to which I have called attention in the present paper. 1873.

There can be no doubt that it would become plentiful if the demand should arise, and that it would advantageously replace the worthless kind now found in the drug trade. [*N. Repert. f. Pharm.* xxiii. 273.]

ON A PECULIAR CAMPHOR FROM CHINA.

(*Neuer Campher aus China, von Blumea balsamifera.*)
(*Bl. grandis*, D.C.)

ALTHOUGH the Chinese make large use of ordinary camphor, that is to say, of the camphor produced in Japan and Formosa by *Cinnamomum camphora*, F. Nees et Eberm., it is well known that they attach a much higher value to the camphor obtained in Sumatra and Borneo from the stem of *Dryobalanops aromatica*, Gärtn. 1874.

But there is a third kind of camphor standing intermediate in value between these two, and much less known, to which I desire to draw attention.

Rondot, in his work on Chinese commerce,[1] published in 1848, after speaking of the camphor of China, and before describing Malayan or Dryobalanops camphor, has a remark in reference to the drug under notice, to the following effect :—

There exists also another sort of camphor, extremely white, which is extracted from the leaves of a plant known in China under the name of *Ngai*, a variety of *Artemisia*. It occurs in crystals, which are very pure, clear, brittle, with a shining fracture ; it is much esteemed in China.

[1] *Étude Pratique du Commerce d'Exportation de la Chine*, Paris, 1848, 34-38.

1874. Our author quotes the prices of these sorts of camphor for the *picul* of 133⅓ lb., thus:—

Formosa camphor	25 dollars.
Japan camphor	30 „
Ngai camphor	250 „
Malay camphor, first quality	2000 „
„ „ second quality . . .	1000 „

Ngai Camphor. Other references to Ngai camphor are very slight, and imply that the writers had no practical acquaintance with the substance. Such, in fact, was my own case; I only knew of Ngai camphor by name, and I therefore drew attention to it in the *Admiralty Manual of Scientific Inquiry* (1871), by asking the following question—"*What is the camphor said to be obtained from a species of Artemisia* (*Wormwood*) *called* Ngai?" This brought a reply from Mr. Frederic H. Ewer, of the Imperial Maritime Customs, Canton, who kindly sent me specimens of Ngai camphor, together with a small branch of the plant from which it is made.

The specimens represent two forms of the camphor, the one a perfectly colourless crystalline substance, in flattish pieces, as much as an inch in length; the other, which Mr. Ewer regards as the crude state of the drug, is a crystalline powder of a dirty white, mixed with some fragments of vegetable tissue. The purer sample has an odour scarcely distinguishable from that of ordinary camphor; but the odour of the other is perceptibly contaminated with a smell like that of wormwood. Ngai camphor, like that of Dryobalanops, sinks into water. The investigations of its other properties and its chemical relations having been undertaken by my friend Professor Attfield, they will form the subject of a separate communication from his pupil Mr. Sydney Plowman.

Blumea balsamifera, D.C. The plant sent by Mr. Ewer is no species of *Artemisia*, though a member of the same order. It proves to be *Blumea balsamifera*, D.C., a tall, coarse-looking, herbaceous plant of Eastern Asia, an abundant weed in Assam and Burmah, and common throughout the Indian islands. It is well known to emit when bruised

1874.

a strong odour of camphor, and in Burmah a crude camphor is even extracted from it. Many years ago, a European named O'Riley purified some of this camphor, and attempted to bring it into notice as an article of commerce. According to Mason,[1] he made more than 100 lbs. of it, which he sent to Calcutta, where it was reported to be as good as ordinary camphor.

It is probable that the *Blumea* is not the sole source of Ngai camphor; for according to Mr. Ewer the character 艾 (*Ngai*), is applied to designate several plants, including both *Labiatæ* and *Compositæ*. The camphor is used not only in medicine, but also in the manufacture of the scented kinds of Chinese ink. Mr. Ewer states that about 15,000 dollars' (£3000) worth is annually exported from Canton to Shanghai and Ningpo, whence it finds its way to the ink factories of Wei-chau and other places. [*N. Repert. f. Pharm.* xxiii. 321.]

Scented Chinese Inks made with Ngai Camphor.

The Chemistry of Ngai Camphor was investigated at the same time by Mr. Sydney Plowman.

On making an ultimate analysis of three camphors the following results were obtained:—

Camphor analyses.

		Experimental.	Theoretical.
Laurel camphor	C	78·2	78·94
	H	10·44	10·52
	O	11·36	10·54
		100·00	100·00

		Experimental.	Theoretical.
Borneo Camphor	C	77·66	77·92
	H	11·68	11·69
	O	10·66	10·39
		100·00	100·00

		Experimental.
Ngai camphor	C	77·56
	H	11·6
	O	10·84
		100·00

[1] *Burmah, its People and Natural Productions*, 2nd. ed., 1860, 483.

CHONDODENDRON OR CHOND*R*ODENDRON.

1874. In the *Pharmaceutical Journal* for Nov. 14, 1874, it is remarked that the authors of the *Pharmacographia* prefer to write *Chondodendron*, and not as the derivation of the word would seem to require, *Chondrodendron*. The proposal to insert an *r* in the second syllable emanated from Mr. Miers, who, in his *Monograph of the Menispermaceæ*, states that the word was originally mis-spelt through an error in the press.

Spelling. As this name, which is that of the genus to which the Pareira Brava plant has been shown to belong, may come into more frequent use than hitherto, it is well that we should know what reasons may be urged in favour of each way of spelling.

The genus made its first appearance in the work of the Spanish botanists Ruiz and Pavon, entitled *Floræ Peruvianæ et Chilensis Prodromus, sive novorum generum plantarum Peruvianarum et Chilensium descriptiones et icones*, published at Madrid in 1794. Here we find it *Chondodendron*, with the derivation explained thus—"*a granorum copia quibus arboris truncus et rami obsiti sunt.*" This is in allusion to the Greek word χόνδρος, signifying *a corn, grain, or any small roundish mass;* and is appropriate to the plant by reason of the little black warty spots that cover the bark, chiefly of the younger wood.

χόνδρος.

From such an origin, coupled with δένδρον, *a tree*, the word *Chondrodendron* would naturally result: but for some reason —as I believe, for the sake of euphony—the authors of the genus chose to drop the first *r*, and to write *Chondodendron*. That this was by no typographical error is obvious. The word occurs again and again; and though there are enumerated several "*erratas de impresion*," *Chondodendron* is not among them. Four years after the *Prodromus*, the authors published their *Systema Vegetabilium Floræ Peruvianæ et Chilensis*, in which they still retained *Chondodendron;* in fact, the name has been almost universally accepted.

Thus De Candolle in his *Systema*, published in 1818, as well as in the first volume of his *Prodromus*, which appeared in 1824,

wrote *Chondodendron;* and so the word is adopted by Pöppig and Endlicher,[1] Lindley in his *Vegetable Kingdom* (1853), Eichler in the *Floræ Brasiliensis* of Martius, Bentham and Hooker[2] (1862), and lastly by Baillon in his *Histoire des Plantes*[3] (1871). **1874.**

With the sanction of such an overwhelming amount of authority, I am satisfied to accept the name without an attempt at improvement. It has served for eighty years in botanical literature, and may fairly claim admittance to that of pharmacy.

CINCHONA, OR CHINCHONA?

1875.

Orthography.

In his recently published *Memoir of the Lady Ana de Osorio, Countess of Chinchon,* Mr. Clements R. Markham has revived the discussion of a question which, so far as preponderance of practice can determine anything, might now be supposed to have been satisfactorily settled. It is whether the orthography "Chinchona" or "Cinchona" should obtain for this now famous genus. Reserving for a future opportunity a criticism of Mr. Markham's book, we briefly indicate here his views upon this subject.

Introductory notice by Dr. B. H. Paul.

There can be no doubt that Linnæus, in naming the genus, sought to connect it with the name of the lady who is reputed to have first made the healing virtues of the bark known to Europe. Whether he was well acquainted with the lady's name is not so clear. Mr. Markham thinks he was not, but that he received his knowledge of the Countess of Chinchon through a French source, and was thus misled into calling the genus *Cinchona* in the *Genera Plantarum* of 1742. He further thinks that Linnæus showed his uncertainty by the orthography "Cinhona" which occurred in the edition of 1764, but that he died before the error was pointed out and corrected. Mr. Markham sums up his arguments by stating that all authorities agree that "Chinchona" is correct, and that consequently "Cinchona," "Cinhona," and other forms are wrong; that the object sought

Mr. Markham's views.

[1] *Nova Genera ac Species Plantarum quas in Regno Chilensi, Peruviano, etc., legit* . . . . Lipsiæ, ii. 1838.

[2] *Genera Plantarum*, i. 1862-68, index and p. 34.

[3] *Monographie des Ménispermacées et des Berberidacées*, 1871, p. 36.

1875. of commemorating the services of the Countess is defeated by the mutilation of her name; that in much of the most important literature of the subject the word is spelt "Chinchona," and lastly that "the correct spelling should be universally adopted because it is right." He also quotes the following botanical authorities, who have explored the native forests of the genus, as spelling the word correctly:—Pavon, Ruiz, Tafalla, Mutis, Zea, Caldas, Seemann, and Spruce. Finally, with a chivalric admiration of the "illustrious and beautiful lady, Ana de Osorio," which is manifest throughout the book, Mr. Markham pleads that the correct spelling may be retained as the only way by which the "memory of her who made known to the world the inestimable value of quina bark" may be preserved.

Counter opinions. On the other hand, it has been contended that Linnæus purposely omitted the *h* for the sake of euphony, and that the law of priority must obtain; that botanical names are means, not ends, and their use as means once established it is all but impossible to alter them. Further that "Cinchona" has been so universally adopted that great inconvenience and confusion would result from any attempt to substitute "Chinchona" for it.

Mr. Hanbury's views. *Apropos* to this discussion, Mr. Hanbury has taken the opportunity of investigating the introduction by Linnæus of the genus *Cinchona*, and has pointed out that the mis-spelling of the name of the Countess occurs in several authors much earlier than Linnæus. He also proves that Mr. Markham is far from correct in asserting that the Spanish botanists, one and all, support the mode of spelling he (Mr. M.) advocates; but that, on the contrary, Mutis, as well as Ruiz and Pavon, follow the orthography of Linnæus. Mr. Hanbury's strictures are contained in the *Athenæum* of Jan. 30th, 1875, and are as follows:—

"In connection with Mr. Markham's proposal in his *Memoir of Lady Ana de Osorio*, reviewed in the *Athenæum* of the 23rd of January, that botanists should abandon Linnæus's word Cinchona (Sinkona) in favour of Chinchona (Tshin-tshona), and, as I presume, that doctors, pharmacists, and chemists should do the

same, and that the reform should extend to the words *Cinchonine* *Cinchonidine*, and *Cinchonicine*, as well as to any other derivations from the word Cinchona, may I be allowed a few remarks on the origin of the Linnæan name, and on some of the arguments used by Mr. Markham to support his case ? 1875.

Point admitted.

"It may be at once conceded that 'Chinchona' is a word which better commemorates the Countess of Chinchon than does 'Cinchona.'

"But let us trace the introduction of the genus *Cinchona* by Linnæus, and for this purpose let us have recourse to the actual volumes which formed part of the library of the great botanist, and which are, many of them, enriched with his MS. notes. They are now in the possession of the Linnean Society of London.

"In an interleaved copy of the *Systema Naturæ*, published in 1740, there occurs in the section *Pentandria Monogynia* a memorandum in Linnæus's hand, after the genus Genipa,—*Quinquina Cond.* This is the first allusion to the tree discovered by La Condamine, and on which Linnæus founded the genus.

Linnæus.

"In 1742 appeared the second edition (*aucta et emendata*) of the *Genera Plantarum*, and on one of the two pages of Addenda (p. 527) is the following sentence:—'In Pentandria monogynia post Genipam, Num. 168-1021, Cinchona. Quinquina *Condamin* Act. Gall. 1738.' In the *Ordo Generum*, the name is again printed Cinchona, and so likewise in the index.

"In the fourth edition of the *Systema Naturæ*, published at Paris in 1744, we read at p. 30,—'Cinchona, *Quinquina*, Cond. Le Quinquina,' and the same spelling is adopted in the editions of 1748 and 1756. Again in the fifth edition of the *Genera Plantarum*,—'*ab auctore reformata et aucta*,' which appeared at Stockholm in 1754, the spelling of the controverted word is again (p. 79) Cinchona, and so it is in the *Species Plantarum*, of which the first edition was printed in the previous year (1753).

"From these quotations, it may be fairly assumed that Linnæus fully meant to use the word Cinchona, and that its occurrence as Cinhona, in one solitary instance in the sixth edition of his *Genera*, 1764, was a mere typographical error, and not, as Mr. Markham seems to think, a proof that he desired to spell the word correctly.

"'It was still more unfortunate,' says Mr. Markham, that Linnæus died before the error was pointed out and corrected. This was done by the Spanish botanists, Ruiz and Pavon who, landed in Peru in 1778, the very year of Linnæus's death. They explored the forests of Huanuco and Loxa, discovered many new

1875. species of Chinchonæ, and are among the highest authorities on the subject. They strongly advocated the correct spelling. . . . The botanist Mutis, with his disciples Zea and Caldas, were engaged in the study of the Chinchonæ of New Granada, the former residing in South America, chiefly at Bogota, from 1783, until his death in 1808. They also spelt the word correctly.

"'That Linnæus could not have been ignorant of the correct spelling at a much earlier date than that mentioned seems probable from the following circumstance:—In 1758, J. Ch. P. Petersen read at Upsala an academic dissertation, "De Cortice Peruviano," Linnæus presiding. In this production, which was afterwards printed, the name of the Spanish Viceroy appears (more than once) as "Comes del Chinchon," while the bark is spoken of as "Chinchona," and never as Cinchona ("quamvis nonnulli Chinchonam in scorbuto esse magni ponderis remedium . . . .' p. 10.

Letters of Mutis to Linnæus.

"As to Mutis, Mr. Markham overlooks the fact that that botanist was residing at Bogota, not merely in 1783 but in 1763, under which latter date he wrote thence to Linnæus; and that a correspondence was kept up between them for eighteen years. Some of Mutis's letters are fortunately extant, and form part of the Linnean collections at Burlington House. As they throw some light on the subject, I have made from them a few extracts. Translations of the letters may be found in Sir J. E. Smith's *Selections of the Correspondence of Linnæus*, London, 1821.

"24th Sept., 1764.—(Mutis to Linnæus). 'Verum ne plane ineptissimæ hæ literæ tibi viderentur, inconem et flores quosdam Chinchonæ adjungere duxi. An descriptioni suæ figuram ullam addiderit Celeberrimus de la Condamine, vel an plantam siccam examinasse tibi licuerit, necne, cum nullam notam in descriptione Chinchonæ editionis Holmiæ 54 videam, non plane mihi constat.' (The drawings and specimens here alluded to, still exist in the Linnean herbarium.)

"3 Oct., 1767.—(The same to the same.) '. . . sane præter ultimas lineas, in quibus nunciabatur, te Cinchonam accepisse; quasque in Civitate Bogotensi, antequam illinc longissimæ peregrinationi paratus decederem, summa jucunditate legisse contigit. . .'

"15 May, 1770.—In this letter the name of the plant occurs four times, and is always written after the fashion of Linnæus with one *h*. Appended to the letter, Mutis sends a botanical description of a plant which he calls *Cinchona Gironensis*.

"6 June, 1773.—Mutis here acknowledges the receipt from

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Linnæus of certain works of the latter, and expresses his pleasure at the honourable mention of himself by Linnæus under the head of Cinchona; and he also refers to a small present which he transmits by Don Ruiz-Pavon, who is going to Upsala.

"8 Feb., 1777.—This letter contains notes on some plants sent by Mutis to Linnæus, one of them being entered as *Cinchona Bogotensis*.

"12 Sept., 1778.—A long letter of condolence from Mutis to the younger Linnæus. It contains the following passage:—'Maxime disto a solo natali Cinchonæ officinalis a me detectæ, cujus viciniis crescit etiam Mutisia.'

"In none of these letters is there a hint of disapprobation of the name Cinchona, which it will be noticed that Mutis adopts, immediately he finds it used by Linnæus.

Ruiz and Pavon.

"Mr. Markham asserts that the error was pointed out by Ruiz and Pavon. But surely he cannot be conversant with the *Quinologia* of Ruiz, published at Madrid in 1792, or with the *Suplemento*, which appeared, under the joint authorship of Ruiz and Pavon, nine years later, in neither of which works is the name of Linnæus's genus written otherwise than Cinchona. Mr. Markham must be also unaware that in the *Flora Peruviana et Chilensis* of Ruiz and Pavon, the name in dispute is uniformly written Cinchona, and never Chinchona. Pavon, indeed, in his later years is stated by Howard to have pleaded for the word Chinchona. This was done in his *Nueva Quinologia*, a work written between 1821 and 1826, but which never saw the light until 1862, when it was edited in an abridged form by Mr. Howard.

Cinchon adopted *ante* Linnæus.

"But the error in the name of the Spanish viceroy originated long before the time of Linnæus. Sebastiano Bado, the author of *Anastasis Corticis Peruviæ* (Genoa, 1663), and one of the principal authorities for the early history of Peruvian bark, writes 'Cinchon' for Chinchon. Morton, in his *Pyretologia*, 1692, mentions the Count's name in the same inaccurate manner. So does La Condamine in 1738, and Geoffroy in 1741. By some of these writers Linnæus was misled, and was afterwards, perhaps, fortified in his error by the rules he had laid down about the immutability of generic names.

"That one of these rules was supposed to apply to the case in question, is evident from the remark of Ruiz:—'Linneo parece que debió haber expresado el titulo de los Condes de *Chinchon* en su género, dandole el nombre de *Chinchona* y no el de *Cinchona*, con el que tambien le nombro yo, atendiendo

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al Canon 243, de su Filosofía Botánica en que dice, *Nomen genericum dignum alio, licet aptiore, permutare non licet.*'[1]

Authority of Linnæus.

"Though the canons of Linnæus may no longer command the implicit obedience that they were once thought to deserve, it cannot be denied that there is a general reluctance among botanists to alter the Linnean names, and this is particularly the case in the present instance, where the alteration advocated would require to be followed in innumerable writings on pharmacy and chemistry. 'In our science,' wrote Dr. J. E. Smith, in 1807 (*Introduction to Botany*), 'the names established throughout the works of Linnæus are become current coin, nor can they be altered without great inconvenience. Perhaps, if he had foreseen the future authority and popularity of his writings, he might himself have improved upon many which he adopted out of deference to his predecessors, and it is in some cases to be regretted that he has not sufficiently done so.'"

[1] "It seems that Linnæus ought to have indicated the title of the Counts of Chinchon, by giving to his genus the name Chinchona, and not Cinchona, which latter, however, I adopt, in accordance with Canon 243 of the *Philosophia Botanica*, which says, *Nomen genericum*, etc."

ADDRESSES

AND

MISCELLANEOUS PAPERS.

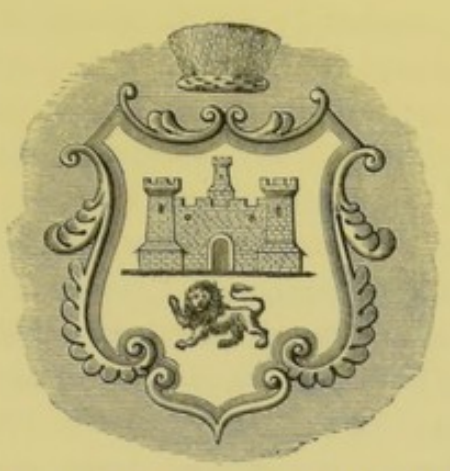
BRITISH PHARMACEUTICAL CONFERENCE.

CONSTITUTION.

Art. I.—This Association shall be called the British Pharmaceutical Conference, and its objects shall be the following:—

1. To hold an annual Conference of those engaged in the practice, or interested in the advancement, of Pharmacy, with the view of promoting their friendly reunion and increasing their facilities for the cultivation of Pharmaceutical science.
2. To determine what questions in Pharmaceutical science require investigation, and, when practicable, to allot them to individuals or committees to report thereon.
3. To maintain uncompromisingly the principle of purity in medicine.
4. To form a bond of union amongst the various associations established for the advancement of Pharmacy, by receiving from them delegates to the annual Conference.

Art. II.—Membership in the Conference shall not be considered as conferring any guarantee of professional competency.



OPENING ADDRESS. NORWICH, 1868.

(*Eröffnungsrede der Pharm. Conference zu Norwich.*)

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GENTLEMEN,—In accordance with the arrangement made last year at Dundee, we have assembled to hold at Norwich, as usual under the shadow of the British Association, the Fifth Anniversary Meeting of the British Pharmaceutical Conference.

Newcastle-on-Tyne.

Instituted at Newcastle-on-Tyne in the year 1863, and commencing its labours on a humble and unpretending scale, our Society has year by year increased in numbers, while the proceedings of its annual meetings, regularly held now for five years, have by no means retrograded in interest and importance.

Object of the Conference.

Thus congratulating you on the successful progress and present well-being of our Society, as evidenced by its list of members, now numbering over 550, as well as by the variety of interesting communications presented at our meetings, let me remark that we must not relax our efforts in promoting that spirit of study and research which so highly contribute to advance the dignity of the profession of pharmacy. The meetings of the British Pharmaceutical Conference are not, indeed, to be precisely measured by the importance of the papers brought before them; they have another object besides the discussion of scientific subjects, namely, that of binding together with a cord of union the pharmacists of this land,

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American Pharm. Association.

The advantages of such associations have long been recognised on the Continent. In Germany, France, and Switzerland, we find that the pharmacists of some large district meet annually by mutual accord to discuss subjects bearing on the well-being of their profession. In the United States, where the conditions under which pharmacy is practised resemble more closely those which prevail in our own country, there exists, as most of us well know, a flourishing association for the promotion of science in connection with pharmacy, as well as for the discussion of subjects bearing on pharmacy as a trade. This is the American Pharmaceutical Association, the fifteenth annual meeting of which was held in New York in the autumn of last year. Let us take a glimpse of the proceedings of our brethren on the other side of the Atlantic when congregated in the University Building, New York, on the 10th, 11th, 12th, and 13th of September, 1867. At the opening session, delegates appointed by the Colleges of Pharmacy of Massachusetts, New York, Philadelphia, Maryland, Cincinnati, and Chicago, by the Pharmaceutical Associations of Maine and of the district of Columbia, and by the Alumni Association of the Philadelphia College of Pharmacy, presented their credentials, which after due examination were reported satisfactory. Then we find a resolution passed to this effect—that "the Professors of the College of Pharmacy, and of the medical colleges of this city, also the medical profession in general, be invited to seats in the present meeting." This has struck me as a particularly wise and liberal proceeding, showing that it is not narrow trade interests that the Association has met to discuss, but subjects which, though of special interest to a small section of the community, really bear on the welfare of all, and which claim moreover the serious notice of those who are custodians of the public health.

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American Pharm. Association.

A list of new members is next given, and then follow reports of the Executive Committee, of the Committee on the Progress of Pharmacy, of that on the Drug Market, of those of Scientific Queries and on Internal Revenue Law, concluding with a report of the delegates to the International Pharmaceutical Congress, held in Paris last August.

Various books and pamphlets were also laid before the meeting, the first-mentioned being the proceedings of the British Pharmaceutical Conference held at Nottingham. An inaugural address from the President, Mr. Stearns, was, in his absence through ill-health, read by Professor Parrish. The reports presented at a previous sitting were next taken up, and necessarily occupied a considerable time. That on Scientific Queries brought forward the various papers on scientific subjects which had been offered to the Association, among which the following may be mentioned:—

A paper on the use of Benzoin in Ointments, by Mr. Doliber.

On the Tartrates of Potash and Tartaric Acid from American Tartar; on Quicksilver in North Carolina, and on *Mata*, a leaf used by Mexicans to flavour tobacco; on American Opium, the analysis of which showed it to contain over 10 per cent. of morphia, all by Mr. E. S. Wayne, of Cincinnati.

On the inner coat of the gizzard of the South American Ostrich, as a remedy for dyspepsia. (I hope *we* shall not be called upon to provide this new medicine.)

Mr. William Saunders, of London, Canada West, contributed a paper on the relative value of the rhizoma and rootlets of *Podophyllum peltatum*, proving that the rootlets afford most resin.

This will suffice to show the useful and practical character of the work done by our transatlantic brethren; now, gentlemen, let us take a brief review of some of the contributions to pharmaceutical knowledge made in our country since we last met.

Detection of Alkaloids.

The detection and exact recognition of the vegetable alkaloids is one of the most important and delicate operations that it can fall to the lot of the chemist to attempt, and any addition to

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the tests already in use merits attention. Dr. Guy may, therefore, well deserve our thanks for the exactitude and unwearied patience with which he has performed an immense number of experiments on the sublimation of the alkaloids, a process first brought to the attention of the chemists in 1864, by Dr. Helwig, of Mayence. Dr. Guy has arrived at the conclusion that this method of subliming substances in minute quantities on flat surfaces of glass, in order to their complete examination by the microscope, a method first recommended for arsenious acid and corrosive sublimate, may be advantageously extended to the alkaloids and analogous active principles—that characteristic results are readily afforded, with very minute quantities, such as a thousandth of a grain of strychnine, or even less—that the results obtained by sublimation in the case of the alkaloids and analogous active principles are not more subject to failure than those of other tests; in fact, that several of the reactions are remarkable for delicacy, constancy, and characteristic appearances.

Sublimation of Alkaloids.

Closely connected with this subject is the question of the temperature which must be reached in order that any particular alkaloid may assume a gaseous form, or, in other words, that it may sublime. Dr. Guy, impressed with the unsatisfactory statements made in toxicological works, and the somewhat rough modes of procedure adopted in order to test the volatility of such bodies, has applied himself to devise a more exact method, to the results of which, communicated in the *Pharmaceutical Journal* of February last, I must refer you.

Another excellent observer, who has also studied this department of chemistry, is Mr. H. J. Waddington, whose paper on micro-sublimation elicited, when read, some interesting remarks from Dr. Guy, Dr. Attfield, and others. In common with Dr. Guy, Mr. Waddington had experienced the defects of the common method of subliming in a glass tube over a naked flame substances so easily decomposed as vegetable alkaloids, a method which has given rise to such statements as that a body is *partly sublimed and partly decomposed*, which seemed to imply that the substance exposed to heat is not homogeneous, but that one

Micro-Sublimation.

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part of it is volatile without decomposition, while the other is not. But no substance, as Mr. Waddington remarked, can sublime and decompose at the same temperature; partial sublimation and partial decomposition must be owing to a mechanical defect in the arrangement for heating the substance. That the subliming and decomposing points of many substances approximate very closely is most probable, for when the heat has been most carefully applied, it has often happened that a sublimate has been contaminated with coloured matter which could only have arisen from decomposition. Dr. Attfield argued that it was almost as impossible to limit the subliming point of a solid as the evaporating point of a liquid, and instanced iodine, camphor, naphthaline, mercury, and ice as solids, volatile at all temperatures. But are strychnia and morphia analogous with these, and is there any evidence that these latter are at all volatile, except at an elevated temperature?

Mr. Waddington.

I must pass from this interesting subject, noticing only that we have further to thank Mr. Waddington for remarks on the preparation of microscopic crystals, a communication of great interest to any one desirous of pursuing the subject, the practical value of which has been illustrated by our colleagues Messrs. Stoddart, Deane and Brady.

Water Analysis.

The analysis of potable water, more especially with a view to the determination of the organic matter it contains, continues to attract the attention of chemists both in England and on the Continent, and the various methods proposed for arriving at results more accurate than those hitherto attained, have been vigorously discussed. Dr. Frankland's paper on water analysis, in the *Pharmaceutical Journal* for February last 1868, gives some idea of the elaborate pains required for arriving at satisfactory results.

Attfield's analysis of a medicinal spring.

Let me here notice the extremely interesting account of a medicinal spring in Jamaica, given by our friend and colleague Dr. Attfield. The water of this spring is remarkable, not only for the excessive amount of saline matter it contains, but likewise from this saline matter consisting exclusively of the chlorides of calcium, sodium, and ammonium, the first-named being in the

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proportion of 1,510 grains in the imperial gallon. Assuming the flow of the spring to be as stated, about seventy gallons per hour (certainly no vast quantity), the amount of chloride of calcium outpoured in the course of twenty-four hours would be equivalent to 363 pounds. No other example is known of water so rich in this mineral constituent.

A propos to this subject, I must draw your attention for a moment to the volume on the table,—an essay on water, in which that ancient element is scrutinized and considered in every possible way. This fine work, a quarto of 400 pages, emanates from a Brazilian, a member by examination of the Pharmaceutical Society of Great Britain, Senhor Antonio Alves Ferreira, of Rio de Janeiro.

A. Alves Ferreira.

Experiments on the therapeutic action of drugs, to be of real value must be carried on with so many precautions, so much patience, and attention to so many collateral circumstances, that practitioners of medicine as well as pharmacists may well be indebted for information such as that communicated by Dr. John Harley in his Lectures on the action and uses of Conium, Belladonna, and Hyoscyamus. Dr. Harley's experiments on Conium seem to me a model of careful therapeutic research. The results are of great interest, proving conclusively that the drug is an active medicinal agent, but one of which the pharmaceutical preparations have been so defective and uncertain that the efficacy of the medicine had come to be regarded as very questionable. The dried leaf of hemlock was found by Dr. Harley to be of little if any value; the tincture whether made from leaf or fruit, to be inert (except from its alcohol), and the extract to be so weak in conia, that it required to be given in doses of thirty to forty grains to produce the least effect. The only preparation which retains the active principle of the drug, in sufficient quantity, is the *preserved juice*, given in the dose of from two to eight drachms, is a safe and valuable medicine. As to Belladonna, Dr. Harley considers that its medicinal powers are wholly resident in atropine, a substance which I, as a druggist, may remark is far more satisfactory to handle than a liquid like conia, or a highly deliquescent solid such as hyoscyamine. Dr.

Dr. John Harley.

Conium.

Belladonna.

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Harley finds that its activity is destroyed by fixed caustic alkalies—an observation previously made, as you will remember, by Dr. Garrod, who also pointed out the impropriety of combining hyoscyamus with a caustic alkaline solution, such as *Liquor potassæ*. The action of an alkali on atropine is not instantaneous, in fact the power of the atropine is not apparently diminished when freshly mixed. If, as is probable, the same observation holds good for hyoscyamus, it allows of that drug being administered with potash, provided the two are mixed at the moment of taking the dose, or perhaps it would be still better to give them separately.

Henbane.

The analysis of jalap was the subject of a communication made at our last meeting, and it is one which seems still deserving attention. Messrs. T. and H. Smith assert that, in many trials, they have never obtained of the resin more than 15 per cent., while our colleague Mr. Umney, has recently obtained 21·5 per cent. from the Vera Cruz drug. Dr. Squibb considers that powdered jalap, which does not yield over 12 per cent., of dry resin should be rejected as unfit for use, an opinion I cannot endorse, for I have found Vera Cruz jalap of undoubted goodness which yielded but 11 per cent., and a similar result was obtained by my friend Mr. Broughton.

Jalap.

The transition from jalap to rhubarb is natural, at least in the popular mind; and I notice this latter drug in order to remind you of the interesting account of the cultivation of rhubarb in England, recently published by Mr. Usher in the *Journal of the Society of Arts*. Although the directions of the Pharmacopœia preclude the employment in an English pharmacy of any other rhubarb than that of China (and most of us are practically unacquainted with any other), yet no such limitation extends to other countries, and that British rhubarb is appreciated *somewhere* is proved by the fact alleged by Mr. Usher, that the demand is greater than the supply. The disappearance from commerce of the old-fashioned Russian rhubarb, a drug that was of uniform excellence, has been followed by a remarkable alteration in that shipped from China. For the last two or three years this latter has been singularly bad in quality, whole chests

Rhubarb.

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affording only a few pounds of the drug in a sound condition. As the price has also very much advanced, it is not surprising that British rhubarb, which is at least well prepared and of good appearance, should find numerous purchasers. The increased facilities for traversing the interior provinces of China may soon, I hope afford an opportunity of reaching some of the districts in which rhubarb is produced, and of bringing thence living plants of this most valuable drug.

Kamala.

Dr. Flückiger, of Berne, one of the most careful and profound pharmacologists living, and who I am happy to tell you is a contributor of some papers to our Conference, has lately pointed out that a second sort of Kamala, differing essentially from that derived from *Rottlera tinctoria*, Roxb., has been imported into commerce. This new form of the drug appears as a dark chocolate-coloured powder, which is seen to consist of grains of larger size than those of ordinary kamala, and of very different structure. The new drug is almost entirely free from sand, which has not been the case with most of that hitherto found in the market. Yet freedom from earthy admixture is a condition in which it is possible to obtain kamala, even as a commercial article. Some quantity of it recently shipped from India was so pure that it afforded upon incineration only 1·37 per cent of ash.

Cinchona.

The introduction of the Cinchona into India, is an enterprise the success of which ought to be gratifying to every Englishman, not indeed so much as a source of commercial wealth to our country, as because it will, we may hope, perpetuate to the world a supply of those precious barks which the improvidence of the South Americans has long threatened to annihilate. To the Dutch we must concede the honour of having led the way to the good results which our plantations promise to afford; for although the culture of the Cinchona was thought of and even feebly attempted so far back as the year 1852, it was not until after extensive plantations were commenced in Java in 1854, that our Government was stimulated to take the matter actively in hand; and it is to the experiments, the failures, the errors of these first Dutch cultivators that we are indebted for much of the success already attained.

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The chief plantations in British India are those on the Neilgherry Hills, near Madras, the most elevated mountain range in India southward of the Himalaya. "The climates of the Neilgherry Hills," observes Markham, "are the most delightful in the world, and it may be said of this salubrious region, with its equable seasons, what the Persian poet said of Kung, 'The warmth is not heat, and the coolness is not cold.'"

Cinchona Cultivation.

By a parliamentary return, it appears that in May, 1866, the number of Cinchona plants in the Government plantations in this locality was 1,233,645, of which nearly 300,000 belonged to the species yielding red bark, 758,000 to that affording pale or crown bark, and 37,000 to *Cinchona calisaya*. This, it must be remembered, by no means indicated the full extent of Cinchona culture on the Neilgherries, since there were, in addition, considerable plantations belonging to private individuals. From Mr. Broughton's report published in April of last year, which is the latest information to which I have access, it appears that the number of plants of the red bark in the Government plantations in that locality was at that date 800,000, which is an enormous advance on the return from which I have just quoted. Other plantations have been formed in Wynaad, Coorg, on the Pulney Hills, and in Travancore, in British Sikkim, in the Kangra valley in the Punjab, and at Mahabaleshwur, in the Bombay Presidency. In Ceylon, the success that has attended the introduction of the Cinchona has been most marked, "Many thousands of plants," writes Mr. Thwaites, "have been distributed from the Hakgalla garden, and I have received most favourable reports of their perfect health and vigorous growth; and not a single report of an opposite character has yet reached me; so that there appears to be every prospect of quinine becoming before very long one of the most important products of the island."

Darjeeling.

From the Himalaya the account is no less remarkable. At Darjeeling, which, as you will remember, is one of the health-stations for the Europeans of Calcutta, there are now five plantations for the cultivation of Cinchona, with an aggregate total in April last of more than 1,558,000 young trees, of which

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a large proportion belong to the species which furnish what are called crown bark and red bark.

Cinchona Cultivation.

But however rapid and vigorous the growth of the Cinchona in India, the culture of the tree would avail but little, unless the bark were as rich in alkaloids as that produced in South America.

In fact, at the outset of the enterprise many persons capable of judging had considerable misgivings as to the results. If the young plants could be induced to grow, would it not be needful to wait a generation, at least, before they would produce bark that it would be worth while to remove? Should we not destroy the trees by the operation? And if we, at last, got the bark, might it not prove deficient in those constituents which render that of South America so valuable?

These surmises have happily not been verified; in fact from the numerous analyses of Mr. Howard, Dr. De Vry, and Mr. Broughton, it is evident that the percentage of alkaloids in the bark grown in India may exceed that obtainable from the same sort of bark grown in its native country. Another point well worthy of notice is that the proportion which one alkaloid bears to another varies extraordinarily in the same species—sometimes quinine predominating, sometimes the less valuable cinchonine or cinchonidine. We are as yet, to a great extent, ignorant of the causes of this variation; but that they may be discovered and controlled seems to be the conviction of those most competent to form an opinion, for we find Mr. Howard speaks of a plant being "*encouraged*" to produce quinine instead of cinchonidine.

Mossing.

In fact, the process of coating the stems with moss after the removal of the bark as first practised by that most skilful of cultivators, Mr. McIvor, is found not only to favour the rapid reproduction of the bark, but even to increase its richness in alkaloids; and it seems we may hope to go a step further, and to settle what those alkaloids shall be.

Cultivation of Ipecacuanha.

The success that has attended Cinchona culture naturally led to the inquiry whether there are not other medicinal plants that may be introduced into our Colonies with equal hope of good results? Though we can certainly point to none at all

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comparable in importance to that which affords quinine, there yet are a few, the cultivation of which is being attempted on an experimental scale. Of these, the most important seems to be Ipecacuanha, plants of which are now growing at Calcutta and Madras, as well as in the West Indian island of Trinidad; but in none of these localities does the plant prosper vigorously. In fact, the experiment looks as little hopeful as the Cinchona enterprise did when the first bark trees were sent to India by Dr. Royle; and until we get a supply of good seeds from Brazil, I do not anticipate that it will be possible to make a fair trial of propagating the ipecacuanha plant in India or elsewhere.

Cultivation of Jalap.

The experiments made in cultivating the jalap plant (*Exogonium purga*, Benth.) are much more hopeful, and I have the gratification of presenting to your notice the first specimen of that drug produced in India. It was grown at Ootacamund where live roots carried from England by my friend Mr. Broughton were planted in January, 1867. These roots grew with surprising luxuriance, each producing a fine cluster of tubers; some of them were dug up in December of the same year, when the largest tuber was found to weigh over a pound and a half. This jalap of India, you will observe, differs very notably in appearance from that we get from Mexico, owing chiefly to a different mode of drying; in fact, to facilitate this operation, the tubers have been sliced. It compares, however, favourably with that of Mexico, as regards percentage of resin, and from a few trials made in India, we may judge that its medicinal powers are fully maintained.

Calumba root.

Let me now draw your attention to a fine specimen of calumba root, the produce of plants cultivated in Mauritius. It is, as you, will readily perceive, remarkable for its fresh and brilliant colour and, were it in the market, it would, I think, command a far better price than the somewhat dingy drug that has lately reached us through the ordinary channels of commerce.

Here are some pieces of calumba root in a living state recently brought from Trinidad by my friend Mr. Prestoe, superintendent of the botanical garden in that island. Remark the brilliant yellow hue of the freshly-cut root.

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The calumba plant seems to be of easy culture, and no reason appears why it should not be cultivated for the sake of its medicinal root in any country possessing a hot climate and a moist, rich soil.

Delusive acclimatisation.

But though I am thus advocating the culture of certain medicinal plants, there is a vastly larger number, the culture of which, with a view to profit, it would, I firmly believe, be a delusion to attempt. Drugs already cheap, abundant, good; drugs in small demand; drugs which are comparatively unessential, or well represented by others; those that are only procurable from plants or trees which arrive but slowly at maturity; those which, like sarsaparilla, are only found in regions uninhabitable to civilised man; these, I say, we can afford to let remain products of the forest, some of them to disappear before the axe of the colonist, a few to hold their places in the interstices of cultivation as the companions of more important and useful plants.

Now, gentlemen, let me conclude, for I cannot but remember that there are gentlemen present who have to bring forward the results of their original experiments, while I have been entertaining you with only a narration of the labours of others. A duty, however, remains, and that is a pleasing one—of tendering my cordial thanks, in which all my fellow-visitors will join, to our Norwich friends for the excellent arrangements they have made for our meeting, and for the kindliness and hospitality with which we have been received.



OPENING ADDRESS, EXETER, 1869.

(Eröffnungsrede der Pharm. Conference zu Exeter.)

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GENTLEMEN,—The custom which has hitherto prevailed at the annual meeting of the British Pharmaceutical Conference imposes on the President for the time being the duty of initiating the proceedings by a few preliminary remarks, or as our secretaries are pleased to call it—an address. Properly to perform this duty is to me no easy task, but it would be still less so if I could not commence by congratulating you on the growing usefulness and importance of our association. Last year we met in an eastern capital: our sixth anniversary brings us to the west of England, to find in the good city of Exeter a welcome no less cordial and fraternal than we have experienced on any previous occasion. Had the Pharmaceutical Conference no other merits, we might say that at least it gave the opportunity of some agreeable relaxation,—an excuse for breaking away for a week or more from the routine occupations of business, an occasion for visiting a locality which one might otherwise have no particular object for seeing, and of social and friendly intercourse, to which often attach the most pleasant recollections. But our Conference claims more than this; and the report of our meeting last year at Norwich would prove, were it necessary, that the advancement of scientific pharmacy is one of the very principal objects with which our association is concerned.

Advance of Pharmacy.

On that occasion, it will be remembered, a portion of two sittings was occupied in a very animated discussion of the

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The Pharmacy Act.

Pharmacy Act, then just passed, and in listening to an explanation of the new law, ably given by two members of the Conference who were particularly conversant with its provisions. It would be interesting to know what have been the experiences of our members as to the working of the Act in the practical carrying on of business. Has it proved a safeguard and benefit to the public? Have its provisions with regard to the sale of poisons been easily complied with, or have they been found irksome, or even impracticable? To these questions, it is to be expected, the answers will be very various, owing to the diverse character of the chemists' businesses on which the law will bear. Speaking from my own experience, I may say that in the city of London there has been very little difficulty in complying with the requirements of the Pharmacy Act, and that its tendency has been advantageous to public safety and convenience. On the subject of registration and the other important provisions of the Act, I will now say nothing; but I must make a passing allusion to the very great stimulus to improved education which such a measure will infallibly prove. Its effects are already apparent: in no previous year have the laboratories at Bloomsbury Square been filled with more numerous and intelligent students; and though I know that some exception may be taken to one class of our examinations on the ground of their lenient character, it is no insignificant fact that 600 persons have passed these ordeals in the house of the Pharmaceutical Society during the first six months of the present year.

Sale of poisons.

With regard to the sale of poisons, it is not a little remarkable that in this country no law should have been in force to restrain or regulate it, until the Arsenic Act was passed in the year 1851. Contrast this with the state of things in France, where so far back as A.D. 1353, nearly five hundred years before, a law was passed to regulate the profession of apothecary and herbalist and to subject the shops of such persons to inspection. By this law it was enacted, that they should not sell or deliver any dangerous poisonous medicine or such as would occasion abortion, whether simple or compound, to any person out of the pale of the Christian faith, or to any person to have the same if

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they did not well know that he was a master, or learned person, or expert in the science of medicine and well known, the which they should judge in their conscience sufficient, and that it was by express command of a physician who had sent for such medicines and as above is said . . .

Ancient legal enactments.

The necessity of subjecting a buyer to something like a theological examination may seem nowadays rather unpractical, but not impossible, if intended, as I think it was, to be enforced against Jews who in the middle ages were distinguished by their dress, and were, as is well known, the objects of every kind of persecution and opprobrious distinction. The same law contains other curious provisions, some of which descend to minute particulars, as the following :—

". . . . and also that the medicinal electuaries, or opiates, or other medicines liable to be long kept, made and put into pots or other suitable vessels, shall be labelled with the year and month when confected, and that they shall sell the same at a loyal, just and moderate price and with just regard to variation in the currency . . . . . and also that whenever required they shall weigh all their medicines and not deliver them by guess."

The apothecaries of Paris.

In the previous reign, that of Philippe de Valois, an injunction concerning the apothecaries of Paris was addressed by the king to the provost of the city, requiring that he should compel the apothecaries to show their medicines to the Masters of the Faculty of Medicine, that the latter might judge of their purity and good condition.[1]

[1] These laws are thus quoted in the *Recueil Général des Anciennes Lois Françaises* par Decrusy, Isambert et Jourdan, tome iv. pp. 679-681 and p. 424.

"Ordonnance sur l'exercise de la profession d'apothicaire et d'herbier, et qui les soumet à la visite."—Paris, aôut, 1353.

"Jehan, par la grace de Dieu, roy de France, sçavoir faisons à tous presens et avenir."

". . . . et qu'il ne vendront, ne bailleront aucune medecine venimeuse perilleuse, ou qui puissent faire abortix, simples ou composées à nulles gens, qui soient hors de la foy chrestienne, ni à aucunes gens avoir se il ne connoissent bien, que il soit maistre ou sciencier, ou expert en la science de medecine, et bien cognu, lequel il cuideront en leur conscience souffisant, que ce soit par exprès commandement de physicien, qui les eut envoyé querir, et se comme dessus est dit . . . . .

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In connection with the Pharmacy Act, it is proper that I should here inform you that the proposal made at our meeting at Norwich last year for some public recognition of the eminent services rendered to the cause of pharmaceutical education and the improvement of the status of pharmacy, by Mr. Sandford, was warmly taken up at meetings held at the house of the Pharmaceutical Society on the 6th and 13th of October last, on the latter of which occasions a committee was organized for carrying it into effect. It is unnecessary that I should recount to you the subsequent proceedings and numerous meetings of this committee; suffice to say that a subscription was raised, amounting to about £500, of which £200, invested in the form of plate, was presented to Mr. Sandford on the 19th of May last, on the evening of which day a complimentary dinner was given to him at the Freemasons' Tavern. The balance of the subscription is to be expended on a portrait of Mr. Sandford, to be placed on the walls of that institution for the welfare of which he has laboured with so much devotion and, I think I may add, with such eminent success.

Sandford Testimonial.

Scientific Pharmacy.

The progress of scientific pharmacy, as evidenced by the various memoirs, papers and notes that have appeared in this and other countries during the year that has elapsed since our last meeting, is a subject too wide and too difficult for me to attempt to discuss on the present occasion. Yet it may be

"... et aussi que les medecines electuaires ou opiates, ou quelconques medecines de longue conservation, faites et mises en pots, on autres vaisseaux convenables par eux, ils mettront sur le pot, l'an et le mois de la confection, et que il vendront à loial, juste et moderé pris, et loyal et juste regard à la mutation de la monoie .... et aussi que il peseront toutes leurs medecines, et ne les bailleront pas en tache, toutefois que requis en seront."

"Mandement portant que les remèdes des apothicaires de Paris seront visités par les médecins de la faculté."

"Philippe par la grace de Dieu, roy de France: au prevost de Paris, ou son lieutenant, salut."

"... et que tu les contraignes à montrer ausdits maistres [de la faculté de medecine] les medecines laxatives, et les opiates, qui se gardent par long temps, pour les voir, avant que elles soient confites, et sçavoir qu'elles soient bonnes et fraiches et non corrompuës et tresallées ..."

"Donné à Paris, le 22 de Mai 1336."

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neither uninstructive nor uninteresting if I direct your attention to a very few of the numerous valuable communications on pharmaceutical subjects that have been brought forward during the last twelve months, though as I have hinted, it is impossible for me to offer any fair *résumé* of them in the few brief moments at my disposal.

Howard's *Quinology of E. I. Plantations.*

First let me notice the continued labours of Mr. John Eliot Howard on the chemistry and physiology of Cinchona, of which good proof is presented in his recently published *Quinology of the East India Plantations*, a copy of which is on the table. In this fine work, the author discusses a variety of subjects connected with the culture of Cinchona in India, such as the acclimatization of the various species, the elevation above the sea-level at which the culture proves most successful, the effects of protecting with moss the stems from which the bark has been removed, the mode in which the bark is renewed, and the chemical constitution of the wood and leaves of Cinchona. The so-called *mossing process*, which simple as it is, seems likely to play an important part in Cinchona-culture, consists in covering with moss the portion of stem from which a strip of bark has been carefully removed.[1] The wood thus laid bare exudes a delicate cellular tissue, having the aspect of minute gelatinous drops, which gradually increasing and hardening, ultimately forms a continuous layer of new bark :—and now comes the interesting fact that this new bark is richer in alkaloids than that which it replaced ; and bark of the second renewal is richer than that of the first, and of the third than that of the second. "Is this state of things," says Mr. Howard, "to last and become permanent, so that by continually stripping the trees of portions of their external covering it should become in the same proportion more rich in the very product that we need ? This seems very improbable, yet it is the conclusion to be arrived at from the above experiments."

The increase of alkaloids, let me observe, is not trifling but in extreme cases is almost double. It is also stated that bark

1 The *entire removal* of the bark from a stem is a destructive practice never adopted in India.

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the third time renewed is better fitted for the extraction of quinine than normal bark, and yields the alkaloid in a state in which its purification is singularly easy.

Broughton on *Cinchona succirubra.*

Mr. Broughton, whose assiduity in this field of research continues unabated, made experiments on two trees of *Cinchona succirubra,* which showed that when the trunks were deprived of light for some months by being covered with tinned plate or black cloth, the amount of alkaloids increased 50 per cent.; the proportion of quinine, however, remained almost stationary, the increase being in the shape of cinchonine and cinchonidine. In bark renewed under moss, an improved proportion of quinine is found.

Madder.

The cultivators of madder are in the habit of covering up with earth the lower portion of the stems of the plant, finding by experience that deprivation of light tends to develop the peculiar colouring matter for which the plant is valued. It has been observed by Decaisne in examining microscopically the roots and stems of madder, that the cellular tissue of the former contains a yellow liquid, while the latter is filled with green colouring matter; and he has been able to prove by experiment that it is possible to change at discretion the production of chlorophyll and to cause the elaboration of the colouring matter of the root in its place. It happens in this case, observes Mr. Howard, that the green portions which when exposed to light, absorb the carbonic acid of the air whilst disengaging oxygen, absorb, on the contrary, when deprived of light, the oxygen of the atmosphere which surrounds them and replace it with carbonic acid. Does not something analogous take place in the red bark tree, the shading of the stem of which is attended with such manifest advantage?

Madras report.

In Mr. Broughton's *Report to the Madras Government,* the following interesting fact is related:—among the Crown-bark trees (*Cinchona officinalis,* L.) raised from seeds collected by Mr. Cross, there were observed to be a few having narrow, lanceolate leaves and a somewhat different aspect from their companions. A comparative analysis of the bark of these two forms of Cinchona (growing side by side and raised, as it would seem, from the same

lot of seeds) afforded this interesting result,[1]—that that of the tree with lanceolate leaves contained 8 per cent. or nearly 3½ times as much alkaloids as that of the neighbouring trees of ordinary *Cinchona officinalis*, nine-tenths of these alkaloids being quinine, while in the others *less than half* was quinine. No finer quality of Cinchona bark for the quinine manufacturer has probably ever been met with. 1869.

M. Lefort has rendered a good service by communicating to the Society of Pharmacy of Paris, the result of a comparative examination of the ipecacuanha of Brazil and of that imported of late years from New Granada. It will be perfectly in the recollection of many of you that since about 20 years, the price of ipecacuanha has advanced 200 to 400 per cent., a circumstance due partly to the increasing rarity of the plant and the necessity of seeking it in regions more and more remote, and partly, it is said, to the stock of the drug being in few hands, and the trade being thus virtually something of a monopoly. This high price of the Brazilian ipecacuanha has naturally stimulated a search for the drug in other parts of tropical South America and has led to its collection in New Granada. Yet the drug of New Granada is not precisely similar to that of Brazil nor is its botanical origin well established;[2] and questions have been raised as to whether it may be legitimately employed, some authors supposing it to be *weaker*, others *stronger* than the Ipecacuanha.

[1] Mr. Broughton's analysis of these barks may be thus stated :—

	Bark of tree with lanceolate leaves.	Bark of adjoining trees of *Cinchona officinalis*.
Quinine	7·15	2·06
Cinchonine and Cinchonidine	0·85	2·42
Total of alkaloids per cent.	8·00	4·48
Sulphate of Quinine obtained crystallized	7·37	*undetermined.*

[2] The true ipecacuanha-plant is not known to occur in New Granada; for although in the description of the plants collected by Humboldt and Bonpland, *Cephaelis ipecacuanha* is enumerated as from the mountains of San Lucar in New Granada (Kunth, *Synopsis Plantarum*, iii. 35), the indication must be regarded as doubtful. My friend M. Triana, himself an explorer of the country, has at my request sought for the San Lucar *Cephaelis* in the herbarium of Kunth in Paris, but found that it does not contain any authentic specimen of that plant.

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Ipecacuanha.

indubitable ipecacuanha of Brazil. To determine the question of strength, M. Lefort has endeavoured to ascertain how the two drugs compare in their richness in emetine. Pelletier and Dumas having shown that emetine produces an almost insoluble precipitate with tannic acid, M. Lefort availed himself of this fact to determine the amount of precipitate obtainable by this reagent from the soluble matter of a given weight of root. The mean of his experiments showed Brazilian ipecacuanha to yield 14·49 per mille of tannate of emetine and New Granada ipecacuanha 13·4 per mille. The curious fact that a nitrate of emetine is but very little soluble, though sulphate, hydrochlorate, phosphate and acetate are very soluble, afforded a means of checking these results, and warrant the conclusion that the ipecacuanha of New Granada is rather less active than that of Brazil. A second paper by M. Lefort on the preparation, properties and composition of emetine is well deserving the attention of those desirous of studying this alkaloid.

Herb drying.

The indigenous plants of which the herbaceous parts are in common use in medicine in this country, are few in number, but important by reason of their potency as remedies. The English druggist, unlike his continental brother, has no large herb-room to keep in order; and the drying of herbs which he may have to superintend, is generally performed on a very small scale, if at all. Yet when henbane, belladonna, digitalis or conium are required for making their respective tinctures, and the leaves have to be stripped from the stems and dried, the desirableness of such a process must have often seemed questionable. Such at least have been my feelings: I have wondered whether the henbane with its leaves exuding a clammy secretion from every hair, and its heavy narcotic odour, can be in nowise deteriorated by being subjected for hours to the heat of a drying stove? Whether conium, the active principle of which is a volatile liquid, loses none of its potency by a similar process? The same questions have occurred long ago to others, and the ex-

Expressed juices.

pressed juice of certain medicinal plants, preserved by the addition of alcohol was recommended nearly thirty years ago by Mr. Edward Bentley and Mr. Squire.

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The British Pharmacopœia has recognised the value of such medicines, and has given formulæ for the preserved juices of scoparium and of conium, both excellent preparations, the latter especially being superior to any tincture prepared from a dry ingredient, whether leaf or fruit. It has been reserved, however, for a Belgian apothecary to investigate the subject in a thoroughly scientific manner, and to point out in what way and to what extent, the dried medicinal plant differs from the fresh. The late Dr. Schoonbroodt of Liége has done this, and has published in the *Journal de Médecine de Bruxelles*[1] the result of his researches on twenty-nine different plants, concluding his essay with some general remarks, of which I may cite the following:— Preserved juices, B. P.

That dried plants never completely represent the same plants when fresh. Nevertheless it is possible for new and useful constituents to be developed during the process of drying, as in the case of valerian, which when fresh contains essential oil but no valerianic acid; this, however, is an exceptional instance, the reverse being much more frequent. Dried plants.

That plants suffer by drying two kinds of alteration; firstly, the loss of a portion of their volatile constituents; and secondly, an oxidation of their fixed constituents and of the remainder of their volatile. This oxidation is, in the author's opinion, in great part due to the structure of the dry vegetable tissue, which in its porosity resembles spongy platinum or carbon, and perhaps partakes of some of the gas-condensing power of those substances. The result of this action exhibits itself very decidedly in the case of valerian: when fresh, it contains no valerianic acid but an oxygenated essential oil, which by the action of the air and alkalies, is slowly converted into valerianic acid. It also contains another volatile hydrocarbon, which resinifies very slowly in the air. By the act of drying however, this formation of valerianic acid which even in the presence of an alkali is so slow, and this very tardy resinification by exposure to the air, are very materially hastened. Alteration by drying.

[1] Vol. 45 (1867) p. 162 etc.; vol. 46, (1868) p. 62. A German translation has appeared in the *Vierteljahresschrift f. Prakt. Pharm.* 1869, p. 73, and an abstract by Mr. Maisch in the *American Journ. of Pharm.* and *Pharm. Journ. and Trans.*

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There is found in fact, in dried valerian a comparatively large amount of ready-formed valerianic acid, the presence of which is evidenced by the strong smell of the drug, while the fresh root is devoid of odour and contains no resin.

Fresh plants.

The author further observes, that it is always advantageous in the preparation of alkaloids and other active principles to employ the fresh plants, and as far as possible to conduct the operations thereto belonging at a low temperature. Alkaloids are thereby obtained in a condition more favourable to crystallization; the loss, often considerable, resulting from decolorizing by charcoal is avoided, and recourse to chemical reagents for their isolation, or rather to free them from the products of their own alteration, is dispensed with.

As to the drying of medicinal herbs, the author remarks that the oxidising influence of the air being the principal cause of deterioration, it is desirable that the operation should be performed as rapidly as possible and that the herb should be compressed into a compact mass, after the manner pursued by the American herb-dryers.

Aconitine.

The *Pharmaceutical Journal* for last September contained a warning regarding the purity of aconitine, which has not received all the attention in this country that it seems to deserve. It was to this effect,—that English aconitine, or at all events a sample received from London as such by Mr. Merck, of Darmstadt, was found to possess chemical and physical characters very different from those recognized as proper to true aconitine. It was but slightly soluble in ether, and much less soluble in alcohol than pure aconitine, and dissolved with difficulty in chloroform. In boiling water it did not become soft and plastic but remained pulverulent; from boiling alcohol it could be readily crystallized. Notices contrasting so-called *English* and *German* aconitine have appeared in many of the Continental journals; and it seems to be accepted as a settled fact that in England *aconitine* signifies something very different from what it does abroad. But so far as I have observed, this assumption is far too sweeping: at least I have found that aconitine in my possession manufactured in London by houses

of repute (and what I examined had been purchased long before attention had been called to the subject) had precisely those properties which are characteristic of the true alkaloid. The chemistry of aconite, a most difficult subject, is now occupying the attention of some of our best pharmacologists, and their labours cannot fail to make plain some points in its history hitherto obscure. 1869.

In the suggestive list of *Subjects for Papers* which our secretaries do not fail annually to bring before us, there has been for years included a catalogue of vegetable alkaloids each of which for one or several reasons, requires further investigation. One of these, *Buxine*, is the subject of a very interesting memoir by our esteemed member Dr. Flückiger, an abstract of which, with some new matter, he has been good enough to prepare for our meeting. I shall be glad if some other of our members will undertake to reduce this list. Buxine.

The adulteration of olive oil is a subject that has often claimed the attention of chemists, and the diversity of the tests proposed indicates how difficult it is to detect the sophistication of this important production. The increase in the manufacture of soap in some of the cities of southern Europe has led to the importation of a variety of oils and oil-seeds which have presented strong temptations to tamper with the oil shipped as *olive oil* to foreign countries. For the benefit of any of our members who may feel disposed to work on such a subject, I may mention that a prize of £600 is offered by the Chamber of Commerce of the Department of the Alpes Maritimes for a prompt and easy method, not involving a chemical process, of recognizing the mixture of seed-oils with olive-oil. Olive oil.

Our indefatigable colleague Dr. Attfield has during the past year communicated many practical and useful observations on pharmaceutical subjects, one of which I will here briefly recall to your memory.

Precipitated Sulphur.—Notwithstanding that attention has been repeatedly called to the desirableness of supplying this drug in a pure form, it appears that the calcareous *Milk of Sulphur*, consisting of about 34 per cent. of sulphur with 66 per

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Milk of Sulphur.

cent. of sulphate of lime, is still very generally sold. In justification it is said that the public prefer the impure article as being whiter and more easily miscible with water, that it is the true *lac sulphuris* of the Pharmacopœia, *sulphur præcipitatum* being a distinct preparation;[1] to which I may add another consideration (too far fetched, let us hope, to be real), that the first is but half the price of the second. It is hard to combat popular prejudice, and sometimes impossible for a druggist to convince his customer that one article is less adapted to his requirements than another. I have heard a person require the rankest and most offensive cod-liver oil in preference to what was sweet and new; and have even known an ointment that was old and rancid habitually preferred to that which was freshly made. Yet in proportion to the amount of confidence reposed in the knowledge, skill and fidelity of the druggist, so will the public accept his judgment in matters pertaining to his own art; and even a druggist's dictum that pure sulphur is better than sulphur and plaster of Paris, will come to be admitted as reasonable.

Our art, gentlemen, is ever progressive. All science is interesting for us, since almost every scientific discovery may sooner or later, directly or indirectly, yield some result profitable to pharmacy. Let us not therefore neglect our opportunities, but identifying ourselves with the general advancement of knowledge, let us strive to improve by every means in our power that branch of the healing art which it is our province to cultivate.

[1] It was true that the *sulphur præcipitatum* of the Pharmacopœia of 1746 was ordered to be made with sulphur, lime and sulphuric acid; and the *lac sulphuris* of that of 1721, with sulphur, lime *or salt of tartar*, and sulphuric acid. But it is questionable if the chemists of that period were aware of the essential difference of the products obtained, according to whether a lime or a potash-salt were decomposed with sulphuric acid, for Pemberton in his *Dispensatory* 1746 calls the preparations "*similar*," but says that the one "*will not look so white*" as the other.

PHYTOLOGICAL SOCIETY.

(*Read to the Phytological Club, 14th April*, 1858.)

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Most persons who have rambled among beautiful natural scenery are able to recall certain times of special enjoyment, when a combination of agreeable circumstances has contributed to produce an impression which increases rather than diminishes in the lapse of time. To the botanist, days of this sort are not unfrequent. Fine weather, agreeable companions, interesting plants and picturesque scenery furnish him with sources of gratification which are by no means transient.

What young botanist could forget gathering for the first time *Cypripedium calceolus* or *Orchis hircina?* Who could not be struck with the beauties of *Pinguicula* and the Sundews?

Though I am sensible how little the enjoyment of such occasions can be conveyed by description, I have ventured to jot down a few memoranda of an occasion which has left a vivid impression upon my own mind, and I will now read to you my

Recollections of a Day's Botanizing on the Col de Lautaret.

On the road between the towns of Grenoble and Briançon and about eighteen miles from the latter, in the Department of the Hautes Alpes, and in the Canton of La Grave, lies the little alpine village of Villar d'Arène. It is a poor, bleak, desolate-looking place, with but little traffic through it, and for several months in the year buried in snow. It possesses, however, a church, and what to the botanist is much more essential, a humble village inn.

Villar d'Arène.

Here on the 26th June 1857, accompanied by my friend S——, I had the satisfaction of experiencing the primitive hospitalities of the landlady, Madame Clot.

Rose early the next morning and after a hearty breakfast left Villar d'Arène at a quarter past six with empty botanical boxes and other suitable rig for a hard day's botanizing in one of the finest localities in all France. The weather was magnificent, and so I may add was the scenery, especially after one had proceeded some little distance from the village.

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On the right were the vast precipices crowned by the Glacier de la Grave, whose masses of ice and snow shone with dazzling lustre in the early morning sun. On the left lay the grand and sterile range that separated us from Piedmont, while between the two, and constituting a wide undulating valley, which although treeless was beautifully verdant, was the Col de Lautaret, the grand botanical locality we were ambitious to explore.

Col de Lautaret.

Eager for plants my attention was soon attracted by the bright yellow flowers of a crucifer which proved to be *Sisymbrium Austriacum*.

A little further on, growing in a lovely little hollow was a perfect nest of treasures,—*Anemone narcissiflora*, *A. alpina*, *Trollius Europæus*, *Caltha palustris*, *Narcissus poeticus* and *Pedicularis incarnata* being among the more interesting, besides which I must mention as conspicuous for its fine yellow flowers and deep green leaves, *Orobus luteus*, a plant which it had not been my good fortune to meet with before.

But it is needful to describe a little the nature of the ground which was producing so many good plants, for out of Dauphiny I may say I think I never met with a similar locality.

The Col de Lautaret is, as I have said, a wide valley, but it is far from being a dead level; on the contrary, upon leaving Villar d'Arène, the road (which is a good one) constantly ascends, until it reaches its culminating point in the summit of the Col, an elevation of 6,869 feet above the sea-level, or more than twice the height of our own Ben Lomond. The surface of the valley is mostly made up of pasture, which differs in a most interesting manner in the nature of its vegetation. Here, in a comparatively sheltered spot of a few acres, one has to walk knee-deep through *Narcissus poeticus*, *Paradisia Liliastrum*, *Trollius Europæus*, *Asphodelus albus*.

A little further on, where the scanty soil barely conceals the naked rock, occur *Anthyllis vulneraria*, *Oxytropis montana*, *O. campestris*, the beautiful yellow-flowered *Gregoria vitaliana*, *Astragalus aristatus*, the fine *Trifolium alpinum*, with great pink flowers so unlike any ordinary clover as at first sight to lead one quite off the scent in conjecturing its name.

1858.

Profusion of botanical specimens.

In moister places appear *Orchis globosa*, *O. conopsea* and *O. nigra*, the flowers of the last remarkable for their deep red colour and vanilla-like odour, and still more so for the singularity of their having the labellum uppermost, a character which has caused them to be separated into a distinct genus named *Nigritella*. Here also we find along with our familiar *Geum rivale*, the much smaller though not less conspicuous *G. montanum* with golden yellow flowers, *Asphodelus albus*, *Phyteuma orbiculare*, *Ranunculus aconitifolius*, *R. aduncus*, *Gentiana lutea*, *Polygonum viviparum*, *Ajuga pyramidalis*, while among the herbage, and not very easily distinguishable, is *Botrychium Lunaria*.

In certain places a more peaty soil prevails, and with it a number of plants still different—foremost among them and not soon to be forgotten, are the splendid blue gentians, *G. verna* and *G. acaulis* abundantly enamelling the short turf. *Primula farinosa*, *Soldanella alpina*, *Androsace carnea*, *A. obtusifolia*, *Pinguicula alpina* and *Ranunculus pyrenæus* and in places from which the snow had but lately disappeared, a few plants of *Crocus vernus* were still in flower.

Amid such a profusion of interesting plants, the difficulty is to *collect little enough*, for botany boxes are by no means of unlimited capacity; and the botanist under such trying circumstances finds it necessary (except in the case of plants, really small) to relinquish all thoughts of liberality to absent friends and to restrict his gatherings to specimens just sufficient for his own herbarium.

Experience has shown me the value of careful packing in the botany box, occasional sprinkling of its contents and the necessity of a well-fitting lid—little precautions which tell materially upon the condition of plants gathered during a long midsummer day.

But to return to the Lautaret. After rambling about for some hours, but still directing our course towards the highest part of the Col, we diverged to the right in order to reach some patches of snow and rough stony ground, and afterwards to climb a steep rocky slope, the spur in fact of one of the mountains bounding the western side of the valley. Proceeding on our way the dull purple flowers of *Anemone vernalis*, most of them

1858. rather too much advanced, attracted my attention—then *Daphne Mezereum* still in flower, and *D. striata*, a beautiful alpine species with pink flowers altogether much resembling *D. Cacorum*—here also was *Rhododendron ferrugineum*, displaying its fine crimson flowers.

In a damper spot were the curious *Androsace pubescens*, forming a sort of compact crust of green dotted with little pink stars, *Pyrethrum alpinum*, *Arabis bellidifolia*, and two or three other crucifers, whose imperfect state prevented our determining. Among some sloping loose rocks grew *Empetrum nigrum*, and mixed with it that rare plant *Lloydia serotina* and the rare *Saxifraga biflora* and *S. retusa*, and higher still on the ledges of some precipitous rocks which prevented our further ascent grew *Primula latifolia*, *P. viscosa* and *Apidium conchitis*. Here, or in a similar locality, we also gathered *Bellidiastrum Michelii*, a plant so like an overgrown daisy as to make one hesitate to take it, but which the presence of *pappus* proves at once to be no *Bellis*.

The Hospice of the Lautaret.

Descending once more to the lower ground we gathered *Gagea Liottardi* and *Gentiana punctata*, the latter a fine species with yellow flowers, and then proceeded to make our way to the Hospice, where by a previous agreement we had arranged that a vehicle should overtake us and convey us on to Briançon. The Hospice of the Lautaret was founded by Humbert II., Count of Dauphiny, but at present it is no longer a religious house. It is a low, one-storied, stone building standing on the summit of the Col. The view from it is very fine: the Montagne d'Oursine 13,123 feet above the sea-level, rises magnificently on the S.W.; from the glacier at its foot originates the Guisanne, a river flowing south, while the Glacier de Tabouchet to the S. is one of the sources of the Romanche which runs north.

The hospitality of the Hospice is of rather a humble character. The low doorway, which is the common entrance for the inhabitants and their cattle, conducts by a dark and filthy passage into a sort of cow-house or stable on the one side and into the kitchen on the other. In the latter, a massive stone apartment dimly lighted by small windows sunk in its thick walls, we found

the operations of the laundry busily going on, while over a fire of cow-dung made upon the hearth, some potato cakes were being fried. Nothing in the shape of food being under the circumstances to be despised, we soon communicated our wants and accepted what cheer the house could afford. 1858.

Quitting the Hospice we took a stroll in its immediate vicinity, noticing among its out-buildings the rude sledges used in winter-time, and also remarking the long poles on each side of the road, erected to indicate its position when buried in snow.

At three o'clock in the afternoon our vehicle having arrived, we continued our journey towards Briançon by a steep descent down the valley of the Guisanne to Monestier. Thence to Briançon the road is along the valley, which is populous and fertile, though still bounded by lofty mountains on either side. Briançon.

Briançon is a fortress of the first class, commanding the passage into Italy, whence it is only an hour or two distant. The town stands on an elevation of 4,285 feet above the sea, and is said to endure seven months of winter.

So much for a day's botanizing on the Col de Lautaret.

A CHEMIST'S HOLIDAY. JOTTINGS IN FRANCE.

(*Pharmaceutische Ferientage. Ausflug nach der Dauphiné.*)

(*Read at the Bath Meeting of the British Pharmaceutical Conference, Sept.* 1864.)

MANY of us when boys must have read with delight the charming little tale called *Eyes and no Eyes*,[1] in which the narration of a country walk is made the occasion of showing how an observant mind may derive instruction and pleasure from objects which in the non-observant excite no interest. 1864.

As I have neither been able to accept one of the subjects proposed by the Pharmaceutical Conference for investigation, nor to take up any other, and am yet unwilling to appear before you empty-handed, I am driven to the expedient of producing my essay from the same kind of materials that afforded

[1] By Dr. Aikin and Mrs. Barbauld.

1864. the narrative of "*Eyes;*" and will therefore read you a few memoranda bearing as far as may be on pharmacy, made after a month's ramble among the Alps of Dauphiny.

Paris. Leaving London, in the latter part of July, in company with a friend, I spent two days in Paris, visiting while there the École de Pharmacie, which, I need hardly remind you, is an establishment of ancient growth, and is much more extensive than our own school in Bloomsbury Square. Besides museum, and laboratories, it possesses a small botanical garden, which is overlooked by the residence of the veteran pharmacologist, Professor Guibourt, Lecturer on the Natural History of Drugs. The professor's private collection is very extensive, and occupies several small rooms in the upper part of a house in an adjoining street, where we had the pleasure of meeting him, as well as Professor Planchon, of the School of Pharmacy at Montpellier. I may remind you that Paris, Strasburg, and Montpellier are the centres of French pharmaceutical education, these three cities alone possessing Superior Schools of Pharmacy.

Jardin des Plantes. We next visited the Jardin des Plantes, which is not distant from the École de Pharmacie, and spent some time in inspecting the zoological and botanical collections in the museums. In the garden itself I observed in a sheltered situation against a wall a fine pistachio-tree, with nuts of full size, produced, I was informed, after artificial impregnation, the male tree growing at some distance. Conducted by M. Naudin, we also examined some of the rare *Cucurbitaceæ*, for which the garden is famous, as well as a series of beds in which curious experiments on the hybridization of plants were being carried on. A call at the busy establishment of Dr. Mialhe, pharmacien to the Emperor, and a brief visit to the large and bustling wholesale house of M. Dorvault concluded all that could be called *pharmaceutical* in my visit to Paris; and I shall therefore pass at one jump to

Grande Chartreuse. the Grande Chartreuse, that famous monastery near Grenoble, founded by St. Bruno in the eleventh century, and of which our London *Charterhouse* was originally a branch. I need not here tell of the magnificent alpine scenery amid which the monastery is situated, nor of the austere habits of the monks, nor of the

primitive style of bed and board with which visitors to the establishment are entertained. But I wish to relate to you the beneficial effect to the institution of a little pharmaceutical knowledge. 1864.

Previous to the French Revolution of 1789, the convent had large landed possessions, all of which were confiscated during that convulsion, and the monks expelled for a period of over twenty years. However, in 1816, the Grande Chartreuse was restored to its owners, but without the restitution of its lands, —the only privilege allowed being the right of pasturage and of cutting wood in the circumjacent forest. But the monks had another resource: they made some excellent cordials and an elixir of wonderful virtue, both distilled from the aromatic plants growing on the alpine pastures. They invented also a tooth-tincture, and a certain preparation of iron, known under the name of *Boule d'acier;* and these have become sources of revenue almost equal in value to the houses and lands lost by the Revolution. The liqueurs or cordials, in particular, are in universal demand, and bring an income, it is said, of nearly £20,000 a year. The composition of these liqueurs, of which there are three kinds, the green, the yellow, and the white, is not known. Balm, wormwood, a small pink, and the buds of a fir, are said to be ingredients, but there are probably several others,—among which I could fancy, judging from the taste of the yellow liqueur, there might be *Astrantia* and *Meum*, both common plants in the meadows round the Chartreuse. Cordials and Elixir.

The subalpine woods of this part of Dauphiny produce the spruce fir (*Abies excelsa*, D.C.), the source of genuine Burgundy pitch, which, however, is not collected, though it easily might be, as one sees it streaming from the tree-trunks on all sides. The silver fir is also common: it yields, I may remind you, the rare and fragrant Strasburg turpentine, once official amongst us, under the name of *Terebinthina argentoratensis.* This turpentine is obtained by puncturing small swellings in the bark of young trees, and allowing the single drop of clear turpentine which exudes from the puncture, to run into some small vessel held below to receive it. The Scotch fir is also found in some Firs.

1864. districts, and what is remarkable, the common mistletoe grows upon it, in preference it would almost seem, to the apple-trees which are sometimes in near proximity.

Colchicum. The common colchicum, I noticed in many places throwing up its purple flowers among the green herbage of orchards and meadows; and in a few alpine situations, I also gathered *Colchicum alpinum*, D.C., a species with flower and corm of much smaller size.

Actæa spicata, L., a rare plant in England, is found in the mountain woods near Bourg d'Oisans; and its root, which I dug up and dried, is so like that of the American *Actæa racemosa*, L., that I do not think one could distinguish them.

Our English foxglove was nowhere seen in Dauphiny, but the yellow *Digitalis grandiflora*, All., and the small white-flowered *D. lutea*, L., were of frequent occurrence. Henbane, I often noticed, especially near Briançon, where it was very fine by the roadside.

Lavender, the genuine plant of our English gardens, is very abundant in some parts of the country, growing in profusion on the rocky hillsides, but no use appears to be made of it. Many

Labiates. other beautiful labiates are also seen, of which hyssop, with its bright blue flowers is one of the more rare. The great yellow gentian was nearly past flowering at the time of my visit, but it was still conspicuous in many an alpine pasture, as was also the white hellebore (*Veratrum album*, L.), a plant affecting similar situations. *Arnica montana*, L., was also nearly out of flower, but it must be a splendid ornament of the mountain meadows in the earlier summer. In many of these meadows, I may mention that grass seems quite a subordinate constituent, so thickly is the ground covered with other plants.

Briançon. Proceeding to Briançon, that little mountain city on the confines of Italy, we were struck with the appearance of the numerous small trees of the Briançon plum (*Prunus brigantiaca*, Vill.), the branches of which were often thickly clustered with fruit, still far from ripe. The tree is indigenous to this part of France and is not an object of cultivation. Its fruits, which are hardly eatable, are gathered in the autumn for the sake of their

kernels, which yield by expression a fatty oil, considered by the peasants a useful medicine both for man and beast. I bought some of it, and found it to have an agreeable flavour and a slight odour of bitter almonds; further than that it was "*très-bonne pour la colique*," I could not gain any very definite idea as to its virtues. 1864.

Briançon manna.

Briançon, however, has another pharmaceutical interest, in the *manna* which old writers relate is, or can be, collected from the larches that grow in its vicinity. The larches certainly are there, and very interesting it is to see them growing truly wild on their own native mountains.

During a visit to Briançon in June 1857, I made particular examination of the larches on the neighbouring hills, and obtained so little evidence of anything like saccharine exudation that I was ready to conclude the formation of such a substance must be of rare and exceptional occurrence. Subsequently to this, however, M. Berthelot, of Paris, actually made a chemical examination of Briançon manna, and demonstrated it to contain a peculiar variety of sugar, which he designated *Melezitose*, a name derived from *melèze*, the French for *larch*.

Melezitose.

Larch Manna.

Here again in the country of the larch and in the very classical locality for the manna it was necessary of course to renew the previous fruitless research, and my travelling companion felt equally interested in the inquiry. A day or two before we reached Briançon, we had examined larches at La Grave a few miles distant, but not a trace of saccharine exudation could we discover. There was a little white aphis on the leaves of several trees, just as one often sees upon the larch in England; and upon examining the insect carefully, one could perceive a minute globule attached to one part of it. Was this the manna? or had it anything to do with it? Here was a globule of something, but too small to collect, or even to taste *per se*:—still in our desperation we licked the aphis-coloured leaves, and fancied they had a faintly saccharine taste. The cones certainly had an exudation, but it was turpentine to all intents and purposes,—fine clear drops of genuine Venice turpentine; and a botanist of Briançon assured us a day or two after that this was the manna. As I could not,

1864.

Manna *in situ* at Chantemerle.

however, believe that M. Berthelot had mistaken turpentine for sugar, I commenced making further inquiry and fortunately applied to M. Turin, an intelligent pharmacien, who at once assured me that Briançon manna was no myth, but a saccharine substance to be actually found on the foliage of the larch. M. Turin stated that in the height of summer and in the early part of the day, the larches in the forest (or at least some of them—I did not understand the remark to apply to all) were really whitened with the manna, as if there had been a sprinkling of snow,—a thing, remarked the worthy pharmacien, that was "vraiment belle à voir." M. Turin further added that the manna had nothing in common with turpentine, or with the aphis we had noticed on the leaves. In reply to my eager inquiry, if there was still a chance of seeing the manna *in situ*, and what locality for it was most accessible, M. Turin directed us to the village of Chantemerle, near which there was a mountain abounding in larches, and added that on some of them it was possible we might still find the manna. Though we had engaged to leave Briançon at an early hour, we determined first to make the expedition suggested by M. Turin, and accordingly drove to the village of Chantemerle, near which we found larches in abundance, but manna was not equally obvious. A careful search, however, of the foliage of the trees revealed here and there a little tear of white sugary matter, encrusting the needle-like leaves. This was all the ocular evidence of manna we could obtain; but on returning to the village, an old peasant whom we accidentally met, assured us that it was useless to search for the manna except in the cool of the morning, and that moreover the season for finding it was almost over. He promised, however, to speak to the shepherds on the mountain, and obtain through them a little of the substance, if any could still be found. The old man kept his word, and through him I received at Grenoble a fortnight afterwards, a good specimen of the larch manna, a portion of which I have now the pleasure of exhibiting.

Collection in the early morning.

Seeing my interest about the manna, the old peasant asked me if I knew what he called *Génipi;* and on my professing ignorance he ran home to get some. It turned out to be an

Génipi.

Artemisia, which is collected on the mountains, and held in high estimation as an aromatic bitter. 1864.

Another production of the same neighbourhood is a sort of talc, once official under the name of *Craie de Briançon*, but now chiefly used as "boot powder," and for taking out greasy stains.

Wild fruits near Briançon.

Near Briançon, the common gooseberry occurs very plentifully in a wild state. Its fruit, though not larger than a pea, and rather hard and bristly, has an excellent flavour, and the plant is doubtless the progenitor of the gooseberry of our gardens. It is rather curious how many other of our fruits may also be noticed in this part of France, either wild or semi-wild. The vine, apple, pear, medlar, quince, raspberry, cherry, and two species of currant are all to be seen in greater or less abundance. The currants, however, are specifically distinct from our garden *Ribes*. In the alpine meadows the chive (*Allium schænoprasum*, L.) is very frequent, and in August its pink flowers are ornamental among the green grass. In England it is only known as a potherb, which is also the case with savory (*Satureja montana*, L.), which I found on the dry hills of the Val de Queyras. In this valley I also gathered savine, which I had previously seen nowhere else. Here, however, it is very plentiful, covering the rocks with a scrubby vegetation, and diffusing slightly its characteristic odour.

Dauphiny.

Dauphiny abounds in mineral wealth, including that most precious of all minerals, coal. It also possesses several medicinal springs, that of Uriage, six miles from Grenoble, being the most frequented. The water is sulphuretted alkaline, issuing from its source slightly warm. It is both drunk, and used for baths. There is also at Uriage a ferruginous spring, the water of which is brought to the *table d'hôte* in decanters and drunk with wine by those who require a mild chalybeate tonic.

These, gentlemen, are the pharmaceutical memoranda of my pleasant ramble, which came to a conclusion soon after I left Uriage. I have offered them to you in default of a grave and learned paper, and hope they may have afforded, if not amusement or instruction, at least a proof of my interest in the welfare of the British Pharmaceutical Conference.

MEMORANDA ON SOME FORMULÆ IN THE BRITISH PHARMACOPŒIA.

(*Vorschriften der Brit. Pharm.*)

1865.

In the formula for preparing *Mistura Ferri composita*, a few small alterations suggested by experience appear worthy of notice, and although attention has already been drawn to one of them, the moment seems opportune for again referring to the subject.

Myrrh in lumps.

The first point I would notice is the *Myrrh*, which (as often stated) should not be *in powder*, as the long desiccation required for reducing it to that state deprives it of much of its aroma. A piece of fine lump myrrh answers better; there is, moreover, an advantage by allowing the myrrh to soften by contact with the water during some hours, before the emulsion is completed. This emulsion is usually kept ready prepared, the sulphate of iron being added when the mixture is required to be sent out. As no chemist would probably prepare for stock less than a pint of it, I would adapt the formula to that quantity. According to the British Pharmacopœia, each fluid ounce of the emulsion requires $3\frac{3}{4}$ grains of sulphate of iron: it would be rather more convenient to reduce this proportion to $3\frac{1}{2}$ grains to the ounce. the mixture of the London Pharmacopœia being $2\frac{1}{2}$ grains.

With these changes, the following would be the formula for

Mistura Ferri composita.

MISTURA FERRI COMPOSITA.

℞ Ferri sulphat. grs. 70.
Potass. carb. grs. 60.
Myrrhæ,
Sacch. āā drms. $2\frac{1}{2}$.
Sp. myrist. fl. drms. $2\frac{1}{2}$.
Aq. rosæ, q.s

Triturate the myrrh and carbonate of potash with the sugar and sufficient rose-water to form a thin paste. Set this aside for twelve hours; then continue the trituration, gradually adding rose-water and the spirit of nutmeg, so as to form 20 fluid ounces

1865.

of a uniform emulsion, which preserve. When required for use, add the sulphate of iron in the proportion of 3½ grains to each fluid ounce.

Mucilago Tragacanthæ.

The next formula respecting which I would offer a few words, is that for *Mucilago tragacanthæ*. This preparation is rarely wanted, and never, I believe, kept ready prepared. It is, moreover, much too thick, and twenty-four hours is a longer time than can generally be allowed for its preparation. If a mucilage containing tragacanth only is required, which in the presence of so convenient preparation as the compound powder is very questionable, the following formula will be found to afford a good result.

MUCILAGO TRAGACANTHÆ.

℞ Gum. tragacanth. pulv. grs. 60.
Aq. dest. fluid ounces 10.

To the water contained in a pint bottle add the tragacanth, agitate briskly for a few minutes and again at intervals until the gum be perfectly diffused, which will occur in about five or six hours.

SOME REMARKS ON THE NOMENCLATURE OF THE PHARMACOPŒIA.

"Pharmacorum nomina, sæpius licet absurda, sancte servavi, utpote complurium seculorum auctoritate, ratione legibusque exempta."—*Linnæus.*

1865.

Professor Redwood.

Some months ago, there was presented to the Pharmaceutical Society by Professor Redwood, a very interesting paper "On the Construction of a Pharmacopœia,"[1] one of the objects of which was to invite suggestions for improvements in a proposed new edition of that work. As almost every pharmacist must have made in the course of his experience some useful observations respecting one at least of the 600 drugs and preparations which the pharmacopœia specifies, it is to be hoped that Professor Redwood's invitations may receive many replies. For one, I beg permission to offer a few remarks on the nomenclature of

[1] *Pharm. Journ. and Trans.* May, 1865.

1865.

Nomenclature of vegetable drugs.

some of the drugs derived from the vegetable kingdom. It may seem a rather trivial subject upon which to descant, yet it commonly happens that upon the publication of a pharmacopœia the first strictures that appear have reference to changes in nomenclature, which seem the inevitable concomitants of each new edition. Nor is this unreasonable, for the name of a drug is often known and used when nothing else is known about it, and the convenience and suitableness of a name are points upon which all feel able to give an opinion.

Professor Redwood has touched on this subject in the following judicious remarks:—"It appears to me desirable, as far as possible, to avoid the use of chemical names or symbols that are liable from time to time to be altered as new views in chemical science prevail. Frequent change in the names applied to medicines is in itself an evil. The most important objects to be attained are, that the names shall be familiar, concise, and explicit, easily pronounced and used both in English and Latin, consistent one with another, and not inconsistent in their signification with those used for other purposes. Names already in use, if they fulfil these conditions, are preferable to new names."

Names in accordance with Science.

It happens unfortunately that many names which are both familiar and concise, are not accordant with modern knowledge, and hence has arisen the feeling that alteration is necessary. The teacher who imparts botanical knowledge shudders to hear squill spoken of as a "*Radix* scillæ," or caraways as "*Semina* carui," when he is using his utmost endeavours to explain that *bulbs* are not *roots*, and that the so-called *seeds* of umbelliferous plants are in reality *fruits*. Yet terms such as these arein constant use among druggists, and are sanctioned by all the older writers on Materia Medica. The more exact definitions, however, having already existed many years in the Pharmacopœia, it would, in most cases, be a retrograde movement to discard them in favour of the older and more popular designations. Let us then accept the *bulbs* of squill, the *corms* of colchicum and the *fruits* of umbellifers as a token that pharmacists do not ignore botany.

Condensed titles.

In many cases, however, the designation of the special part of the plant which is to be used is neither customary nor necessary,

1865.

while in others it is necessary, in order to avoid confusion, or to comply with pharmaceutical usage. In the London Pharmacopœia of 1836 brevity was carried to its utmost limit, the old pharmaceutical names employed in previous editions being often so shorn as to render them neither elegant nor explicit. Thus, cajeput oil was termed simply *Cajuputi;* gum arabic, *Acacia;* poppy heads, *Papaver;* pomegranate peel, *Granatum;*—while *Quercus*, which the dictionary tells us signifies *an oak*, was held to mean *oak bark*.

Edinburgh Pharmacopœia, 1817.

In amusing contrast with this excessive condensation, are the terms employed in the Edinburgh Pharmacopœia of 1817, the authors of which seem to have been impressed with the necessity of each name containing the whole truth, no matter how inconvenient it might be to write it. Hence we find cajeput oil under the name of *Melaleucæ Leucadendri Oleum volatile;* oil of cloves under that of *Eugeniæ Caryophyllatæ, Oleum volatile;* mace is called *Myristicæ Moschatæ Involucrum nuclei*, and cascarilla, *Crotonis Eleutheriæ Cortex*.

Nomenclature to be preferred.

In the British Pharmacopœia, extremes such as these have to a large extent been avoided; but it is still obvious that some greater regard to the usage of pharmacists would impart a practical character to the work. I would not propose to return to the old rule of designating in every case the part of the plant of which each drug consists, for terms such as benzoin, assafœtida, or cubebs are in themselves perfectly explicit. But it would be preferable to say *Belladonæ folia*, instead of simply *Belladona*, especially as we have also *Belladonæ radix*. *Arnicæ radix* is more definite than simply *Arnica; filix mas* than *filix; Quercus cortex* than *Quercus; Cassiæ pulpa*, than *Cassia; Acaciæ gummi* than *Acacia; Colocynthydis pulpa*, than *Colocynthis*, &c. Some of the names are also open to exception in other ways:—why should *Ipecacuan* be substituted for the more euphonious *Ipecacuanha*, when the latter is the true Brazilian name and is used by the best writers, as well as universally in commerce? Can a good reason be given for changing *Guaiacum* to *Guaiac?* the old term *Matico* might also be restored, for it forms as good a Latin noun as *Bucco*, and

1865. is in accordance with its derivation,[1] which the feminine "*Matica*" is not. But in making these criticisms it must be admitted that in the large majority of cases the names employed in the British Pharmacopœia have been well selected, and are as free from objection on the score of ambiguity or inconsistency as any names can be.

In the selection of names to be used, as well as in the introduction of new formulæ, or the omission of old, it appears to me that more regard should be had to existing custom and practice. Thus names that are familiar and in constant use should not be hastily changed; medicines that are hitherto unknown should not make their first appearance in a pharmacopœia; and old medicines which are in daily employment should not be suddenly discarded, or have their composition materially altered.[2]

NOTES ON PRESCRIBING.

(*Receptirkunst.*)

1867. The Pharmacologia of Dr. Paris.

ALTHOUGH more than fifty years have elapsed since the learned Dr. Paris placed before the medical profession his observations on the theory and art of medical combination, it may safely be asserted that nothing has been since written on the same subject more replete with sound and accurate information.

Yet every year adds to our experience: not only are new drugs introduced, but new combinations and new forms of administration are also adopted; and the prescriptions of the present day differ as much in character from those that found their way to

[1] *Matico* is the diminutive of *Mateo*, the Spanish for *Matthew*, that having been the name of the soldier to whom tradition ascribes the discovery of the styptic property of the drug.

[2] As illustrations of these latter propositions may be mentioned the introduction of oil of elder flowers into the London Pharmacopœia of 1836; the omission of compound extract of colocynth from that of 1851; the alteration in the composition of the steel wine and ipecacuanha wine in the pharmacopœia of 1824; and the augmentation of strength in the *Liquor Ammoniæ acetatis* of that of 1864.

1867.

the druggist's counter half a century ago, as do the medicines then in vogue from those which are now in use.

The art of prescribing, it must be admitted, is not a subject coming precisely within the province of the pharmacist, yet the pharmacist is necessarily acquainted with the methods of prescribing which are prevalent, and is more capable than any other person of judging of the merits of formulæ under pharmaceutical and chemical aspects.

Undesirable prescribing.

It has long appeared to me that some of these methods or modern phases of prescribing call for notice in the pages of the *Pharmaceutical Journal*, and in the hope that the subject may be further handled, I have thrown together the observations here presented. Some of the formulæ that I shall quote will afford evidence that the precepts of the author of the *Pharmacologia* and the rules of chemistry are too little observed, and that the duties of the private dispensary performed by many of the older physicians while practising as apothecaries, enabled them to avoid the errors and eccentricities into which some of their successors occasionally fall. The result of mixing the ingredients ordered in a prescription is sometimes very unexpected, so that even the most practised dispenser is often unable to predict whether certain given ingredients can be united into a compound that shall be suitable for administration :—and if the pharmacist whose time and skill are chiefly devoted to the mixing of drugs is thus at fault, it is hardly surprising that the physician, whose mind is mainly directed to other subjects, should sometimes prescribe ingredients that it is impossible to combine, or that if combined, cannot be taken, or are devoid of the required efficacy.

For convenience I shall place my remarks under different heads, and shall notice firstly

Unchemical formulæ.

UNCHEMICAL FORMULÆ.

As an example let us take the following :—

℞ Barii chloridi gr. iss
Ferri sulphatis gr. ij
Extracti gentianæ q. s.
Ut fiat pilula.

1867.

Barium chloride rendered inert.

The writer of this formula was a frequent prescriber of chloride of barium which he generally ordered in combination with sulphate of quinine or sulphate of iron, or with both, thereby probably rendering the chloride inert. No reliance could of course be placed on the uniform effects of baryta, prescribed sometimes in a state of activity and sometimes in an inert form.

As another example of this character, take the following prescription which was brought to be dispensed a few weeks ago :

℞ Potassii iodidi ℈i
Potassæ bicarbonatis ℥iss
Ferri et quinæ citratis ℈iv
Tinct. valerianæ ammoniatæ ℥j
Aquæ ad ℥iv
Misce. Sumat cochleare medium ex aquâ ter die.

Fault in prescribing.

In preparing this medicine, the iodide and bicarbonate were dissolved in a portion of the water, to which the tincture was then added. The citrate was dissolved in the remainer of the water and the two solutions were mixed. The result, as might be expected, was that a frothy white precipitate of quina was instantly formed which in a few minutes collected into a coherent mass, sufficiently hard and tough to be rolled into pills.

It may be observed that in compounds such as this, the quina is not subject to the remarkable influence which citric or tartaric acid exerts on peroxide of iron, that of allowing it to be combined with an alkaline bicarbonate or with ammonia, but that it is more or less separated when such alkalies are mixed with it, a fact very often overlooked.

Unsuitable combination.

A third instance of extremely unsuitable combination occurs to me, which from its frequency a few years ago was impressed on my memory, although I have no copy of a prescription in which it was ordered. It was the prescribing of *glacial* phosphoric acid *in pills*, and that in combination with valerianate of zinc !

Formulæ that Give Rise to Unexpected Combinations.—A very interesting fact bearing on this point has been stated in

1867.

a recent number of the *Journal de Pharmacie et de Chimie*.[1] M. Melsens has proved by experiment that pure potassium iodide may be administered to dogs in considerable doses without occasioning any ill effects; and that potassium chlorate in somewhat strong doses is also tolerated when administered continuously for at least a month. Treated with potassium iodate, however, dogs die rapidly. If potassium iodide and potassium chlorate in equivalent proportions are given to dogs, such mixture speedily proves fatal; and yet, as is well known, these salts do not under ordinary circumstances decompose one another. These experiments have an important practical bearing on the art of prescribing, showing that medicines, harmless when administered separately, may become highly deleterious when given in combination.

Unexpected decomposition.

The following case of unexpected change in the composition of a medicine was of actual occurrence. A prescription was written for a mixture of which the more essential ingredients were rochelle salt and calcined magnesia, the one dissolved, the other diffused in peppermint water. The mixture was prescribed and taken without particular remark, until upon one occasion, recourse was had to a bottle which had been prepared some weeks before. The dose was found extremely different from any that had been taken previously; in fact it had so caustic a taste as to excite the alarm of the patient who suspected a serious error on the part of the druggist. The physician was consulted, and finally an analytical chemist was requested to examine and report on the medicine. This resulted in an explanation:—the calcined magnesia, by prolonged contact with the alkaline tartrates, had gradually abstracted their tartaric acid leaving their alkalies in a free and caustic state.

Rochelle salt with Calcined Magnesia.

The dispenser of prescriptions is sometimes puzzled to know what *colour* to make the medicine, the colour being dependent *on the order* in which the ingredients are mixed. For instance, a lotion was prescribed composed of calomel, lime water, and chloride of zinc. If the calomel were decomposed first, the lotion was *black*: if the chloride of zinc first, it was *white*.

Change of colour.

[1] November, 1866, page 338.

1867.

Change of colour.

Lotions in which both chloride and bichloride of mercury are ordered with lime-water, are easily made to vary from yellow to brown or black, according to the order in which the two mercurials are decomposed. A lotion made according to the following formula is either transparent and colourless, or opaque and of a brick red, according to the order in which the ingredients are mixed.

℞ Potassæ chloratis
Boracis āā ʒss
Hydrargyri bichloridi gr. iv
Glycerinæ ℥ss
Aquæ ad ℥viij
Misce.

Ill-contrived formulæ.

Although hardly coming under this section, and rather deserving to be ranged under the head of *ill-contrived formulæ*, may be instanced the following:—

℞ Unguenti hydrarg. nitratis ʒiij
———— cetacei ℥j
Liquoris potassæ ʒij
Linimenti saponis ad ℥vi
Misce. Sit linimentum capiti omni nocte infricandum.

℞ Confectionis opii ʒij
Olei terebinthinæ ʒiss
Sp. ammoniæ aromat. ʒiij
— camphoræ ℥iij
Fiat linimentum.

℞ Potassii iodidi ʒi
Morphiæ acetatis gr. x
Aceti colchici ʒiv
Olei sulphurati ℥i
Misce. Fiat linimentum.

The next subject on which I must beg leave to offer a few remarks is the

Undue Concentration of Medicines.—There is no practice in the modern method of prescribing more fraught with incon-

venience to the pharmacist and risk to the patient, than that of ordering medicines in an excessively concentrated form. The object for doing so is in most cases that the patient may obtain a large supply of medicine at a small outlay;—in others, because medicine in a concentrated form is more convenient for being carried from place to place. That the prescriber should have a due regard for the pocket of his patient and wish to diminish as much as possible the expenses attendant on sickness, is doubtless commendable. But when this is done at the expense of safety and of efficacy, it becomes an abuse which demands rectification.

1867. Concentrated formulæ.

All druggists know that forty or fifty years ago, liquid medicines for internal use were very commonly prescribed in the form of *draughts*, or doses each contained in a single bottle; —that these have gradually been superseded by *mixtures*, containing usually 6, 8, or 12 doses, and that these last are now often replaced by highly concentrated and smaller mixtures technically called *drops*, each bottle of which contains a large number of doses. Most will admit that the dispensing of medicines in the form of *draughts* except in rare cases, involves more labour and expense than are necessary for any purposes of accuracy or convenience. But in resorting to the compounds which are now prescribed as *drops*, we are going to the other extreme. It is a practice of recent introduction and finds no place in the *Pharmacologia* of Dr. Paris, who does not give a single specimen of such a manner of prescribing.

Drops.

As evidence of the objectionable character of prescribing medicine in a very concentrated shape, I shall quote a few prescriptions, all of which I have myself lately observed.

℞ Liquoris strychniæ ℥ij
Tincturæ valerianæ ℨiij
Spiritûs chloroformi ℥j
——— camphoræ ℥iij
Magnesiæ sulphatis ℨj
Misturæ camphoræ ad ℨviij
Misce. Sumat cochleare unum magnum pro dosi.

1867.

Concentrated formulæ.

This mixture is too alcoholic to retain in solution the sulphate of magnesia, which, although first dissolved in the camphor julep, subsequently concretes into a crystalline mass.

℞ Liquoris Donovani ℥viss
Potassæ bicarbonatis ℥v
Tincturæ calumbæ ad ℨiij
Misce. Signa—Forty minims (by measure) in water twice a day after meals.

Here again the liquids are insufficient to dissolve the alkaline salt, which remains at the bottom of the bottle as a dense white powder, not to be shaken up and poured into a minim measure.

℞ Chlorodyne ℥iss
Sodæ biboratis ℥j
Sp. camphoræ
— ammoniæ comp.
— ætheris sulph. āā ℨss
Misce. Take a small teaspoonful in a wineglass of water when required, and repeat the dose every two hours until the pain is relieved.

The addition of the borax to the other ingredients occasions the separation of a sticky mass which adheres to the sides and bottom of the bottle in such a manner that the intended dose cannot possibly be administered; a difficulty which would be entirely obviated had the mixture been ordered in a diluted form.

℞ Hydrargyri bichloridi gr. vj
Liquoris arsenicalis ℥ijss
Tinct. cardamomi comp. ℥iij
Aquæ ℨvj
Misce. Sumat cochleare unum minimum bis die.

℞ Quinæ disulphatis ℥ss
Acidi phosphorici diluti ℥x
Liquoris arsenici chloridi ℨj
Tincturæ ferri muriatis ℥xj

1867.

Concentrated formulæ.

Tincturæ aconiti ʒiij
——— calumbæ ℥iss
Glycerinæ ad ℥vj
Sumat cochleare unum minimum pro dosi.

Medicines prescribed according to such formulæ as this and the preceding, are dangerous from their extreme concentration, and from the large quantity ordered rendering them liable to be mistaken for comparatively dilute mixtures taken in the dose of two or three tablespoonfuls.

℞ Tinct. aconiti (Flemming) ʒij
Sumat gutt. j tertiis horis ex aquæ ʒij

℞ Strychniæ gr. j
Acidi phosphorici diluti ℥j
Sumat ♏ v ex aquæ cyatho vinario ter die

℞ Strychniæ gr. ij
Aquæ destillatæ ʒv
Solve ope
Acidi hydrochlorici diluti ♏iv
et adde
Vini ferri ad ʒx
Misce. Signa—Take ten minims by measure in water every morning before breakfast, and increase the dose every other morning by one minim up to 18 or 20 minims.

℞ Ext. cinchonæ liquidi
Liquoris calcii chloridi āā ℥ss
Fiant guttæ.

℞ Acidi arseniosi gr. ij
Syrupi zingiberis ℥ij
Fiat mistura.

Dangerous concentration.

In the five formulæ above-quoted, the medicines are ordered to be furnished to the patient in (as it seems to me) a form far too concentrated. By the first of them a bottle containing

1867.

Concentrated formulæ.

about 150 doses of the strongest tincture of aconite is supplied with directions that a dose is to be taken every three hours. In the second nearly a hundred doses of strychnine are ordered to be placed at once in the hands of the patient. The third prescribes five weeks' supply of strychnine in a ten-drachm mixture, and is also deserving notice for the complicated directions to the patient for calculating his dose. The fourth is objectionable from the fact that the ingredients are decomposed for want of a suitable excipient, the resin of the bark being precipitated on the bottom and sides of the bottle, so that it is impossible for the patient to obtain the intended dose. No such difficulty would arise if each ingredient were reasonably diluted previous to mixing, and the dose apportioned accordingly. The fifth formula is dangerous from ordering the arsenic to be treacherously disguised in the form of a very palatable syrup, which might in ignorance be taken far too freely.

The experience of any dispensing pharmacist will readily testify that prescriptions such as those here quoted are now-a-days by no means unfrequent. That they are highly objectionable all will allow, inasmuch as in many cases they do justice neither to the patient, the physician, nor the pharmacist. Those of the last category are reprehensible for the sake of the patient who is furnished with a large supply of potent, or it may be even dangerous medicine, which is to be taken for a lengthened period, almost according to his own pleasure and judgment; for the sake of the physician who by such prescriptions must often deprive himself of the opportunity of watching the effect of the remedies he orders; and, lastly, for the sake of the pharmacist, on whom is thrown a heavy risk of error and accident, counterbalanced by no proportionate increase of profit, but actually accompanied by a much diminished scale of remuneration.

Dangers of extreme concentration.

1870.

THE PRICE OF MEDICINES.

(*Chemist and Druggist's Almanac*, 1870.)

Cost of Medicines.

To discuss the various considerations that control the money-value of medicines, compounded according to prescription, is to enter on a delicate question, respecting which it is difficult to take an unbiased view. The compounder, it will be said, is himself an interested party, wishing both to magnify the responsibility and difficulties of his occupation, and to show reason why he should claim a high rate of remuneration. Yet when we are told that remedies prescribed by a physician may now be prepared in a co-operative store, and sold at prices far lower than would be charged in an ordinary pharmacy, it is not inopportune to review the circumstances which govern their cost, or to consider the reasons, if any, that require for compounded medicines a rate of profit widely different from that which would be remunerative in the case of other commodities.

True Standard.

It is a fact not generally understood, that the chief cost of many medicines lies in the time, skill or care required for their preparation, and not in the mere value of the ingredients. The latter are often of small intrinsic value, yet the duty of compounding them should be intrusted to none but a well-informed and careful pharmacist, familiar with the properties of the substances prescribed, competent to identify and ascertain their purity; acquainted also with the best method of combining and presenting them to the patient in a safe and convenient form. These qualifications are *personal;* they are to be acquired only by the expenditure of time and money; and, inasmuch as they are valuable, so they should command adequate remuneration.

Small consumption.

The small consumption of drugs is a circumstance enhancing cost; their use is exceptional, for none will voluntarily take medicine. Still the pharmacist must keep a stock, which, if his business be a good one, may include from 1,500 to 2,000 articles, exclusive of patent medicines, nostrums, perfumes, and cosmetics. Of this number, a large proportion is but in rare demand. A stock which consists of a vast variety of small items, some

1870.

liable to become deteriorated by keeping, requires constant care to preserve in order and efficiency.

Another item of cost to be considered in relation to this question is that involved in house-rent; for the premises of a good pharmacy ought to be light, airy, and commodious, and in all cases to include some apartment fitted up as a laboratory.

A Laboratory necessary to the Pharmacist.

To insure the quality of preparations, and, in some instances, to secure pecuniary advantage, a laboratory, though on ever so small a scale, should be regarded as an integral part of the establishment of the pharmacist. Not that I advocate the manufacture of everything for which a formula may be found in the British Pharmacopœia; however advantageous in theory such a plan of procedure, virtually it is neither practicable nor desirable. Many medicines can be better prepared in large batches than in small; but there are others for which, it is satisfactory to think, manufacture on a small scale offers no disadvantage, so far as quality is concerned. The pharmacist who can say, "*These preparations were made in my own laboratory,*" has stronger ground for claiming remunerative prices than he who supplies his shop with ready-made articles from the nearest wholesale druggist.

Remuneration to assistants.

In the remuneration of his *employés*, the pharmacist has to encounter higher rates of payment than those which prevail in other businesses; nor is this surprising, when we reflect on the importance of the service of a well-trained, intelligent assistant. In fact, the growing desire for improved acquirements is tending to insure for our young pharmacists a more liberal scale of payment than that which their fathers were able to command.

The price of a medicine by no means wholly depends on the value of the ingredients; in fact, there are certain cases in which the sum demanded by the compounder can only be regarded as a professional fee. Take, for instance, a bottle of atropine drops for application to the eye. What is easier than to dissolve a twentieth of a grain of atropine in an ounce of water, and how small the cost; yet what medicine is it more important to prepare with accuracy and intelligence? And who would grudge the modest remuneration asked for in return?

1870.

Inconsistent prices.

The inconsistency of druggists' prices has often been matter of complaint; but with the system of appraising medicines which prevails in this country, it is an evil not easily cured. Medicines are cheap or dear; or, from the trade point of view, unprofitable or profitable, according to no very definite rule. Here is the formula for a box of pills:—

℞ Calomel, gr. x.
Ext. Aloes.
— Colchici, āā. gr. iv.
Opii Pulv. gr. j.
M. Fiant pilulæ iv., quarum sumat unam horâ somni, p. r. n.

I need hardly say that the price that would be charged in most shops for these four pills would be quite unremunerative: and yet the majority of pharmacists would feel themselves precluded *by custom* from asking the sum (still very small) which might fairly be expected for four doses of a powerful medicine.

The rate of prices.

A preparation again, made according to the following formula, would in many houses be supplied at a price which would scarcely cover the inevitable risk of accident which attends the dispensing of dangerous poisons:—

℞ Atropiæ Sulphat, gr. j.
Sp. Æth. Nitr., ʒiss.
Aq. Dest., ʒviss.
M. fiant guttæ. Signa—Three drops three times a day.

As medicines are composed of ingredients varying in cost and number, and in the facility with which they may be combined, it is inevitable, under our present system, that there should be discrepant relations between cost and price; and the experience of the pharmacist will only be that of every trader, that some transactions are more profitable than others.

Fair charges.

But while it is not easy to point out a remedy for the inconsistencies that occur in the price of medicines, it will, I hope, be admitted that neither the safety of the public nor the well-being of pharmacy can be advanced by such a reduction of the price of medicines as the co-operative system would tend to introduce. The responsibilities of the British pharmacist are

1870. at present more than ever weighty. Though a dealer in drugs, his position is no longer that of a mere tradesman; onerous duties are imposed, and ample qualifications are exacted. Under these circumstances, it would be unfair to curtail the moderate remuneration he claims; nor do I believe any such abatement is demanded by either the medical profession or the public.

LETTER TO T. N. R. MORSON, Esq.

(*Late President of the Pharmaceutical Society of Great Britain.*)

4th April, 1860.

1860 The improvement of the Library of the Pharmaceutical Society is an object in which all our London members should feel so much interest that I am sure you will allow me to make some remarks respecting a class of works in which the collection appears to be still very deficient. The class I allude to is that of foreign pharmaceutical journals.

In London it is, according to my experience, no easy matter to refer to some of these works—the Libraries of our Colleges and Scientific Societies not usually comprising them. Such being the case, it is more than ordinarily important that the Pharmaceutical Society should possess complete series, and that such series should be strictly and carefully kept up. It must be remembered that no stock is usually kept of the back-numbers of foreign scientific journals, so that deficiencies are not easily made good:—hence the importance of rigidly enforcing those rules designed to prevent the loss of volumes. although it is, in my opinion, highly desirable that the Library of the Society should be rich in the periodical pharmaceutical literature of *all* countries, yet it is pre-eminently so with regard to the journals published in Germany, of the more important of which I annex a list.

(*List Follows*).

SKETCH OF THE LIFE OF JACOB BELL.

(*Late President of the Pharmaceutical Society of Great Britain.*)

1859.

In the history of Pharmacy in Great Britain the name of Jacob Bell will always occupy a conspicuous and honourable position. With the earliest efforts to found a Pharmaceutical Society in this country, and their ultimate success, with the difficulties that the new Society encountered by the defection of many of its early supporters, with the dangers that arose from internal dissensions and from legislative interference, his name will always be intimately associated.

The removal by death of one to whom more than to any other the pharmacists of this country stand indebted, and by whom in a pre-eminent degree the progress of Pharmacy in Great Britain has been advanced, is an epoch in the history of the Pharmaceutical Society; and the desire will naturally arise in the minds of its members to become acquainted with some of the incidents in the life of one who has been so closely connected with it from its formation to the present time.

Jacob Bell was the eldest surviving son of John Bell, and was born in Oxford Street, in the parish of St. James's, Westminster, on the 5th March, 1810.

John Bell.

The elder Mr. Bell, who was a man of the utmost integrity and benevolence, was a member of the Society of Friends, and most conscientiously desirous of bringing up his children in conformity with the views held by that section of the Christian Church. In the year 1798 he commenced business in Oxford Street, and by his diligent application and unswerving uprightness laid the foundation of the important pharmaceutical establishment with which his name is still associated. After his death, which took place in the year 1849, a short but

1859. most instructive sketch of his early career, from the pen of his son, appeared in the pages of the *Pharmaceutical Journal*.[1]

When between twelve and thirteen years of age, Jacob Bell was sent to the school of his uncle, Mr. Frederick Smith, at Darlington, where he remained for about four years. The establishment of this gentleman had deservedly a high reputation in the Society of Friends, and under the tuition which he there received, aided by his own diligent application, he soon made rapid progress.

Most boys have a horror of themes, but this was not his case; in fact, composition, whether in prose or verse, was his *forte*, even in school-days. Among several early literary productions still preserved is an essay on War, which was written for and gained a prize. This essay, which was composed at the age of sixteen, and extends over 140 pages, is far beyond the average of school-boy productions, and it is remarkable that the views which the young author upholds in it condemnatory of war, were strongly retained by him through life. An essay on Slavery, of above 100 pages, written about the same time, is of considerable merit, and further attests his diligence and his aptness at writing. Another piece of authorship, undertaken in conjunction with his schoolfellow, Lawson Ford, was a MS. periodical, under the whimsical but characteristic title of *Bell-ford* [Bell-Ford] *Gazette*. It was devoted to school news and chit-chat, and was carried on with much humour for some months.

School-days.

Upon leaving school, Jacob Bell was apprenticed to his father's firm, and came to reside at the house of business in Oxford Street. Here his position was like that of the other apprentices and assistants, and he had to take duty with them, even to the Sunday serving and attendance in the shop after the usual hours of business.

Business life.

But although the pursuit of business was thus insisted upon, he was not idle in the matter of self-improvement. At the lectures on Chemistry at the Royal Institution, and on the

A student.

[1] Vol. viii., p. 589.

practice of physic at King's College, he proved himself a diligent student. At a later period he worked at practical chemistry in the house of business in Oxford Street, converting his bedroom into a laboratory, and fitting it with a furnace and other apparatus. 1859.

About this time he also amused himself in leisure hours by the study of comparative anatomy, and especially by the preparation of skeletons of animals, in which, being a nice manipulator, he was very successful. These specimens were mostly prepared on his father's premises at Wandsworth, where bitter denunciations sometimes arose when the odious effluvium of some dead monkey, rat, or porcupine, undergoing its term of maceration, penetrated unbidden the quarters of the family.

Amusements.

But his predilection for animals extended to the living also, and the Zoological Society was therefore an object of much interest with him. It was, however, in horses and dogs that he specially delighted. He was himself an admirable horseman, and as his father's country house was some few miles out of town, he could indulge in the pleasures of riding without interfering with business. At one time hunting was a favourite pastime, but the urgent entreaties of his father, who highly disapproved of such an amusement, induced him to relinquish it. The gaieties of London life had, however, strong attractions, and, as with everything else that he undertook, he entered into them with great spirit.

Drawing.

At school, drawing had been a favourite pursuit, and in order to continue it when settled in London, Mr. Bell used to attend the morning class at Sass's drawing school, and he also received lessons in oil-painting from his friend, Mr. H. P. Briggs, R.A. His taste in this direction was natural; and had he been able to pursue painting as a profession, success would in all probability have attended his efforts. As it was, he saw he could attain only mediocrity. The progress of his fellow-students, who could count their days of study while he could reckon only upon hours, discouraged him, and ultimately caused him to abandon the practice of art. In humorous sketching, however, he was very clever, and many a page of a journal kept in his early days

1859. at Oxford Street, contains illustrations that would do credit to *Punch*. In fact, his keen sense of the ridiculous was innate, and, coupled with an originality of expression, it characterized what he wrote from childhood upwards.

But although drawing was no longer pursued by Mr. Bell as a study, his associations with art were not discarded. Though he could not aspire to be an artist, he looked with admiration upon those whom he felt were more favoured than himself. With such tastes he naturally soon formed the nucleus of a collection, which in after years, when in the possession of more ample means, he enriched by the acquisition of some of the finest productions of the modern school. Of the celebrated works in his collection we may enumerate the Sleeping Bloodhound, the Shoeing, Alexander and Diogenes, Dignity and Impudence, the Defeat of Comus, the Maid and the Magpie, by Sir Edwin Landseer; the Horse Fair, by Rosa Bonheur; the Derby Day, by Frith; James II. receiving the News of the Landing of the Prince of Orange, by Ward; and some delightful cattle pieces, by Lee and Cooper. These, together with some other paintings, in all about twenty, were found, after Mr. Bell's death, to have been bequeathed by him to the national collection. The value of the legacy has been stated, we believe with correctness, at from £18,000 to £20,000.

Collection of Paintings.

But it would be wrong to suppose that it was only as a liberal purchaser that Mr. Bell showed his sympathy for art. His service was perhaps equally important in another way, and that was in placing artists in their proper position with regard to copyright. Regarding the subject from a business point of view, he perceived the full value of the privilege; and, by the advice and assistance which he gave, he enabled artists to claim advantages which they had previously but very partially appreciated.

Art copyright.

In the year 1840, Mr. Bell accompanied his friend Mr. (the late Sir) Edwin Landseer, then in poor health, upon a journey on the Continent. Belgium, the Rhine, and Switzerland, were visited; but arrived at Geneva, Mr. Bell was taken ill, and the travellers had to change their respective positions of patient and

Continental tour.

nurse. The malady was a severe attack of quinsy, producing symptoms very similar to those from which he suffered many years afterwards, when labouring under an affection of the larynx,[1] and it proved so serious that he and Landseer were detained in Geneva six weeks. Under the care of Dr. Coindet, Mr. Bell's health was so far restored, that he was able with his companion to cross the Jura in the snows of December, and, reaching Paris, to witness the solemnities that celebrated the arrival in that city of the remains of the first Napoleon. From Paris they returned to London, arriving there on the 31st December, after an absence of about four months. **1859.**

On the 15th February, 1841, a public meeting was held in London in order to organize an opposition to a bill introduced into Parliament by Mr. Hawes, for the purpose of *Amending the Laws relating to the Medical Profession in Great Britain and Ireland*, inasmuch as the bill in question contained clauses vitally affecting the interests of chemists and druggists. At this meeting a committee was appointed, of which Mr. Bell was a member, and the opposition was carried on so vigorously that Mr. Hawes's Bill.

[1] In a most amusing account which Mr. Bell has left of this journey, he has described in his own peculiar facetious way the sufferings he experienced during this attack ; and they accord so precisely with those which occurred in his last illness, that we have obtained permisson to quote the passage.

. . . . . .

(*Enter the servant to lay the cloth for dinner.*)

B. "What an unfortunate victim I am! I am doomed to endure Benjamin's appetite and Sancho Panza's mortification!"

L. "What do you mean by Benjamin's appetite?"

B. "We are told that when Joseph in Egypt fed his eleven brethren with bread and milk, Benjamin's mess was five times as large as any of the others, and as we are not informed that he left any of it, we may conclude that his appetite was in the same ratio. Those who have seen Leslie's little picture of Sancho Panza at the conclusion of his untasted repast, can imagine what he felt by the expression of his countenance. *I* can imagine it by feeling the same torture myself, and a few inflammatory twitches into the bargain."

L. "Here comes the soup! Try and swallow a little bread sopped in it."

B. "I'll make the attempt.————Every mouthful of soup is like a dagger ; a little runs heavily down, and the rest becomes glutinous, and stops the passage until I spit it out. I can take no more ; though I would gladly devour those cutlets, the fowl, and crusty bread in proportion. In fact, I am inclined to be angry with the *garçon* when he takes away the bread which I have not dared to attack ; as an old sportsmen would fain keep his guns, whips, and dogs in his sight, although his sinews have become stiff and powerless, and his activity has fled for ever."

1859. the proposed measure was abandoned. It became evident, however, to many of those who took part in these proceedings, that the *esprit de corps* which had been raised in the hour of danger might be taken advantage of for the formation of a permanent society, and that such a society might interpose a most effectual safeguard for the protection of the interests of the trade, as well as for gradually raising it to the *status* which it occupied in other countries.

Foundation of the Pharmaceutical Society.

The result was that at another public meeting held on the 15th April, the formation of the Pharmaceutical Society of Great Britain was decided upon.

Although this step may be said to have laid the foundation of the society, yet, as is well known to all those who have had experience in such matters, a vast amount of hard work had to be accomplished before the society could be reduced to anything like working order. Rules had to be framed, officers appointed, and even the members, most of them but slightly known to each other, or perhaps almost antagonistic, had to be coaxed into cordial co-operation.

Here the tact and energy of Jacob Bell, who had throughout been warmly interested in the proceedings, became of signal service. In order to keep alive and extend the interest which had been excited, and to promote friendly intercourse among the members of the trade, and those who were disposed to favour the formation of a Pharmaceutical Society, several evening meetings of a social, rather than formal character, were held by invitation at his house in Oxford Street. On these occasions the constitution of the new society was discussed, explanations were given, objections replied to, and a general opportunity was afforded for the interchange of sentiments on various subjects of interest to the pharmaceutical body. To convey to those, who from distance or other causes were unable to attend these meetings, some information of what was taking place, and also to afford a general answer to the numerous inquiries daily received, Mr. Bell published a pamphlet entitled *Observations addressed to the Chemists and Druggists of Great Britain on the Pharmaceutical Society*, which was largely circulated.

Jacob Bell's Pamphlet.

1859.

Rise of the Pharmaceutical Society.

These zealous efforts were attended with success, and the new society increased rapidly both in numbers and importance. It is, however, unnecessary to trace the whole history of the Pharmaceutical Society in order to show how large an amount of its prosperity is due to the labours of Mr. Bell. Let us recollect that he was a member of the council from the commencement of the society to the day of his death, and that hardly any engagement was ever allowed to interfere with his attendance at its meetings. As a member of committees, and of the board of examiners, and as an attender of the evening meetings, his diligence was equally unfailing.

Visits the Provinces.

The formation and healthy active existence of provincial branches of the Pharmaceutical Society was also an object of much solicitude with Mr. Bell; and many a rapid journey did he take when he thought that his presence and advocacy might assist in promoting the objects in view. The kindly and disinterested feeling, and conciliatory spirit he displayed on these occasions, will long be remembered.

Liberality.

Many little examples of his disinterestedness, which was often exhibited in an eccentric way, might be mentioned. One, very characteristic of himself occurred in reference to the copy of Nees von Esenbeck's *Plantæ Medicinales*, which is in the library of the Pharmaceutical Society. The fly-leaf of this valuable work has in it the following memorandum, in Mr. Bell's hand:—

"A member of the council having an offer of this book at about half price, proposed it to the council, and it was resolved unanimously that it was desirable to secure it for the Pharmaceutical Society. It was, therefore, referred to the Library Committee; but in the meantime it was necessary to give an answer, which the member above mentioned did, taking the book and waiting the final decision of the committee.

"When the committee met, the book was rejected; consequently the member of council who was saddled with it, now has the pleasure of presenting it to the Pharmaceutical Society.

"April, 1850."

Another instance in point was the case of his subscription to the Pharmaceutical Society, which he was in the habit of giving

1859. annually, having objected to compound for it. A few weeks before his death, however, he sent and paid his life subscription.

Pharm. Journal.

One of the most useful agents in promoting the advancement of pharmacy in this country, has been the *Pharmaceutical Journal*. The first number appeared in July, 1841, and, with the five succeeding numbers, was intended by Mr. Bell as an experiment, to test the necessity for such a journal. At the termination of this period "the influx of scientific papers," to quote his own words, "and various communications from correspondents on subjects relating to the society, had increased to such an extent, that it was found difficult to restrict the dimensions of each number within the prescribed limits. The advantage resulting from a periodical interchange of ideas among the members of the society, became so obvious, that all doubt as to the practicability of maintaining a journal of pharmacy was at an end. The *Pharmaceutical Journal and Transactions* was, therefore, continued with regularity, remaining under the superintendence of Mr. Bell until the completion of the eighteenth and last volume. The disinterestedness with which he pursued this labour for eighteen years is very remarkable. From the low price at which the journal was supplied to the society it was never, notwithstanding its large circulation, a source of income; on the contrary, until the last three years, when through advertisements and increased sale it about paid its expenses, the deficit which he had to make up varied from £30 to £60 per annum.

Editorial Life.

For the office of editor his literary tastes, general acquaintance with science, and ever-ready pen, proved important qualifications. Nor should we omit to add the happy wit and conciliatory tone that pervaded his editorial articles. As editor, Mr. Bell constantly contributed the leading articles, which appeared, as is customary, without their author's name. Many papers, however, upon purely practical subjects, were furnished by his pen, and bore his name; and his last communication, which was not published until after his death, was a paper on Concentrated Infusions and Decoctions.

Previous to the existence of the *Pharmaceutical Journal* we

find him an occasional contributor to the *Lancet*. A letter, signed *Pertinax*, published in that journal 11th Feb., 1837, containing some capital practical criticisms on the capricious changes of nomenclature introduced into the Pharmacopœia of 1836, was from the pen of Jacob Bell. A second letter, on *The New London Pharmacopœia unsuitable for its proper purposes*, appeared in the same journal Aug. 17, 1839. 1859.

These professional labours were not unappreciated by the pharmacists of other countries, and Mr. Bell was an honorary member of various foreign scientific societies, of which we may enumerate the Philadelphia College of Pharmacy, the Société de Pharmacie de Bruxelles, the Société de Pharmacie d'Anvers, the Société d'Emulation et de Prévoyance des Pharmaciens de l'Est, le Cercle Médico-Chimique et Pharmaceutique de Liége, the Medico-Physical Society of Erlangen, and the Sociedade Pharmaceutica of Lisbon; he was also a Fellow of the Chemical, Linnean, and Zoological Societies of London, and of the Society of Arts. Honours.

The incorporation of the Pharmaceutical Society by Royal Charter, which took place in the year 1843, though an acknowledgment of the importance of the interests of pharmacy, did not convey those powers and privileges which might enable the Society to exercise its proper influence in restricting the practice of pharmacy to persons duly qualified. Nothing short of an Act of Parliament could do this; and to obtain such an act, the strenuous exertions of the Society were directed. Pharmacy Act.

In December, 1845, we find Mr. Bell thus defining the leading objects of such a measure:—

"1. The registration of all persons carrying on business as chemists and druggists.

"2. The introduction of a regular and uniform education for our body throughout the country.

"3. The examination of all persons who may hereafter enter the business.

"4. The protection of the public against the proceedings of ignorant persons assuming the title and office of pharmaceutical chemists.

1859.

Attempt to gain a Government Bill.

"5. The separation of the trade in medicines from the practice of physic and surgery, as far as this is practicable.

"6. The recognition of the Pharmaceutical Society as the governing body in our department, represented by a council annually elected from among the members at large; having power to superintend the education, examination, and registration, and to make such regulations as may be requisite from time to time respecting other matters relating to pharmacy, in which the interests of our body and the welfare of the public are concerned."[1]

During the year 1846 the subject of pharmaceutical legislation was much discussed, and numerous petitions to Parliament in favour of some measure to promote education among the dispensers of medicine were presented. In July of the following year it became evident that, owing to the pressure of other business and the position of the Government in reference to a dissolution of Parliament, the hopes that were entertained of a Pharmaceutical Bill being passed during the current session, would not be realized.

Obstacles to Pharmaceutical Legislation.

A deputation of the society to the Secretary of State in the following November again urged the subject upon the Government, which, although admitting its importance as a branch of medical reform, declined to take it up as a separate question.

Obstacles continued to impede the progress of pharmaceutical legislation. Mr. Warburton, who had undertaken to bring forward the subject in the House of Commons, left Parliament, and no member having similar experience in medical affairs appeared to succeed him. The difficulty was to get the subject brought before Parliament by some one perfectly familiar with all its details, and at the same time possessing zeal, industry, and determination sufficient to neutralize the apathy and distaste with which it was regarded by many members of the legislature.

The accomplishment of this object had long occupied the attention of Mr. Bell, and as a solution of the difficulty, he at length resolved to offer himself as a candidate for a seat in Parliament, and so acquire as a right the opportunity of advocat-

[1] *Pharmaceutical Journal*, vol. v. p. 245.

ing in the House of Commons the subject he had so much at heart. But he had as yet never been much interested in politics, and, strange as it may appear, he was so little versed in political affairs, that he actually did not know with which party his principles would lead him to associate. However, upon the death of Mr. Raphael in November, 1850, and the consequent vacancy in the representation of St. Albans, Mr. Bell decided upon offering himself as a Liberal candidate for that borough. 1859.

But the "free and independent electors" of St. Albans were by no means disposed to accept the first candidate that offered, and thus forego so interesting an occasion as a contested election. A rival candidate in the Conservative interest was therefore brought forward; and although upon the election that took place on the 24th December, 1850, Mr. Bell was returned by a considerable majority, the unscrupulousness of the means employed by his agents upon that occasion was such that a petition was presented which led to the ultimate disfranchisement of the borough. These proceedings were ever after a source of regret to Mr. Bell, and were the occasion at the time of many unpleasant reflections being cast upon him. But in the opinion of those most fully acquainted with the circumstances he was more sinned against than sinning. That he showed a laxity in placing himself so fully as he did in the hands of his parliamentary agent, we cannot deny. But we are convinced that his doing so was a consequence of his ignorance of electioneering practices, and that had he been any other than a novice at political life he would have exercised to a much greater extent that prudence which he was wont to display under other circumstances. St. Albans.

The great object with which Mr. Bell had entered Parliament was to secure an act for the regulation of pharmacy; and in June, 1851, we find him moving for leave to bring in a *Bill to Regulate the Qualifications of Pharmaceutical Chemists, and for other purposes in connection with the Practice of Pharmacy.* This was granted; the Pharmacy Bill was introduced and read a first time. But the able and zealous advocacy of Mr. Bell was not sufficient to convince the House of Commons of the necessity M. P.

1859. of the measure, and although the bill was read a second time this was done only upon condition that it should not be pressed forward during the then present session.

Political life. Nothing daunted with his want of success, Mr. Bell, early in the session of 1852, again moved for permission to bring in a *Bill to Regulate the Qualifications of Pharmaceutical Chemists.* Although opposed by the late Mr. Hume, permission was obtained, and the Pharmacy Bill of the former session, in a somewhat altered form, was read for a first time. Upon the occasion of the second reading, which took place 17th March, Mr. Bell in presenting a number of petitions in favour of the bill, explained in a speech of some length the objects and provisions with which it had been framed, and at the same time refuted the erroneous impression that the measure in view was designed to create a trade monopoly. In conclusion, he moved for a Select Committee to which the bill might be referred. To this proposition the House acceded not unwillingly. It was a favourable opportunity for delaying a measure that was regarded with some suspicion; it afforded the means of acquiring additional information; and last, but not least, it gave opportunity for the introduction of innumerable alterations, technically, though often incorrectly, called *amendments.* The Select Committee held several sittings, and received evidence from physicians, surgeons, general practitioners, and pharmacists, the result of which showed that pharmacy in Great Britain was in a state contrasting very unfavourably with that in which it was existing in other European countries. But though all seemed to point to the necessity of some legislative interference, the contrary view was taken, and the bill, instead of being rendered more effective, was deprived, to a great extent, of those provisions which were calculated to render it a practical and important measure.

The Select Committee.

Mr. Bell was deeply disappointed. The bill was no longer that which he had introduced, but it was all that the Government would assent to; and the question was between it as "amended" by the Committee, and—none. The former alternative was preferable. The bill fell far short of what it was hoped might be obtained, but it was a legislative measure in the right direc-

tion, and perhaps a prelude to one that promised greater efficiency. 1859.

Such were the arguments that Mr. Bell used at the eleventh annual meeting of the Pharmaceutical Society. The members present concurred with them, and it was the unanimous opinion that every exertion should be used to pass the bill. The result is well known: the *Act for Regulating the Qualifications of Pharmaceutical Chemists* passed both Houses of Parliament, and finally received the royal assent, 30th June, 1852. The Pharmacy Act, June 30, 1852.

Upon the dissolution of Parliament, and the General Election in the summer of 1852, Mr. Bell offered himself for the representation of Great Marlow, but was not successful. In 1854, upon the death of Lord Dudley Stuart, he contested the borough of Marylebone with Viscount Ebrington, but also without success; although upon this occasion he polled more votes than the successful candidate had polled at the previous election. When in the present year he was solicited to offer himself for the same borough, and with every prospect of being returned without opposition, his health was such that he was compelled reluctantly to decline the honour.

But though a Parliamentary career did not open to Mr. Bell, his interest in public matters allowed him to lead no useless or idle life. With the exception of a short visit to Paris in the year 1855, and the tour of a few weeks on the Continent in 1856, he scarcely ever left London for more than two or three days at once. To this unceasing occupation, and utter forgetfulness of his own bodily powers, must be attributed the long and gradual decline in his health, which was unhappily terminated by death in June last. The commencement of the malady which proved so serious, may be traced back as far as the year 1854, when having to address several public meetings on the occasion of the Marylebone election, he contracted an ulceration of the larynx, from which he never thoroughly recovered. Failing health.

The latter part of last year found Mr. Bell in an exceedingly precarious state of health; and although he always steadily refused to try the effect of wintering abroad, he acceded to the wishes of his physicians so far as to spend several weeks at

1859. Hastings. His complaint, however, had too strong a hold; not only were the old symptoms unimproved, but debility and emaciation were added to them. He continued, however, to be actively occupied; the proceedings in Parliament with reference to the sale of poisons bill he watched with the utmost vigilance; the meetings of the council of the Pharmaceutical Society he still attended with regularity, though unable to speak louder than in a whisper; an exhibition of his pictures for the benefit of the Marylebone Literary and Scientific Institution, of which he was President, was organized during his sojourn at Hastings. In May he removed to Tunbridge Wells, where he had the pleasure of unexpectedly renewing a friendship of childhood, in frequently meeting the estimable incumbent of Trinity Church, the Rev. Edward Hoare. On the 18th May he presided at the anniversary meeting of the Pharmaceutical Society, for which occasion, being unable to speak, he had prepared an admirable written address. At the meeting of the council held on the 1st of June he again presided, but it was for the last time. Harassed with cough and debilitated by want of nourishment, which the diseased state of his throat prevented him from taking, his feebleness increased day by day. His mental activity, however, remained unimpaired, and so little did he regard his weakness, that up to the last he did not keep his bed or desist from writing and conversation. But the vital powers were fast ebbing, and upon the evening of Sunday, the 12th of June, he expired. His remains were interred in the cemetery of Tunbridge Wells, in a spot which he himself selected, adjoining the grave of the late Dr. Golding Bird.

Latest exertions.

Death.

Character. On reviewing the life of Jacob Bell, cut short, alas! at the early age of forty-nine years, there are many points of interest that present themselves to our consideration. Blessed with more than average natural abilities, these innate advantages were developed by a good education. His natural taste for the fine arts was carefully cultivated, and when he had the means of gratifying it, he did so with intelligence and judgment. An early training in business gave him practical experience in the affairs of life, and also strengthened his habits of industry and perseverance.

1859.

Energy was natural to him, and whatever he undertook, even from childhood, he pursued with spirit. Another feature of his character, though but little known, was exhibited in his numerous acts of private benevolence, and few who have experienced his benefactions will forget the sympathy and delicacy with which they were administered. But in these, as in other cases, he would take no credit to himself, or care to place himself to the best advantage; hence his motives sometimes failed to be fully appreciated. Those who knew him best, however, can testify to the uncommon disinterestedness that marked his conduct upon all occasions, and which was remarkably exhibited in the happy tact and conciliatory manner with which he treated those questions that occasioned a difference of opinion.

Private benevolence.

Mr. Bell's genial good-nature, ready wit, and happy conversational powers, his taste for literature and science, and extensive patronage of art, had gained for him friends from all circles of society. But though all deplore his loss, it is by his pharmaceutical brethren that it will be most deeply and practically felt. For them he laboured assiduously and disinterestedly, and that for a period of eighteen years; and it is to his energy, wisdom, and perseverance that the advance which pharmacy in this country has happily undergone, is largely attributable.

Personal loss to Pharmacy.

But little as we are disposed to underestimate the loss which the Pharmaceutical Society has sustained in the death of one who has devoted the best energies of a life to its service, we yet reflect that at no other period of its existence could such an event have occurred when its effects would have been less serious. Thanks to the unremitting labours of its late President, the necessity for pharmaceutical education, and the true position of those engaged in the practice of pharmacy, are now recognized by all, and whatever changes the Society may have to undergo, the utility and importance of its objects are such as insure for it the position of a necessary institution of the country.

THE LATE PROFESSOR GUIBOURT.

1867.

The Pharmaceutical Society of Great Britain has lost one of its more eminent members in the person of Nicolas Jean Baptiste Gaston Guibourt, the venerable professor of the School of Pharmacy of Paris, who died on the 22nd of August at the advanced age of seventy-seven.

Life and occupations.

Commencing his pharmaceutical studies at the age of fifteen, M. Guibourt was awarded five years later the first prizes (two gold medals) for chemistry and pharmacy offered by the School of Pharmacy, and about the same time was named *élève interne* at the Pharmacie Centrale des Hôpitaux Civils, from which post he was gradually advanced to those of Assistant Director and Chef des Magasins. After more than ten years' connection with the administration of the civil hospitals of Paris, M. Guibourt was received as *pharmacien*, and forthwith established himself in business in the Rue Richelieu, then called the Rue Feydeau. In 1832 he was named Titular Professor of the Natural History of Drugs of the School of Pharmacy of Paris, and in 1854 became secretary to the same establishment, the onerous duties of which post he performed with assiduity for more than twenty years. Having abandoned the practice of pharmacy at the time he accepted this office, M. Guibourt came to reside at the School of Pharmacy, which continued to be his abode until last year, when the infirmities of age induced him to retire.

Last illness.

M. Guibourt's last illness was rapid. On the evening of the 20th of August he was present at the sitting of the Pharmaceutical Congress, which he addressed in an animated manner, and it was expected he would be able to take part in the discussions of the larger international assembly that was about to meet on the following day. But symptoms of indisposition had set in which increased in intensity the following day, proving fatal to the venerable patient, who expired on the morning of the 22nd without pain and in full consciousness to the last.

The death of M. Guibourt, as may be easily supposed, threw the deepest gloom over the assembly of pharmacists then

1867.

sitting in Paris, who to the number of 140 testified their respect for his memory by accompanying his remains to the church in which the funeral service was performed.

Work, and writings.

Professor Guibourt was named a Knight of the Legion of Honour in 1846, and in 1863 was promoted to the grade of Officer; he was also a member of the Imperial Academy of Medicine, and of many learned societies of the Continent. But honourable as were these titles, still more so was the reputation he derived from its numerous and valuable writings. In 1820 he published in two octavo volumes his *Histoire Abrégée des Drogues Simples*, a work which passed through three editions, re-appearing a fourth time in 1849-51 in an enlarged form, under the altered title of *Histoire Naturelle des Drogues Simples*. Professor Guibourt was also author of a *Pharmacopée Raisonnée*, the first edition of which was published in 1828 in conjunction with the late M. Henry. Two subsequent editions, dated respectively 1834 and 1841, were from the pen of M. Guibourt alone. Nor was he less industrious as a contributor to the periodical literature of pharmacy, for we find that between 1814 and 1867, there are but three years in which his busy pen failed to present the result of some observations to the pharmaceutical public. But if the year 1861, which was one of these three, supplied no communication from M. Guibourt, his elaborate memoir on the estimation of morphia in opium, published in the beginning of 1862, abundantly explained why his silence had been longer than usual. This memoir, which extends over 70 pages, has been printed as a separate pamphlet, and is one of the most interesting and valuable records of its author's labours on a single subject. Numerous samples of the opium of Turkey, Egypt, Persia, India and Europe were submitted to examination with results that served to prove that morphia is a much larger constitutent of that drug than had been commonly stated or than is even at the present time admitted. Of twelve specimens of commercial Anatolian opium analysed by M. Guibourt, none afforded less than 9·60 per cent. of morphia or 11·70 from the same opium when dried; while the richest

Estimation of morphia in opium.

1867.

sample yielded 18·24 per cent. from soft, or 21·46 from the opium when dried. The mean of the analyses showed a percentage in morphia of 12·37 from soft opium or 14·72 from dried. The most productive opium examined was some collected at Puchevillers in the department of the Somme, which when deprived of moisture, afforded no less than 22·88 per cent. of morphia. M. Guibourt's essay concludes with the recommendation that opium for use in medicine should contain from a minimum percentage of 10·20 to a maximum of 12·75 of morphia, or when dried from 12 to 15 per cent.[1]

Labours.

But earnest and constant as were M. Guibourt's labours for the advancement of scientific pharmacy, he was by no means satisfied with the amount of time he could devote to his favourite pursuits, as may be gathered from the following lines, part of a letter written in 1860 to a friend in London: ". . . . Pour moi, je n'ai plus le tems de rien faire; je rencontre à chaque instant des sujets d'étude qui mériteraient un long examen; j'y jette un regard curieux et je les abandonne faute de pouvoir continuer. J'aspire au moment où je pourrai me libérer des occupations qui me sont imposées par l'Ecole de Pharmacie; mais quand ce moment arrivera, me restera-t-il assez d'activité et d'aptitude pour me remettre aux études commencées?"

Longings after leisure.

A careful, judicious, elaborate style of research, embracing a subject under all its aspects, and a style of writing remarkable for precision, gravity and elegance characterized M. Guibourt's labours, and will render his works of permanent value.

[1] The new French Codex requires that soft Smyrna opium should contain *at least* 10 per cent. of morphia.

Review of a Memoir of the Lady Ana de Osorio, Countess of Chinchon and Vice-Queen of Peru (A.D. 1629-39), *with a Plea for the Correct Spelling of the Chinchona Genus.* By Clements R. Markham, C.B. F.R.S.,

1875.

"*The Academy*," April 3, 1875.

THE introduction into India, and the successful cultivation upon a large scale in that country, of the most valuable medicinal tree produced on the Continent of South America, is one of those triumphs of enterprise of which the second half of the present century may well feel proud. To place within reach of millions of the inhabitants of that vast country a remedy of unfailing value, and thus to sow broadcast the seeds of life over districts invaded by fever, is a project the realisation of which will form one of the pleasantest episodes in the history of British rule in India. Considerations such as these confer on the tree whose bark is the raw material of quinine an interest of far deeper significance than attaches to any other medicinal plant; and contributions to its history, whether from a literary or scientific point of view, must be cordially welcome.

Of all those entitled to write on such a subject, no one has a better claim to attention than Mr. Clements R. Markham, for it is to his sound judgment and untiring energy for fifteen years that the widespread and prosperous culture of the tree in India is mainly due.

Doña Ana, Countess of Chinchon.

The personage on whose behalf Mr. Markham now takes the pen is a lady of the seventeenth century, Doña Ana, Countess of Chinchon, a member of a noble Spanish family, tracing back a princely lineage of well nigh a thousand years. Doña Ana was the younger daughter of Pedro Alvarez Osorio, eighth Marquis of Astorga, and was born at Astorga in 1599. In 1615 she became the wife of Don Luis de Velasco, Marquis of Salinas, and went to reside at Seville. But the happiness of her marriage was of short duration, for her husband died in the prime of life in 1619. The young widow, who is said to have been remarkably beautiful, removed to Madrid, where she resided until 1621, in which year she bestowed her hand on Don Luis Geronimo Fernandez de Cabrera y Bobadilla, fourth

1875. Count of Chinchon. Mr. Markham leads one to infer (p. 23) that the widowed countess during her abode in Madrid was attached to the Court of Margaret, Queen of Philip III.; but this must be an error, as the Queen died in 1611.

The Counts of Chinchon.

The Counts of Chinchon, who were descended from an ancient family of Catalonia, derived their title from a small town in the province of Madrid, about twenty-four miles south-east of the capital. Mr. Markham, who visited Chinchon in October, 1866, discourses pleasantly of his trip thither by omnibus from Madrid across a high table-land, intersected by deep valleys of fertile cultivated ground. These valleys, known in Spanish by the name of *vega*, possess a rich alluvial soil, but are by no means healthy, being infected by the germs of ague and intermittent fever. Chinchon itself occupies a hollow in the plateau lying between the *vegas* of Tajuña and Jarama, and is estimated to have a population of 6,000 souls. On the southern side of the town is the old castle of the Counts of Chinchon, once a noble residence, but now a complete ruin, having been dismantled, together with the church, by the French during the Peninsular War.

The Story of Lady Ana.

But to return to the history of Lady Ana. In 1628, that is to say, seven years after her second marriage, her husband, the Count of Chinchon, was nominated Viceroy of Peru; and in consequence of this appointment he proceeded in company with his consort to South America, arriving at Lima on January 14th of the following year. The chief events of the Count's viceroyalty were the rebellion in the Callao, the navigation of the Amazon, and the discovery of Peruvian bark. The last named is described by Mr. Markham in the following terms:—

"But the most notable historical event in this Viceroy's time was the cure of his Countess, in the year 1638, of a tertian fever, by the use of Peruvian bark. The news of her illness at Lima reached Don Francisco Lopez de Canizares,[1] who was then Corregidor of Loxa, and who had become acquainted with the febrifuge virtues of the bark. . . . A Jesuit is said to have been cured of fever at Malacotas, near Loxa, by taking the bark

[1] In Mr. Markham's *Travels in Peru and India* (1862), p. 5, this person is called Don *Juan* Lopez de Canizares.

given to him by the Indians, as long ago as 1600; and in about 1636, an Indian of Malacotas revealed the secret virtues of the *quinquina* bark to the Corregidor Canizares. In 1638, therefore, he sent a parcel of it to the Vice-Queen, and the new remedy, administered by her physician, Dr. Don Juan de Vega, effected a rapid and complete cure." 1875.

The Countess with her husband returned to Spain in 1640—"bringing with her" (to quote Mr. Markham), "a supply of that precious *quina* bark which had worked so wonderful a cure upon herself, and the healing virtues of which she intended to distribute among the sick on her lord's estates, and to make known generally in Europe."

Pulvis Comitissae.

These projects, it may be assumed, she carried out, for it is certain that the powdered bark became known in Europe as *Pulvis Comitissae* (the Countess's powder); while the local traditions of Chinchon and the adjacent town of Colmenar still preserve, even to the present day, as Mr. Markham assures us, the memory of the good deeds of the Countess in ministering to the sufferers from tertian ague in the fruitful but unhealthy *vegas* of the Tagus, Jarama, and Tajuña.

Introduction of the Bark.

There can be no doubt that the cure of a dangerous fever in the person of a patient of such high distinction as the Vice-Queen of Peru had the effect of drawing great attention to the new remedy, and that the employment of the drug in Europe dates from this event. But Mr. Markham might well have added that the use of the bark was largely diffused by the Jesuits, at the instigation in the first instance of the Countess herself—such being the statement of La Condamine,[1] who, after describing the distribution of the medicine by the lady, adds, "*Quelques mois après elle se débarrassa de ce soin, en remettant ce qui lui en restoit aux RR. PP. Jésuites, qui continuèrent à le débiter gratis.*" Among the ecclesiastical patrons of the new febrifuge, the most zealous was the Spanish Cardinal de Lugo, whose pleasure it was to distribute the febrifuge gratuitously among the poor of Rome.

The first four sections of Mr. Markham's work having been

[1] *Mém. de l'Académie Royale des Sciences pour l'Année* 1738, p. 234.

1875.

The Chinchona genus.

devoted to the family history of the Count and Countess of Chinchon, and the fifth to a description of the town of Chinchon and its surroundings, the author in the concluding section sets forth his "Plea for the Correct Spelling of the Chinchona Genus."

"It was not," writes Mr. Markham, "until the French expedition of Condamine and Jussieu to America in 1735, that the forests of Loxa were visited by scientific men, and a few years afterwards Condamine sent specimens of the *quinquina* plant to the great Swedish botanist Linnæus, who was the first to describe it. The name of a new and most important genus was then to be given by Linnæus, and he chose for it the most appropriate that could possibly have been selected, namely, that of the noble lady who had first made its healing virtues known. . . . But most unfortunately, Linnæus was misinformed as to the name of her whom he desired to honour;"—and instead of calling his new genus *Chinchona*, he termed it *Cinchona*, which name has been generally accepted by botanists, from whose diction it has passed into the domain of medicine and chemistry.

It is now several years since Mr. Markham lifted up his voice against this corruption, or, as he terms it in the present work, this "ill-omened mutilation of the Countess's name;" but hitherto, it must be confessed, with but small effect. The new spelling has, indeed, been adopted in the official documents of the Indian Government, but it scarcely finds acceptance in a single scientific work on botany or chemistry.

THE SPICES, GROCERIES, AND WAX OF A MEDIÆVAL HOUSEHOLD, A.D. 1303-10.

(*Posthumous Paper from the Author's Manuscript read before the Pharmaceutical Society, December 4th*, 1875.)

A VOLUME[1] which has just been printed for the Camden Society, is devoted to an *Account of the Executors of Richard, Bishop of London*, A.D. 1303, *and Thomas, Bishop of Exeter*, A.D. 1310, edited from the original MSS. in the possession of the

[1] By the late Ven. Archdeacon W. H. Hale, M.A., and the Rev. H. T. Ellacombe, M.A., F.S.A. Printed for the Camden Society, 1874.

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Mediæval records.

Dean and Chapter of St. Paul's and from the Archives of the city of Exeter.

The accounts mentioned are replete with interesting particulars throwing light on the style of life of wealthy ecclesiastics at the close of the thirteenth and commencement of the fourteenth century; and that relating to the Bishop of Exeter, includes some curious information relative to the consumption of spices, groceries, and wax in a mediæval household. At the period in question, the duty of executor under the will of a defunct person, comprised not only a valuation of his property, but in addition, the production of an account of the money that the property had actually realized.

The *Garderoba* or Wardrobe.

Thomas Button, Bishop of Exeter, died in the year 1307, and the account filed by his executors in 1310, specifies the items contained in the *Garderoba* or wardrobe of the deceased prelate. I will give it in the first place as it stands in the original and afterwards offer some remarks in explanation of the several entries. The term *wardrobe*, it may be well to state, had a wider significance in the middle ages than at present; it was the name of the apartment in which was laid up, not only apparel but valuables of almost every kind. That of Richard, the Bishop of London, contained a considerable collection of books, while that of Thomas, of Exeter, was filled by a profusion of spices and grocery.

[The following shows what was in the Garderoba, and how much money the several articles fetched when sold:—]

		£	*s*	*d.*
1	229 lb. Cere	7	13	3
	423 lb. „ liberatis ad expens. funera . .	14	6	5
	58 lb. „ operate	1	9	1
	3¾ lb. „ liberatis ad expensas familie commorantis post obitum Domini	0	1	10
2	Dj quarterüs et 20 lb. Ammigdalarum venditis .	4	17	6
3	74 lb. Ris	0	13	8
4	77 lb. Sucare	3	17	2
5	3¼ lb. Zinsiberis electi	0	6	6
	20 lb. „ Columbe.	1	3	2
	29 lb. „ communis	1	17	11
6	29 lb. Canele	1	7	7

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	7	2 lb. Galonge	0	10	0
	8	21½ lb. Nigri Piperis	1	3	3
	9	17 lb. Grani Paradisi	1	16	6
	10	38½ lb. Croci	5	9	9
	11	6½ lb. Gariofoli	1	2	3
	12	1¼ lb. Quibibus	0	8	0
	13	2⅝ lb. Macis	0	16	0
	14	6 lb. Feniculi	0	2	9
	15	6 lb. Anisi			
	16	15 lb. Liquiricie	0	1	3
	17	20 lb. Cotun file	0	14	4
	18	4 lb. Orpiment	0	1	8
	19	27 lb. Cymini	0	2	3
	20	3 lb. Pyon	0	0	6
	21	ij gordes de Gyngebrad	1	6	0
	22	iij pixidibus de Gengebrad et Pyonad	0	8	0
	23	ij pixidibus consimilibus liberatis ad expensas executorum	0	5	4
	24	De j libra dimidia Nucis muscate vendita	0	1	6
	25	1 lb. de Zedewand	0	0	10
	26	23 lb. Lichinorum	0	4	0
	27	De iiij Stateris venditis	0	5	4
	28	314 lb. Candelarum Parisie	1	12	8
	29	j vase pro candelis Parisie facta cum appendicüs vendito	0	0	8
	30	De j statera de ferro vendita.	0	1	9

Remarks on the foregoing Account.

Cere Wax. 1. *Cere* [*Cera*], wax. The total quantity in store at the time of the bishop's death was 714 lbs., of which 423 lbs. were consumed at his funeral. At the obsequies of the Bishop of London, in 1303, the expenditure of wax was no less than 1200 lb. The *Cera operata,* of which the account mentions 58 lb., as well as 3¾ lbs. consumed by the family after the death of the bishop, may have been a mixture of wax with tallow, prepared for candles. John de Garlande,[1] who lived in the 13th century, alludes to

[1] Wright, *Volume of Vocabularies*, 1857, 129.

something of the kind when, in speaking of the fraudulent doing of the apothecaries, he says:—"Apotecarii, causa lucri, concumulant confectiones et electuaria, radices cum erbis, zedoarium cum zinzibero, piper cum cimino, gariofilos cum cinamomo, anisum cum maratro, *ceram cum cereis ecclesiasticis.*, zucuram cum licuricia." 1875.

2. *Ammigdalæ* (*amygdalæ*). Almonds.

[Philippe le Bel, date Paris, 1st Feb., 1304, forbade the exportation of various articles of merchandise without permission of his Government under pain of confiscation. But he makes an exception in favour of edible spices and aromatics, the exportation of which is permitted to friendly states. Not to be exported were wine, honey, pepper, ginger, cinnamon, sugar, galangal, *Almonds*, animals' hides, and metals. Almonds.

In the Liber Albus, probable date of list about A.D. 1266, almonds are included as liable to Scavage.

Almonds might be substituted for Pignons (nuclei pinei), in preparing the Pignolat.]

3. *Ris*, in mediæval Latin, *risi*, rice.

4. *Sucare*, sugar.—This commodity at the period under notice used to be imported by way of Italy, from Egypt, Cyprus, and Sicily.

5. *Zinsiber* (zingiber vel zinziber), ginger, is mentioned in the account as of three kinds, namely, *electum*, *commune*, and *Columbe*. The last, which seems to have been of the lowest quality, derived its name *Colombinum*, from Kulam or Quilon, a port in Travancore, whence it used to be shipped. Ginger.

6. *Canele.*—By this term we must understand *Cassia bark*, either of Malabar, or China, rather than cinnamon, which was only beginning to be exported from Ceylon, and was probably much more rare and costly.

7. *Galonge*, galangal.—The value received for 2lb. of this spice is exactly the price of an ox, as reckoned in the account, which states that fifteen oxen were consumed at the bishop's funeral feast. Galangal.

8. *Nigrum Piper*, black pepper.

9. *Granum Paradisi*, grain of paradise, often termed simply *grains*.—The produce of Tropical Western Africa, whence it

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was conveyed by a long land journey to the Mediterranean ports of the Barbary states, and shipped for Italy. It was used in Europe as a culinary spice, of the nature of pepper.

Saffron. 10. *Crocus*, saffron.—There is probably some over-statement in the quantity, which is enormous. The value is represented as equivalent to only 2*s.* 10*d.* a pound; while according to Professor Thorold Rogers, the average price of saffron in England from 1259 to 1350, was about 8*s.* 6*d.*, and from 1351 to 1400, 14*s.* 2*d.* per lb.

11. *Gariofoli* (Caryophylli), cloves.

Cubebs. 12. *Quibibus*, cubebs.—The spice was sold, it will be observed, at a very high rate. In the description of a grand feast, written towards the close of the thirteenth century, by Walter de Biblesworth,[1] we find the following:—

> Au tercez cours avient conyns en gravé,
> E viaunde de Cypre enfundré,
> De maces, e *quibibes*, e clous de orré,
> Vyn blanc e vermayl á graunt plenté.

13. *Macis*, mace.

14. *Feniculum*, fennel seeds.

15. *Anisum*, aniseed.

16. *Liquiricia*, liquorice, at only 1*d.* per lb. Can it have been the extract, or was it only the dried root?

17. *Cotun file*, cotton thread, imported from Italy, and used, according to Professor Thorold Rogers, for the wicks of the better kinds of candles. It is often mentioned in mediæval lists of groceries, as, for instance, in the *Tarif des Péages* of the Counts of Provence, in the thirteenth century, where it appears as *Coton filat.*

Orpiment. 18. *Orpiment*, Auripigmentum, native yellow sulphide of arsenic.—It was used as a pigment in the illumination of manuscripts.[2] In the diploma granted by Chilperic II., King of the Franks, to the monastery of Corbic, A.D. 716, mention is made of a supply of 10 lb. of *Aurum pigmentum*.[3] In another list of

[1] Wright, *Volume of Vocabularies*, 1857, 174.

[2] Theophilus, *De Diversis Artibus*, translated by Hendrie, Lond., 1847, 53, 419.

[3] Pardessus, *Diplomata, Chartæ, Epistolæ, &c.*, Lutet., Paris., ii.(1849), 309.

commodities[1] required for the same religious establishment at a much later period (A.D. 1332 ?) the following pigments are enumerated — *Sulphus*, lb. 10, *Auripigmentum*, lb. 3, *Sanguis Draconis*, lb. 3, *Indium* (indigo) lb. 3. 1875.

Pliny describes the best quality as resembling in colour the finest gold, dry, pure, splitting into thin layers,—a description according exactly with a specimen in my possession. Pliny's description of Orpiment.

19. *Cyminum*, cumin seed, much used in the middle ages as a cheap and common spice.

20. *Pyon*, in Low Latin, *pignolus*, in French, *pignon*, the kernels of the stone pine, *Pinus pinea*, L. In the *Liber Albus* the same article under the name of *pyoine*, and in the *Liber Horn* as *pyoingne*, appears as liable to the king's impost called *Scavage*.

21. *Gyngebrad*, otherwise written *Gingibretum* or *Zinzibratum*, signifies *preserved* or *candied ginger*, a favourite mediæval delicacy imported from India. The exact meaning of the term *gorde* or *gurda*, applied to this article, is doubtful.[2]

22. Three boxes (*pyxides*) of the preserved ginger and, "*Pyonad ;*" the latter is the French *Pignolat*, a confection of fine kernels (see No. 20), with white of egg and sugar. Its modern representative is the sweetmeat called *nougat*, still made in the south of France, especially at the town of Montelimart. Minute directions—"*Pour faire le Pignolat*"—are given by Michel de Nostredame (or Nostradamus), the famous astrologer, in his *Excellent et Moult Utile Opuscule a touts necessaire, qui desirent avoir Cognoissance de Plusieurs Exquises Receptes*, Paris, 1556. Pyonad.

An *Ordonnance* of Philippe-le-Bel,—"*touchant les Epiceries et les Denrées, qui se vendent au poids*," issued in the year 1312, contains the following paragraph designed to protect the purchaser of preserved ginger and pignolat:— *Ordonnance* of Philippe-le-Bel.

[1] *Polytique de l'Abbé Irminon*, ii. 336.

[2] [Note on the Trade of Montpellier, from Depping (G.B.) *Hist. de Commerce entre le Levant et l'Europe*, Paris, 1830, tome i., 304. "Encore une note de la maison du roi d'Angleterre, Henri III., à Bordeaux, qui en 1232 commanda à Montpellier, non seulement vingt pièces d'étoffes de soie, et quatre de drap écarlate, mais encore, trois *gourdes* de *Gingembre confit*." The *ipsissima verba* are "tres curdas de gyngibraco." *Rôles Français de la Tour de Londres*, extraits par Bréquigny.

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Ordonnance of Philippe-le Bel.

Item. Que nuls ne vende, ne achate pour revendre, *Gingembrat* ne *Pignolat* embouchié, et qu'il ne soit autel desous, comme dessus, et sans enchapleures [qui ne soint de même le cucre, et la confiture sans yringes. Et que nul nele reface en maniere que il melle viel avecques le nouvel, et que il ne le die a l'acheteur. Et que nuls ne face a confiture *nulle converture* de cucre, qu'elle ne soit dautel dessous comme dessus. Et cil qui sera trouvé faisant contre ceste Ordonance perdra toute *la confiture*, et *sera en l'amende.* Et ladite confiture par le commandement de la justice du lieu sera jugiée par le mestre du mestier du lieu, se mestre y avait, et se mestre n'i avoit, par cette mesme justice, et les dites gens et l'execution sera fait sur ce comme fait le requerra par ladicte Justice.]

23. Two boxes of the same, placed to the account of the executors.

24. *Nux muscata*, nutmegs; the quantity is half a pound.

Zedoary.

25. *Zedewand*, zedoary, the dried rhizome of one or more Indian species of *Curcuma*. During the middle ages, it was used as a spice of the same class as ginger. Its importance is indicated by its being mentioned in several tariffs as an article of commerce. Thus Jacque de Vitri, who was bishop of Acre, in Palestine early in the thirteenth century, names it as *Zedoaria*, vulgo *Citouart*, and says that it is imported into the Holy Land from India.

Droit de Rivage.

In the list of *Droits de Rivage* levied by the Podestat and Council of Marseilles, A.D. 1228, occurs the following:—"Grand cabas de Poivre, ou de Gingembre, ou de *Citoual*, ou de Laques, ou d'autres marchandises de même valeur que celles, la paie iv. deniers j. obole."[1] A charter of Henry, King of Navarre, regulating the rights of that sovereign in respect to the town of Provins, A.D. 1273, contains the following regulation :—

"Item paiera de chascune charge de Greinue, de Cire, de Pivre, de Bresil, de Gingembre, de Guenelle [*canelle*], de Citonal [citoual], et de Géroffle II. s., et de chascune charge d'Alun, d'Anis, d'Amendies, de Connin [comin], chascuns qui vendra," etc.

[1] Méry et Guindon, *Histoire des Actes . . . . . de la Municipalité de Marseille*, 1841, i. 372; Bourquelot, *Histoire de Provins*, 1839-40, i. 425.

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There is a similar enactment in which "*Cytoal*" is mentioned, in a tariff of the merchandise sold in Paris at the close of the thirteenth century.[1] In the list contained in the *Liber Albus* of the city of London, before referred to, the spice in question appears as *Cetewale*,[2] under which name it is mentioned by the poet Chaucer, and by many writers on drugs.

26. *Lichini*, wicks for candles or lamps.

28. *Paris Candles*.—Professor Thorold Rogers remarks that candles, called either *White Candles* or *Candles of Paris*, not unfrequently mentioned in mediæval domestic accounts, were imported into England.[3] Paris candles.

29. *Vas pro Candelis Parisiæ*, with appendages, would appear to be some special kind of candlestick used for a Paris candle.

27. "*iiij. Stateris*, and No, 30 "*j. Statera de Ferro*." The second of these entries seems to me to relate to steelyard.

[1] *Revue Archéologique*, ix. (1852), 213.

[2] ["There was ike wexing many a spice
As clowe, gilofre, and licorice,
Gingiber, and grein de Paris
Canell at *cetewale* of pris,
And many a spice delitable
To eten whan men rise fro table."
CHAUCER, p. 224, col. 2.] *Cetewale.*

[3] [The Chandeliers formed in Paris a separate guild from the Ciriers. The first made tallow candles, the second, only wax candles. In the *Boke of Curtasye*, date circa A.D. 1460, we read— The Guild of the Chandeliers.

"In chambur no lyght ther shalle be brent
Bot of wax, therto yf ye take tent;
In hall at soper schalle candels brenne
Of Parys, therin that alle men kenne."

From which it might be inferred that Paris candles were inferior to wax candles. The following is quoted from the *Wardrobe Accounts of Edward IV.*, anno 1480, edited by Sir Harris Nicholas :—"William Whyte, tallough chaundeller, for iij dosen and ix. lb. of p'is candell' for to light when the king's highness and goode grace on a nyght come unto his said grete wardrobe, and at other divers tymes."

La Bible Guiot de Provins is a violent satire on the thirteenth century. In it complaint is made of the excessive dearness of spices and electuaries.

"S'ils reviennent de Montpellier
Lor lectuaries sont moult chier;
Lors dient ils, ce m'est avis
Quil's ont gigimbraiz et pliris,
Et diadragum et rosat
Et penidoin et violat."]

[Diadragant, penidium.]

APPENDIX.

I. Chronological List of Daniel Hanbury's Papers.

II. Review of Pharmacographia, by H. B. Brady, F.R.S.

III. Letter of L. A. Buchner, Munich, Editor of the *Neues Repertorium für Pharmacie.*

IV. Selections from the *Nekrolog* of Professor Flückiger; translated from the German by Katharine A. Hanbury.

CHRONOLOGICAL LIST OF DANIEL HANBURY'S PAPERS.

(*Verzeichniss von Daniel Hanbury's Arbeiten.*)

1	Turnsole, with Note to Pereira on Dutch Cake Litmus.	*Pharmaceutical Journal* { ix. (1850) 308.
2	Resin of Norway Spruce Fir (*Abies excelsa*).	*Ibid.*, ix. (1850) 400.
3	Oil of Thyme [commonly sold as Oil of Origanum.]	*Ibid.*, x. (1850) 6.
4	Calumba Wood (an article imported as) supposed to be the produce of a Menispermum.	*Ibid.*, x. (1851) 321.
5	True Oil of Origanum ...	*Ibid.*, x. (1851) 324.
6	Insect White-wax of China	*Ibid.*, xii. (1853) 476.
7	Wurrus, a dye produced by *Rottlera Tinctoria*.	*Ibid.*, xii. (1853) 589.
8	Use of Coffee-leaves in Sumatra.	*Ibid.*, xiii. (1853) 207.
9	Scammony, Notes upon some Specimens of.	*Ibid.*, xiii. (1853) 268.
10	Febrifuge, Properties of the Olive (*Olea Europæa*, L.).	*Ibid.*, xiii. (1854) 353.
11	Storax Bark	*Ibid.*, xiv. (1854) 11.
12	Some Rare Kinds of Cardamom.	*Ibid.*, xiv. (1855) 352—416.
13	Tragacanth (note on) ...	*Ibid.*, xv. (1855) 20.
14	Wood-Oil, a Substitute for Copaiba.	*Ibid*, xv. (1856) 321.
15	A Green Dye from China	*Ibid.*, xvi. (1856) 213.
16	Penghawar Djambi, a new Styptic.	*Ibid.*, xvi. (1856) 278.
17	Notice of a Specimen of Insect-wax from China.	*Journal of the Linnean Society. Zoology*, i. (1856) 103.
18	Storax	*Pharm. Journ.*, xvi. (1857) 417—461
19	Manufactures of Grasse and Cannes.	*Ibid.*, xvii. (1857) 161.
20	Recollections of a Day's Botanizing on the Col de Lautaret.	Manuscript, April 14, 1858.

21	*Rottlera Tinctoria*, Roxb., and its Medicinal Properties.	*Pharmaceutical Journal* xvii. (1858) 405.
22	A Drug called Royal Salep.	*Ibid.*, xvii. (1858) 499.
23	Two Insect-products from Persia.	*Journal of the Linnean Society. Zoology*, iii. (1859) 178.
24	Insect-products from Persia, *Larinus maculatus*, and *L. mellificus*.	*Pharm. Journ.* xviii. (1859) 402.
25	Otto of Rose	*Ibid.*, xviii. (1859) 504.
26	Jacob Bell. Biography.	*Ibid.*, i. (1859) 153.
27	Botanical and Pharmacological Inquiries and Desiderata, Sir William J. Hooker and Daniel Hanbury.	*Ibid.*, i. (1859) 217.
28	Malambo Bark	*Ibid.*, i (1859) 321.
29	Frangipani	*Notes and Queries*, Dec. 24, 1859.
30	*Sclerotium stipitatum*, *Pachyma Cocos*, *&c.*, in common with F. Currey.	*Transactions of the Linnean Society*, xxiii. (1860) 93. Part I. [Read May 3, 1860.]
31	Note on a manufactured product of Sea-weed called Japanese Isinglass.	*Pharm. Journ.* i. (1860) 508.
32	Chinese *Materia Medica*	*Ibid.*, ii. (1860–1861) 15, 109, 553.
33	Anacahuite Wood (note on) a reputed Remedy for Consumption.	*Ibid.*, ii. (1861) 407.
34	Use of Balsam of Peru (note on) in the Roman Catholic Church.	*Ibid.*, ii. (1861) 446.
35	Chemical and Pharmaceutical Products of the proposed International Exhibition of 1862.	*Ibid.*, Vol. ii. (1861) 484. *Journal of Society of Arts, January* 14, 1861.
36	Chinese *Materia Medica*...	*Ibid.*, iii. (1861–1862) 6, 204, 260, 315, 420.
37	Cortex Winteranus ...	*N. Repert. f. Pharm.* xi. (1862) 241.
38	Minor Notes on the *Materia Medica* of the International Exhibition.	*Pharm. Journ.* iv. (1862) 107.
39	Anacahuite Wood, Origin of.	*Ibid.*, iv. (1862) 271.
40	Storax, Additional Observations on.	*Ibid.*, iv. (1863) 436.
41	Ordeal Bean of Calabar (note on) *Physostigma Venenosum*. Balf.	*Ibid*, iv. (1863) 559.
42	The best Methods of applying the Calabar Bean in Ophthalmic Medicine.	*Ibid.*, v. (1863) 25.
43	New Species of Amomum Oliver and Hanbury.	*Journal of the Linnean Society*, vii. (1863) 109.
44	*Zanthoxylum alatum*, Roxb.	*Ibid.*, vii. (1864) 171.

45	Manufacture of Balsam of Peru with additional Note.	*Pharm. Journ.* v. (1863–1864) 241, 315.
46	*Cassia moschata*, Humb. B et. K.	*Ibid.*, v. (1864) 348.
47	NOTE ON *Cassia moschata*.	*Transactions of the Linnean Society*, xxiv. (1863) 161. Part II.
48	A Chemist's Holiday. Jottings in France.	*Pharm. Journ.* vi. (1864) 245.
49	Botanical Origin of Gamboge.	*Ibid.*, vi. (1864) 349.
50	Garcinia, species affording Gamboge in Siam.	*Transactions of the Linnean Society*, xxiv. (1864) 487. Part III.
51	Botanical Origin of Savanilla Rhatany.	*Pharm. Journ.* vi. (1865) 460.
52	Chinese Sal Ammoniac (Note on).	*Ibid.*, vi. (1865) 514.
53	Memoranda on some Formulæ in the British Pharmacopœia.	*Ibid.*, vii. (1865) 51.
54	Some Remarks on the Nomenclature of the Pharmacopœia.	*Ibid.*, vii. (1865) 96.
55	Pharmaceutical Herbaria	*Ibid.*, vii. (1866) 542.
56	Notes on Prescribing ...	*Ibid.*, viii. (1867) 551
57	Remarks on the Necessity for a further Cultivation of Medicinal Plants.	*Ibid.*, viii. (1867) 575.
58	The Cultivation of Jalap	*Ibid.*, viii. (1867) 651.
59	Burgundy Pitch	*Ibid.*, ix. (1867) 162.
60	Professor Guibourt. Obituary.	*Ibid.*, ix. (1867) 205.
61	Opening Address. British Pharmaceutical Conference, Norwich.	*Ibid.*, x. (1868) 132.
62	Opening Address. British Pharmaceutical Conference, Exeter.	*Ibid.*, xi. (1869) 110.
63	Note on Chloral	*Ibid.*, xi. (1869) 198.
64	Rare Essential Oils ...	*Ibid.*, xi. (1869) 209.
65	Historical Notes on Manna	*Ibid.*, xi. (1869) 326.
66	The Price of Medicines	*Chemist's* and *Druggist's Almanac.* (1870).
67	The Adulteration of Saffron.	*Pharm. Journ.*, i. (1870) 241.
68	A species of Ipomœa affording Tampico Jalap. [*Ipomœa simulans.*]	*Journal of the Linnean Society*, xi. (1870) 279.
69	Inquiries relating to Pharmacology and Economic Botany. Oliver and Hanbury.	*Pharm. Journal* ii. (1871) 204, 243.
70	Historical Notes of the Radix Galangæ of Pharmacy.	*Journal of the Linnean Society*, xiii. (1871) 20. *Pharm. Journ.*, ii. (1871) 248.

71	*Amomum angustifolium*, Sonnerat.	*Journal of the Linnean Society*, xiii. (1872) 154.
72	The Madagascar Cardamom or Longouze.	*Pharm. Journ.* ii. (1872) 642.
73	Calabrian Manna	*Ibid.*, iii. (1872) 421.
74	African Ammoniacum ...	*Ibid.*, iii. (1873) 741.
75	Botanical Origin and Country of Myrrh ...	*Ibid.*, iii. (1873) 821. *Ocean Highways*, April 1873.
76	Pareira Brava	*Pharm. Journ.*, iv. (1873) 81, 102.
77	A Peculiar Camphor from China. [Ngai Camphor]	*Ibid.*, iv. (1874) 709.
78	Chondodendron or Chondrodendron.	*Ibid.*, v. (1874) 421.
79	Cinchona or Chinchona ...	*Ibid.*, v. (1875) 646. *Athenæum*, January 30, 1875.
80	Review of Markham's Memoir of the Countess of Chinchon.	*Academy*, April 3, 1875.
81	The Spices, Groceries and Wax of a Mediæval Household, A.D. 1303-10 (Posthumous Paper).	*Pharm. Journ.* vi. (1875) 443.
82	The *Pharmacographia* ...	Flückiger and Hanbury, October, 1874.

REVIEW OF FLÜCKIGER AND HANBURY'S "PHARMACOGRAPHIA."

Pharmacographia : a History of the Principal Drugs of Vegetable Origin met with in Great Britain and British India. By Friedrich A. Flückiger, Ph. D., Professor in the University of Strasburg ; and Daniel Hanbury, F.R.S., Fellow of the Linnean and Chemical Societies of London. (Macmillan and Co., 1874.)

By H. B. Brady, F.R.S.

1874.

"Nature," Nov. 19, 1874.

There was a stir of anticipation and inquiry amongst pharmacologists when it first became known that Prof. Flückiger and Mr. Hanbury were engaged upon a work of joint authorship. Speculation was busy as to what was to be the nature of the book, to what particular objects it would be directed, what extent of ground it would cover and so forth. Upon a single point all were agreed, namely, that it would *not* be one of those composite treatises on drugs—organic and inorganic—therapeutics, pharmacy, and toxicology, enlivened by traditional botany and old-fashioned chemistry, which have passed current amongst us as "Manuals of Materia Medica."

One generation after another of compilers has produced volumes supposed to be suited to the wants of the time, in which the same sort of information has been given, the same errors perpetuated often in almost identical words, until the very term "Materia Medica" has come to be looked upon with suspicion by scientific men. Perhaps the origin of the shortcomings of the general run of such works may be traced to the fact that they have often been written by practising physicians who were lecturers in medical schools, and have been designed primarily as handbooks for medical students. Nor need it be a matter of wonder that, with no special facilities for acquiring original information as to the history of drugs, and with few opportunities for verifying the statements of others, authors so situated were content to transcribe without

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examination what had been already recorded as fact, and to devote their better energies to the more purely medical relations of the subject—the aspect of chief interest both to themselves and those for whom they wrote.

The question has often been raised, and once at least on very high authority, why the overcharged curriculum of medical study should still be encumbered with Materia Medica; why, in view of the separation which is gradually taking place between the practice of medicine and that of pharmacy and of the scientific education now received by the pharmacist, such matters as the physical characters, sources, and chemistry of drugs should not be referred to those whom they primarily affect.

This, perhaps, is scarcely the place to discuss such questions in detail, but they inevitably present themselves on a comparison of the present book with any of those to which allusion has just been made.

It is generally no very difficult thing to give an intelligible account of a work embodying the results of scientific research. It is not requisite that the knowledge of the reviewer should be co-extensive with that of the author to enable him to form a just estimate of its strong and weak points, or even to exercise the critical faculty where opinions rather than facts are advanced. But the task of introducing suitably a closely-printed volume of 700 pages, containing scarcely anything but facts—an unusual proportion of which are stated for the first time, and those which are old assuming a new importance from their fresh verification, the whole given with a condensation of style that refuses page-room to a superfluous word—is not one that can be performed by the ordinary method of summarising results.

The scope of the "Pharmacographia" and the intention of its authors can hardly be better told than by a few extracts from the preface. After defining the word pharmacographia as "a writing about drugs," the authors state that "it was their desire not only to write upon the general subject and to utilise the thoughts of others, but that the book which they had decided to produce together should contain observations that no one else has written down. It is in fact a record of personal

researches on the principal drugs derived from the vegetable kingdom, together with such results of an important character as have been obtained by the numerous workers on Materia Medica in Europe and America." 1874. H. B. Brady.

Restricting the field of their inquiry by the exclusion of pharmacy and therapeutics, "the authors have been enabled to discuss with fuller detail many points of interest which are embraced in the special studies of the pharmacist."

"The drugs included in the work are chiefly those which are commonly kept in store by pharmacists, or are known in the drug and spice market of London. The work likewise contains a comparatively small number which belong to the Pharmacopœia of India: the appearance of this volume seemed to present a favourable opportunity for giving some more copious notice of the latter than has hitherto been attempted."

Now as to the manner of treatment. A uniform subdivision into sections has been adopted throughout the work. In the first place, "Each drug is headed by the Latin name, followed by such few synonyms as may suffice for perfect identification, together in most cases with the English, French, and German designation.

"In the next section, the *botanical origin* of the substance is discussed, and the area of its growth or locality of its production is stated."

"Under the head of *history*, the authors have endeavoured to trace the introduction of each substance into medicine, and to bring forward other points in connection therewith, which have not hitherto been much noticed in any previous work."

"In some instances the *formation, secretion*, or *method of collection* of a drug has been next detailed: in others, the section *history* has been immediately followed by the *description*, succeeded by one in which the more salient features of *microscopic structure* have been set forth."

The next division includes the important subject of *chemical composition;* then follows a section devoted to *production and commerce;* and lastly, observations, chiefly dictated by actual experience, on *adulteration* and on the *substitutes* which in the

1874. H. B. Brady.

case of certain drugs are occasionally found in commerce, though scarcely to be regarded in the light of adulterants.

"The medicinal uses of each particular drug are only slightly mentioned, it being felt that the science of therapeutics lies within the province of the physician, and may be wisely relinquished to his care."

The reader must not judge the preface by the disconnected sentences which have been quoted to serve a particular purpose. Only sufficient has been copied to explain briefly, and as far as possible in the author's own terms, the general scheme of their work.

The plan, as will be seen, is one of great comprehensiveness, and the execution throughout is of characteristic thoroughness. A single article taken at random from the book would be better evidence than any criticism, of the exhaustive character of the treatment; but unfortunately considerations of space preclude anything more than a few general remarks suggested by a first perusal.

The investigation of the botanical origin of drugs is one which Mr. Hanbury has made his own, and few writers have set at rest so many debated questions in this division of the subject. Completeness and accuracy of the information now collected is exactly what might have been expected. The student who knows only the British Pharmacopœia will find much to learn, and something to unlearn, concerning the origin of many common medicinal substances. In some cases the corrections necessary arise merely out of questions of priority in botanical nomenclature, but in others the errors are founded on the wrong identification of the plants. For instance, *Jateorhiza palmata*, Miers, is the name accepted, for reasons given in the text, for the plant yielding calumba root, rather than the alternative specific terms of the Pharmacopœias. Oil of cajuput is assigned to *Melaleuca leucadendron*, L., whilst in the British Pharmacopœia and the Paris Codex it is referred to *M. minor*, D.C., and in that of the United States to *M. cajuputi*, Roxb. Sumbul root, the botanical history of which in our Pharmacopœia is stated to be unknown, appears as the product of

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Euryangium Sumbul, Kauffman, a plant of the natural order Umbelliferæ. On the other hand, in speaking of the botanical origin of myrrh, which the Pharmacopœia, without show of doubt, assigns to *Balsamodendron myrrha*, Ehrenb., it is stated that "the botany of the myrrh trees is still encompassed with uncertainty, which will not be removed until the very localities in which the drug is collected shall have been well explored by a competent observer." It would be easy to multiply examples, but beyond a passing allusion to Pareira Brava as the root of *Chondodendron tomentosum*, Ruiz et Pav., a fact determined by Mr. Hanbury's researches, this portion of the subject need not be dwelt upon.

The information given under the head of "history" has a general as well as a technical value. All sorts of writers, ancient and modern, have been laid under tribute; and the glimpses one obtains, not only of the medical but of the domestic employment of drugs in past times, are full of interest.

This running commentary need not be extended to all the headings under which the treatment of each substance is arranged. The term "substitute" as distinct from "adulteration," perhaps needs a word of explanation. It is employed to comprise substances occasionally met with in commerce, the product of plants more or less closely allied to the official one; for instance, the wood of *Quassia amara* instead of that of *Picræna excelsa*, the occurrence of the root of *Aristolochia reticulata* in place of *A. serpentaria*, or of the dried plant of *Piper aduncum* in lieu of the true Matico.

The notices of Indian official drugs have the interest of novelty to European students, but beyond this leave little room for present remark. In course of time some of them may be introduced at home, and in any case, with the amount of communication which exists between England and her Eastern possessions, nothing which concerns the one can be unimportant to the other. Indian medical men are largely drawn from this country, and by them, at least, they will be gratefully received.

The only department of the book which does not yield unalloyed satisfaction is that which refers to "microscopical

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Structure." The descriptive paragraphs are no doubt as good as words can make them, but mere words are insufficient for the purpose. If any one doubts this, let him try to construct a drawing of microscopic structure from a description, and then compare it with the reality; or, on the other hand, let him endeavour to identify one vegetable production out of a number closely allied, by means of a mere verbal definition of characters. Either task is difficult at best, sometimes impossible. It is not to our credit that there should be no British work of reference containing a complete series of illustrations of the anatomy of drugs. What is wanted is not so much an elaborate atlas, like that of Dr. Berg, with large, ideal, diagrammatic drawings, suggested by the microscopic appearance of the various vegetable products used in medicine, as a set of figures of characteristic portions of structure presented in a form in which the working student may recognise them. How welcome such an addition to the book would have been from Prof. Flückiger's skilful hand! It is only just to the authors to state that they make no claim for completeness in this division of the work; indeed, they are so fully aware of what is needed, that one might almost indulge in the hope of seeing a second edition with a supplementary volume of plates.

In a brief and imperfect notice like the present but scanty justice can be done to a book like the *Pharmacographia*, a work which, from the amount of its original matter, the laborious verification of its facts, the accuracy of its references, and the extent of general erudition it reveals, will be received with no grudging welcome, and will be recognised at once and without misgiving as the standard of authority on the subjects of which it treats.

LETTER FROM THE EDITOR OF THE *NEUES REPERTORIUM FÜR PHARMACIE.*

"MUNICH, 3*rd January*, 1875.

"MY DEAR SIR,

"I desire now at the beginning of the new year, not only to express to you my best wishes for your future well-being, but also to thank you most warmly for your last very valuable literary present. Your *Pharmacographia*, compiled in union with Professor Flückiger, which the latter had the kindness to forward to me in your and his name, is an excellent work, one only possible to be produced by the association of two authorities in this branch, an English and a German savant. I hope shortly to be able to notice this work in my journal, in order to aid in spreading the knowledge of the same in Germany; in England and America it will, without this, have a widespread circulation. All your later and very interesting papers, which have been sent to me, I have translated with great pleasure into German, and have inserted them in my new *Repertorium for Pharmacy*. Your communication about the origin and native country of myrrh reminds me of what my late colleague Dr. Roth in the year 1844 communicated on this subject from his own observations (Buchner's *Repertorium*, second series, xxxv. 19). Roth, who was for almost three years member of an English expedition in Bombay, Calcutta and especially in Abyssinia, found two kinds of myrrh trees on the way by the sea-coast from the Gulf of Aden to the foot of the Shoa Mountains, where by reason of the unbearable heat and want of water few plants grow. On account of the fearful heat in those low-lying districts they call the neighbourhood 'Tehama' which means hell. The ground is basaltic, mostly bare. The myrrh-tree grows only as a shrub. The passing camel-drivers generally injure it in this way. They tear out the branches and stronger twigs at their axil, or bruise the bark, by which means the sweetly-smelling Milk-sap flows out. On their return journey the camel-drivers often find the myrrh hardened into considerable lumps.

1875.

L. A. Buchner.

1875. To your learned paper on Pareira Brava I allow myself to add the remark, that in the year 1864 Winckeler, in my *New Repertorium for Pharmacy*, xiii. 49, 200, described a root, which had appeared in Frankfort commerce, in which root he found a considerable quantity of cissampolin or pelosin and also the same alkaloid which is contained in the trunk of Pareira Brava. By my inducement Dr. Eichler, then assistant with Martius, now Professor of Botany at Kiel, histologically examined this root, and he convinced himself that it has exactly the same form as the Menispermaceæ, that it is in every respect extremely like the thinner pieces of the Radix Pareiræ Bravæ of trade, if not identical with it and in any case is derived from one of the Cissampelos kind.

"Accept my best thanks and the assurance of my highest esteem.

"Yours very obediently,

"L. A. Buchner."

Obituary Notice

OF

DANIEL HANBURY,

BY

PROFESSOR F. A. FLÜCKIGER,

OF STRASBURG.

Translated from the German

BY

KATHARINE A. HANBURY.

OBITUARY NOTICE.

(*Flückiger.*)

1875.

In the focus of the trade of the world, in the city of London, is situated in Lombard-street a very peculiar pharmaceutical business, of which the name, "Plough Court" points to times when the plough still traced its furrows, where now roars the mighty surge of the commerce of the globe.

Plough Court and William Allen.

Many associations are attached to Plough Court; for instance, as the eighteenth century drew to a close, an original man. William Allen began to develop there his manifold, practical, philanthropic and scientific activity. His work, accomplished in conjunction with W. H. Pepys, on carbonic acid, mercury and platinum, and his co-operation in Sir Humphrey Davy's electrical researches have found a place in text-books.

In the outskirts of the giant city, from time immemorial, very extensive spaces have been preserved in all the charm of natural luxuriance. These "commons" surrounded by very pleasant, simpler, or more pretentious country-houses, are indeed *common* property not only to the inhabitants, but to all who here seek recreation under shady elms, among unchecked brushwood, or on green turf. Only the nearer or more distant scream of the locomotive interrupts the contemplative scene; railroads themselves, or other regardless intruders, are restrained by the power of the law from attacks on the common.

Clapham Common.

Clapham Common is one of these natural gardens in the south-west of London, and Daniel Hanbury divided the larger proportion of the days of his life between Plough Court and the pretty country-house, with its view across the still life of Clapham Common; as also did his worthy father, Daniel Bell Hanbury, who now survives his son, who was born on the 11th of September 1825.

Between the two poles of practical and scientific attention to pharmacy, and happy in the enjoyment of the investigation of

1875. nature, the outward and inner life of the deceased passed, and was completed in undisturbed harmony.

School life. He was placed, but only till his sixteenth year, in a private school in the neighbourhood, at Croydon. The school was by no means a distinguished one, but nevertheless the foundation was laid by this means for a wider culture, to the further finishing and deepening of which Mr. Hanbury set himself with unflinching diligence. Large classical and historical acquirements were combined with great skill in drawing in pencil and in water-colours, which he afterwards practised from nature.

In 1841 he began to be actively engaged in practical pharmacy at Plough Court; the firm, Allen, Hanbury and Barry still bore the name of William Allen (who died in 1843) besides that of D. Bell Hanbury. Daniel Hanbury was distinguished by such a strikingly developed genius for exactitude and order in their widest sense, that it was not difficult for him to gain a taste for practical pharmacy; and his performances in the dispensary, as also in the laboratory and in the mercantile department soon found full acknowledgment.

He carried on his technical studies with the same conscientious zeal (especially in a botanical direction) at the institution which had been founded in Bloomsbury Square by the Pharmaceutical Society. Here he soon drew upon himself the attention of Jonathan Pereira, the most thorough and learned pharmacologist of his time, who, till his death (January 20, 1853) had the strongest affection for his pupil, and exerted an important influence on his scientific course.

Friendship with Pereira.

In 1850 Mr. Hanbury began the series of papers of which from time to time more than sixty have appeared in the *Pharmaceutical Journal*, some also in the publications of the Linnean Society, and a few in the *Athenæum* and elsewhere.

If a hero of chivalry be described, it is said significantly, "A man every inch of him." It is similarly appropriate to say of our friend: "Truth, every inch of him." This characteristic, which found expression in his whole being, confronts us with great distinctness even in Daniel Hanbury's first work. In the paper on the oil of *Thymus vulgaris* he already noted down

original observations collected in 1849 during a journey to the South of France, and turned them to account in correcting errors which prevailed with regard to the oil in the London market. 1875.

Frequently repeated excursions into the same districts brought Mr. Hanbury into connection with French fellow-students; for example with the celebrated pharmacologist Guibourt, to whom Mr. Hanbury dedicated in 1867 a well-deserved tribute of respect. But also in Provence, at Nîmes, Montpellier, and at Antibes, it was doubly easy to Mr. Hanbury, with his good knowledge of the French language, to make friends with botanists of merit, and also to see and to learn much, among workmen and intelligent landed proprietors, which was of value for his special purpose. French associations.

His love for truth led him of necessity to form numerous connections in his researches. In countless instances second-hand knowledge could not stand its ground before his critical acumen, and had to give way before his own superior observations. Only the most trustworthy reports, samples and specimens collected with the greatest care by a skilful hand, satisfied him. The best book-knowledge, offered for sale in the market did not content him, but he referred back to the sources of information, testing them minutely.

On such foundations were all the papers placed which from time to time came in finished language from Mr. Hanbury's pen, and these were never suggested by any other aim than the purest, most unselfish love of investigation. They are the short and compressed results, very deliberately matured, of labours often demanding very much time. The comprehensive material for the work was finally limited by Mr. Hanbury to the matter which was indispensable for supporting his conclusions in the eyes of the reader; and therefore much unnecessary framework was left out. Thus his intellectual efforts displayed those excellent qualities which he had already developed in practical matters. Method of research.

The recognition for which he strove in no other way than by the performance of work, was not wanting, and in the same

1875. degree his scientific connections were widened, and the resources at his disposal increased. These gradually extended (quite independently of the already valuable business connections of Plough Court) to all countries and many institutes, from which gain to pharmacology was to be expected. Parcels were sent and reports received, as from St. Petersburg, so from Campinas in the province of San Paulo; explanations poured in from Pekin and New York, from the Amazon, the Red Sea, Singapore or Hindostan, and were examined, valued, and replied to.

Abundant and varied help.

Mr. Hanbury's reputation in his own country was attested by the confidence vouchsafed to him by the Pharmaceutical Society and the British Pharmaceutical Conference. In 1868-69 he presided over the latter; he was a member of the former and for twelve years examiner.

F.L.S. F.C.S. F.R.S.

In 1855 he was gratified by being elected a fellow of the Linnean Society (to which he later acted as treasurer); by being made a fellow of the Chemical Society in 1858, and by his relations with the London Institution, and his subsequent admission into the Royal Society in 1869 — a very rare distinction in pharmaceutical circles.

In these great bodies he found abundant opportunity for extending his knowledge both in special branches and generally.

Mr. Hanbury could also make useful to his objects, in the most effectual manner the London Exhibition of 1862 and the Paris one of 1867, as he was appointed adjudicator of prizes to both.

Admiralty work.

He performed service of a similar nature in 1859 and 1871 to the *Admiralty Manual of Scientific Inquiry* when, on the first occasion in conjunction with Sir William Hooker, on the second with Mr. Oliver, Professor of Botany, he turned his well arranged knowledge to account in pointing out gaps in scientific knowledge, the filling up of which the Admiralty wished to urge. In more than one case he was permitted to live to see the answers and missives from distant lands, relative to these subjects, and to take part also in working at the tasks he had set.

The Continent also paid its tribute of esteem to Mr. Hanbury; in Germany this was through the "Leopoldinisch-Carolinische

Academie" and through the University of Munich, which latter appointed Mr. Hanbury honorary M.D. at its Jubilee Festival, Aug. 2, 1872. His modesty never allowed him to make use of this title. 1875.

Travel and travellers.

Owing to the direction which Mr. Hanbury's principal study took, more and more, travelling seemed of necessity an especial assistance, both the reading of books of travel and personal intercourse with travellers. Among these, Richard Spruce was a great friend of the deceased; this explorer of the Amazon and Rio Negro, so highly accomplished both as a botanist and as a linguist, was very much esteemed by Mr. Hanbury, and gave him manifold assistance in his work.[1] A whole circle of fellow-countrymen and foreigners, who had lived in India or China, gave Mr. Hanbury valuable aid in the working out of individual questions, as, for example the gifted editor of Marco Polo, Colonel Yule—Dr. Bidie, Dr. Brandis, Dr. Bretschneider, of Pekin, Mr. Broughton, Dr. Cleghorn, Mr. MacIvor, the missionaries, Dr. Lockhart and Mr. Wylie; Moordeen Sheriff, Dr. Waring and many others. From men so well informed Mr. Hanbury knew how to obtain for himself the most reliable information, both in conversation and by correspondence.

Journey to the Holy Land.

He himself travelled in 1860 to Palestine and Smyrna with Dr. J. D. Hooker, Director of the Kew Gardens, his especial friend. Gain to pharmacology from these parts appears here and there in his writings.[2]

For some years before his death he loved, sometimes twice in the year, to pass a few weeks at Mortola, near Mentone, on the estate of a brother, and this generally advanced his scientific objects.

Personal investigations.

In May, 1872, he collected information on the spot, in Tuscany, Calabria and Sicily, concerning orris, liquorice, manna, oil of bergamot, &c., in order to settle certain questions of which the solution is now to be found in the *Pharmacographia*. Other similar journeys were already planned, when he was attacked by his mortal illness.

Mr. Hanbury became more and more absorbed in the study of

[1] Comp. *Pharmacographia*, 642.
[2] *Pharmacographia*, 146, 153.

1875.

Three famous workers, Clusius, Pereira, Guibourt.

the Materia Medica of the vegetable kingdom, and more and more matter constantly poured in to him. Though so much intellect and labour (comparatively more in earlier times than now) have been expended on this department, still the verdict is well-founded, that no inquirer has ever worked upon such a comprehensive, certain foundation as Daniel Hanbury. None was fitted for it in the same degree, by a course of self-denying education, by inclination, and by favourable outward circumstances. Clusius might perhaps be compared to him, if it were allowable to apply the same standard to performances in natural science, separated by two centuries and a half. Pereira, the master so highly esteemed by Hanbury himself, grasped, as a physician, a much wider theme, whilst Hanbury, working partly at the same subjects, though from a pharmaceutical point of view, knew how to develop this one side more effectually and with more penetration, adducing the most perfectly reliable information. Guibourt, held by the French the first authority of his time, with as undisputed right as Pereira on the other side of the Channel, differs essentially from the two Englishmen. He was a very acute observer, who had come, like Hanbury, out of the school of a rich practical experience, and in addition was expert in the office of instructor, like Pereira. But Pereira's and Hanbury's circle of vision was by so much the more extensive as English influence exceeds French in the world. Guibourt possessed less the power of understanding foreign circumstances, less of that wealth of geographical, historical, and linguistic knowledge, and of mercantile skilfulness which were peculiar to Hanbury, and enabled him in so many cases, overleaping normal bounds, to look back to the most remote sources. This significant peculiarity of the latter is reflected in his works ; many of these offer results of enduring value, which will not easily fall into oblivion through the ceaseless advance of the stream of progress.

To such belong his papers of 1852 upon frankincense,[1] those of 1854 on scammony,[2] the beautiful work upon cardamoms,[3] 1855, — the last was a permanent pet subject, which Mr.

[1] Epitome in Wigger's *Yearly Report on Pharmacy*, 1852, 82, also 1864, 104. [2] *Ib.* 1854, 31, and 187. [3] *Ib.* 1855, 11 to 14.

Hanbury brought before the public even then with the fullest command of matter, but which he also always very gladly took up again later as occasion offered; in the same way as he also generally cultivated Zingiberaceæ in his hot-house with quite a special affection, examining them while getting together further matter. 1875.

Mr. Hanbury's paper on storax[1] (1857) is a brilliant example of his work. In this he treats the history of the balsam exhaustively, giving a clear statement of its confused traditions, and also (for example) proving the inaccuracy of Landerer's more recent statements on the same subject. Furthermore Mr. Hanbury verified the preparation of the drug from the incontrovertible reports of eye-witnesses, and annexed a sketch of *Liquidambar Orientale*, Mill, which tree yields the storax of to-day. Mr. Hanbury supported his demonstrations on his knowledge of the classical literature bearing upon the subject, but the work shows also that he did not shun the labour of making himself so far acquainted with the Turkish language as was desirable for the end sought. Some knowledge which he had also gained of Arabic was of use in working out the *Pharmacographia*. Storax.

Abilities such as these were soon again turned to account in the important research on otto of rose of 1859. Here also, the point was to replace errors by indubitable certainty. Mr. Hanbury showed how and where the otto of rose of modern commerce is obtained, and discussed some of its physical properties. A German observer, Dr. R. Baur, of Constantinople, had the opportunity, in 1867, of seeing the manufacture of otto of rose on the spot, and aided Mr. Hanbury's researches without being aware of them. Mr. Hanbury, on the other hand, gave Dr. Baur's work to his countrymen, in a translation, and added some remarks thereto. Otto of Rose.

In 1860 and 1861 Mr. Hanbury was much occupied with the Materia Medica of the Chinese, for which end he also made himself somewhat acquainted with their language. These studies could only be undertaken by a pharmacist who was aided by

[1] *Ib.* 1857, 11.

1875.

Chinese Materia Medica.

extensive acquaintance with the literature of Eastern Asia having reference to the subject, and with the Chinese flora. Both are observable in a high degree in Mr. Hanbury's *Chinese Materia Medica*, although the neatly-bound separate impression which appeared in 1862 only contains 48 octavo pages.

Dr. Theodore Martius (died 15th September, 1863), the most distinguished German student, at that time, in the same branch of science, and a personal friend of the author's, gave a translation of the work, though without the illustrations of the original (*Contributions to Chinese Materia Medica*, Speier, 1863). Regard should be had to these researches whenever there is a question of Chinese Materia Medica.

Cortex Winteranus.

The drug brought by Captain Winter from the Straits of Magellan, and described as "Winter's bark" by Clusius in 1605, became confounded by degrees in a remarkable way with other barks. On this subject again Mr. Hanbury threw light with a sure hand, in 1862 in a paper[1] which will remain historically valuable even when Winter's bark has fallen still more into oblivion than now.

Balsam of Peru.

Pereira occupied himself in 1850 in searching out the origin of balsam of Peru; it was reserved for Mr. Hanbury, who devoted his attention to this interesting subject in 1863 and 1864, to bring it to a conclusion, with the assistance of Dr. Dorat, a resident on the Central American balsam coast itself. Mr. Hanbury's papers on this subject, which have long since become the common property of the literature of this department of science, follow as working side-pieces to that upon storax. As on the occasion of writing the latter, he acquired some knowledge of the Turkish language, so, being occupied with the literature concerning balsam of Peru, he felt the same obligation laid upon him with regard to the Spanish tongue. His well furnished "study" contains in rank and file the Spanish authors since the conquest of Peru, in whose works information concerning the balsam and other drugs is to be found.

In 1864 the origin of gamboge was successfully established; in 1865 Savanilla rhatany was traced back to *Krameria*

[1] *Pharmacographia*, 17.

tomentosa, St. Hilaire (*Kr. Ixina, var. β. granatensis, Triana. Kr. grandifolia*, Berg.) The *Historical Remarks on Manna*, written in 1865, may be held up as a pattern of comprehensive reading, appropriate treatment and lucid statement. They were afterwards satisfactorily completed through their author's above-mentioned journey to Calabria and Sicily. 1875. Manna.

In the following year Mr. Hanbury's long continued researches on the subject of Tampico jalap were crowned with success. He found that it is the root of an Ipomœa (in which his practised eye recognised a new species[1]) growing in the interior of Mexico, in the Sierra Gorda, and at Oaxaca. Those who had the opportunity of seeing in his garden this *Ipomœa simulans*, HANBURY — besides the common jalap convolvulus, *Ipomœa purga* — could not mistake the difference between the two plants, in spite of their great similarity. Tampico Jalap.

For a thousand years Galangal root has been known as a spice and medicine, but again Mr. Hanbury's researches were needed to obtain, at last, certainty as to its origin, through the assistance of Dr. H. Fletcher Hance, of Whampoa (the roadstead of Canton). Galangal.

This botanist had, at Mr. Hanbury's instigation, in 1867, caused search to be made for the plant yielding this rhizome, on the Chinese island of Hainan, south-west of Canton, and soon received it through an American, Mr. Taintor, a custom-house officer in Chinese employ. Dr. Hance named it *Alpinia officinarum*; Mr. Hanbury adding to the description[2] remarks evidencing his usual care, and which trace back the history of the drug to the early middle ages.

Mr. Hanbury's researches concerning Pareira Brava,[3] in 1873, combined all the excellences of his diligence, and the result will always form a remarkable contribution to the history of Pharmacognosis, although that root, still valued in England, has long been forgotten with us. Pareira Brava.

[1] *Yearly Report of Pharm.* 1870, 81. Sketch of *Ipomœa simulans* in *Journ. of the Linn. Soc. Bot.*, xi. (1871), 272.
[2] *Yearly Rep. of Pharm.* (1871), 33.
[3] *Ib.* 1873, 125, with sketch.

1875. The last paper[1] of the deceased might be termed polemical, did it not, like everything which came from his pen, keep purely to the point.

On the other hand, it is not like him that he should turn his attention to Cinchona bark, a theme which Mr. Hanbury habitually avoided. In this case also he only touched it superficially; throwing his influence into the scale in favour of the word *Cinchona*, which Mr. Markham wished to see altered to *Chinchona*. But even in this apparently so very simple discussion Mr. Hanbury, going back, as he was wont, to the sources of knowledge, adduced new evidence in favour of the view he had taken.

Cinchona *versus* Chinchona.

Friendship with Flückiger.

The researches on individual points, whose quality is made apparent by the above remarks, were finally followed by a comprehensive volume in which Mr. Hanbury put his best work. His above-mentioned views on frankincense had been the occasion in 1864, of his acquaintance with Dr. Flückiger, which ripened into an intimate friendship after the first personal meeting in 1867. Being occupied henceforth conjointly with the same questions, the thought of making complete and systematizing results occurred to them. This project was comfirmed by the reflection that the English language could offer no work expressing the ideas of the two friends.

The task was begun, furthered in conversation and by letter, and every effort made to clear up the questions of a scientific and practical nature which arose in unanticipated abundance.

Otium cum labore.

Mr. Hanbury left the business at Plough Court in 1870, and then lived almost exclusively for this common object. The collections and libraries of London, Kew and Paris, the warehouses of the London docks, what the auctions of the drug brokers in the city offered for inspection, all these were repeatedly consulted or ransacked by the two friends together and compared by the aid of their mutual experiences and impressions. Scarcely any expedients were overlooked which could have been of much real use. Mr. Hanbury well knew his way about in London, through experience gained long ago, and now he employed all his acuteness

[1] *Pharm. Journal*, v. (1875, 13th. Feb.), 646.

in getting together the most reliable information on every subject, both from a practical and literary point of view, such indeed as was only obtainable among the inexhaustible resources of the metropolis of the world. 1875.

How far this often went, is shown in the case of Sir Robert Talbor,[1] whose will of 1681 had to be referred to (at the Will Office of the Archbishop of Canterbury at Doctors' Commons) in order to become better acquainted with this singular man, meritorious for having assisted in the introduction of Peruvian bark, but concerning whom the otherwise superabundant literature on Cinchona gives but scanty information. Will of Sir Robert Talbor. 1681.

Thus, in London and on the Continent, the authors searched and laboured, and at last in 1874 the work was completed.

The *Pharmacographia* appeared in October: the testimony of those competent to judge must decide whether the task was rightly undertaken and satisfactorily performed.

Only five months later, Daniel Hanbury concluded for ever, at Clapham Common, his unwearying labours. On the 6th of March 1875, he was quite suddenly seized with an ominous shivering; violent stomatitis, jaundice, and typhoid fever followed. His parents, brothers and sister tended the excellent son and brother (he had renounced wedded happiness), but on the 18th of March hope had already lessened and on the evening of the 24th the release came. *Mors janua vitæ.*

According to his wish he was interred quietly, in the burial-ground of the "Friends," situated not far off, at Wandsworth.

Like his teacher, Jonathan Pereira, Daniel Hanbury was called away in the midst of full activity, on the threshold of his fiftieth year.

The attentive observer reads the inner nature of this man in his works, in spite of their always purely objective character and concise form. If in them "every inch is truth" as far as it could be won by any endeavours, so Mr. Hanbury's whole appearance bore the impress of the purest truthfulness. Certainly no ignoble thought ever darkened his soul, and as his writings grasped the kernel of the matter, so in life he showed

[1] *Pharmacographia*, p. 307, Note 7.

1875. himself simple, confiding, without one ingredient of unnecessary or false display. Much of this may be attributed to his education at home, and in business, where the severe principles of the religious "Society of Friends" serve as the rule of conduct. But certainly these expressed his nature through and through, and satisfied him in the highest degree. Although belonging all his life to that estimable body, Mr. Hanbury was free from all ostentation in religious matters so that even intimate friends were scarcely aware of the deep earnestness of his convictions. All the charm of truth and purity dwelt in his refined, engaging appearance. His exterior, including the expressive firmness and neatness of his handwriting, corresponded harmoniously with the nobility of the soul. He made very high demands on himself in the fulfilment of his duty and in his work, and in this respect he was not lenient towards others, for in his judgment of their proper mode of conduct, he gave only the testimony of truth. He must indeed have been conscious of his own worth, and have seen how highly he was valued by those of his fellow-students in the same branch of science most competent to judge, but the satisfaction he experienced from this was blended with the modest consciousness of having served truth, to the best of his powers, for no selfish end.

Character and demeanour.

All who had the good fortune of being acquainted with Mr. Hanbury know that one of such an excellent disposition, while he gladly and thankfully received in the province of science, did not the less unselfishly impart, in few words, and in the most magnanimous manner.

Extreme punctuality.

It follows as a natural consequence that engagements of this kind were attended to by him with incomparable punctuality, although the number of his correspondents was by no means small, and the answers could not generally be written quite simply, without expenditure of time and trouble. His thus applying his superabundant matter explains his not having left behind important collections except his library. This contains the most valuable works that have ever appeared on pharmacy (in its widest sense), for with his extensive knowledge of languages Mr. Hanbury found comparatively few

limits in procuring the literature of all ages and countries, appertaining to his department of science. 1875.

Mr. Hanbury's was a genuine English nature, but in attaining his ends he often learnt to enter into foreign ideas, and this was not difficult to him. He was certainly more at home among persons of the nearest neighbouring nation, and in their elegant language, than in German science. But he gladly penetrated into German writings, not indeed with facility, but conquering, sometimes amid gay irony, "the endless periods of German profoundness." Carelessness in the orthography of proper names and of geographical and botanical appellations was most distasteful to him, and he acknowledged, commendingly, that this was not a German national vice. For the good side of German character he had an acute eye and just appreciation; his warm British patriotism, which he never renounced, did not for one moment prevent him from being perfectly just to German culture and to German scientific pharmacy. International acquirements.

So we on the Continent may justly mourn the much too early loss of this excellent man, to whom a place of honour is due in the history of our science.

F. A. Flückiger.

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