

## **On the manufacture of Balsam of Peru / by Daniel Hanbury.**

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Hanbury, Daniel, 1825-1875.  
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### **Publication/Creation**

[London] : [publisher not identified], [1864]

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*D. Seemann*

2297-1873

*from his friend the Auth*

ON BALSAM OF PERU.

T. Jackson

from his friend Mr. D. M.

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## ON THE MANUFACTURE OF BALSAM OF PERU.

C

BY DANIEL HANBURY, F.L.S.

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 republished 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 Pereirae*, which in 1857 was changed by Klotzsch of Berlin to *Myroxylon Pereirae*, he maintaining the distinctness of the two genera *Myrospermum* and *Myroxylon*.\*

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 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.

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.

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*.† That no possible mistake might exist on my

\* *Bonplandia*, 15 Sept. 1857, p. 274.

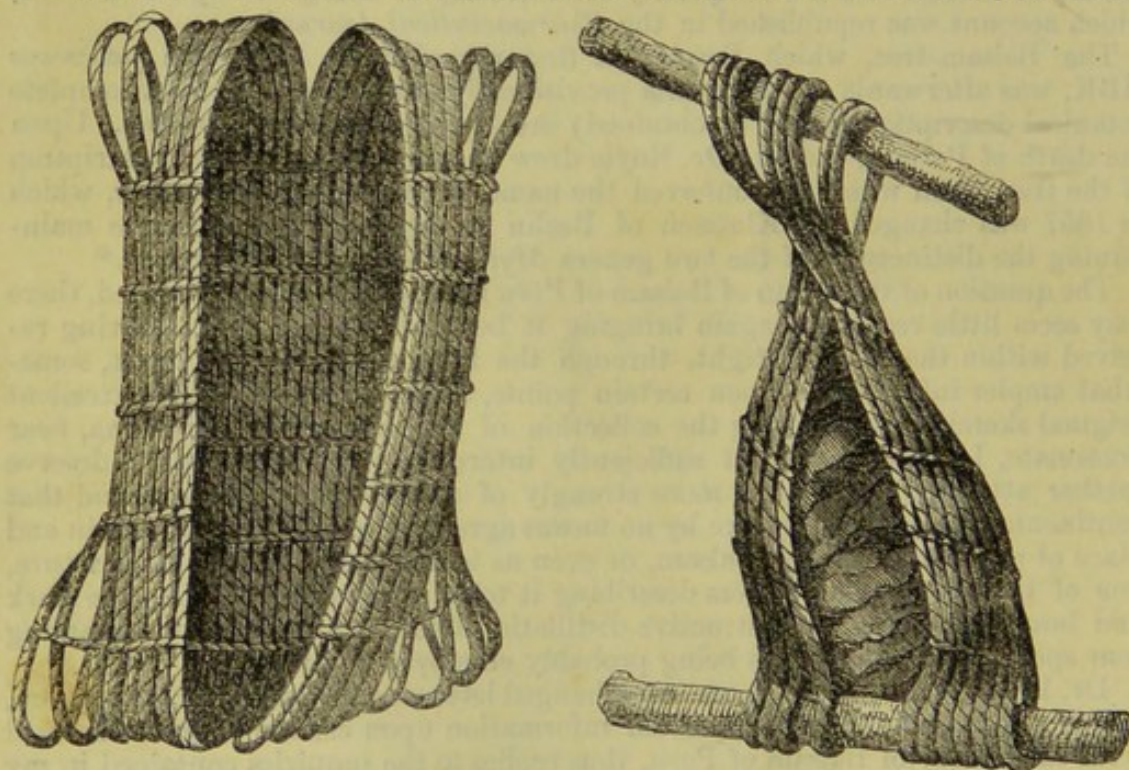
† Mr. Francis Walker, who has been good enough to examine this insect, considers it identical with the *Passalus interstitialis* of Percheron.



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.

Early in the months of November or December, or after the last rains, the balsam-trees are beaten on four sides of their 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 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

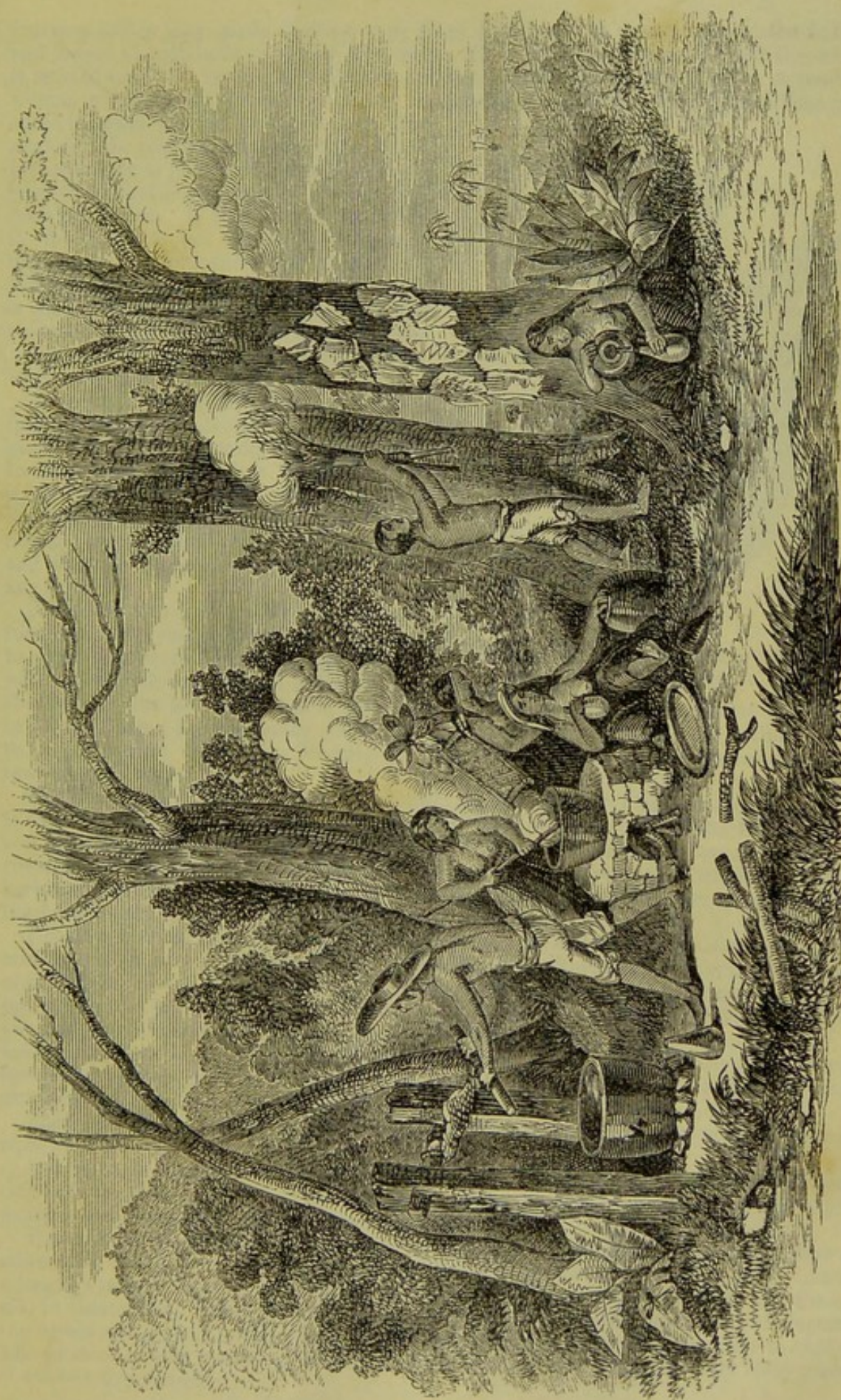


Rope Bag used for pressing the Rags.

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

\* This sketch represents:—1. The burning of the bark, after it has been loosened by beating 2. A tree to the stem of which rags have been applied in order to absorb the balsam as it exudes. 3. Boiling the saturated rags. 4. Pressing the rags after boiling. 5. Women waiting to fill the *tecomates* or gourds, and a woman so employed.





Indians collecting Balsam at Juisnagua near Sonsonate.







fourteen inches long, made of stout rope fixed together with 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 thus squeezed out. A washer-woman 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 5 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. 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.\* 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 *aguardiente*, far superior to any brandy.

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 collected. In the dog-days, that is from the 15 July to the 15 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.

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.

The small *pueblos* scattered over the so-called *Balsam Coast* are numerous. The principal ones are:—

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, (*Indian Mount of Wolves*), on an elevated ridge, the valleys on either side being well watered, is situated twelve leagues S.E. 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 sixty arobas of twenty-five pounds.



Gourds, or *Tecomates*—one covered with plantain leaves.

\* It is more probably made by simple expression, and not by boiling.—D. H.



Támanique, 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



Ancient Tributary Balsam Jar.

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, 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 forests surrounding this pretty pueblo, contain 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, at the foot of the Cerro del Tamagas, or Snake-hill, situated on a most extensive and fertile plain, six leagues from Sonsonate, S.E. 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 often sold in Sonsonate at four reals each. The Indians being in constant communication with Sonsonate are a vicious and lazy race. As in most of these pueblos, the wild animals commit great ravages among the cattle.

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, 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, etc.

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.—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.

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 enclose 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 reproduced 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.

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 it 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; 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 still preserved among the archives of Guatemala (of which state Salvador was formerly a part), as well as in the Vatican at Rome.\* Father Joseph de Acosta in his *Historia Natural y Moral de las Indias*, published at Seville in 1590, after referring to this fact, remarks that balsam is

\* Vide also *Pharm. Journ. and Trans.* vol. ii. (1861) p. 446.



brought from New Spain and the provinces of Guatemala and Chiapas and others in those parts where it most abounds, but that the balsam which is most prized, is that of Tolu.\*

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.†

In consulting other writers on Spanish America, I have also found incidental references to balsam, all tending to show that it was recognized as a production of Guatemala, and indeed of the very locality where it is collected at the present day. Thus Herrera, the dedication of whose work on the West Indies bears date 1601, writes:—

"On trouve en ceste province [*Guatemala*] plusieurs fontaines et sources d'eaux chaudes ayant diverses propriétés, vertus, et couleurs: il y a du baume, beau et beaucoup, que les Espagnols cognurent sans l'apprendre des Indiens, contre ce qu'un auteur en escrit. Plus il y a de l'ambre liquide, la gomme anime, copal et suchicopal, et autres sortes de gommes et liqueurs très-parfaits . . . . . Le havre Acaxutla pres de la Trinité [*Sonsonate*] à 13 degrés de hauteur, est le principal port de la province, pour aller en Neuf Espagne, et en Peru."‡

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 is as follows:—

\* "... 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 neuva 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.

† "... 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.

‡ *Description des Indes Occidentales*, traduit de l'Espagnol, Amst. 1622, cap. xii. I have also consulted the Spanish edition published at Madrid, 1601–15.

§ Lugd. Bat. 1633, fol. lib. vii. c. 11.



"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."

Alcedo, author of a Geographical Dictionary published at Madrid in 1786-9, writing of Sonsonate, observes that it includes in its jurisdiction the celebrated *Balsam Coast*, where is produced the richest balsam, which in all parts is held in particular estimation.\* 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.†

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.

The method of preparing the balsam resorted to at the present day was not the only one followed in old times, 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. This statement respecting the extraction of the balsam by boiling chips of the trunk and branches is given by most writers on *Materia Medica*, from Monardes in 1569 downwards.‡ Monardes indeed asserts that the balsam extracted in this manner is collected with shells from the surface of the water, a fact difficult to believe, as the balsam of modern times has a sp. gr. of 1·150 to 1·160. But perhaps this is capable of some explanation; for I have found that upon saturating some cotton cloth in Balsam of Peru and then boiling it in water, I was able with a spoon to 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 balsam, which is heavier than water, will mostly sink 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 enclosed in little calabashes,§ 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.

\* "Comprende 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-Histórico de las Indias Occidentales ó América*, tomo iv. (1788) p. 577.

† Having been unable to consult the original work, I have quoted Baily's translation, London, 1823.

‡ *De las Cosas que se traen de nuestras Indias Occidentales que sirven en Medicina*, part 1, cap. *Del Balsamo*.

§ De la Martinière, l. c.



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.

## NOTE ON THE GUM-RESIN OF THE BALSAM OF PERU TREE.

BY DR. ATTFIELD.

The naturally-exuded resin of the *Myroxylon Pereiræ*, as furnished to me by Mr. Hanbury, consists of

	In 100 parts.
Resin . . . . .	77.4
Gum . . . . .	17.1
Woody fibre . . . . .	1.5
Water and a small quantity of volatile oil, about . . .	4.0

The *resin* is an acid, its alcoholic solution feebly reddening litmus-paper, and is uncrystallizable. The *gum* is similar to that of gum arabic. The *volatile oil* is limpid, colourless, and fragrant.

Submitted to destructive distillation the exudation yields an acid water, empyreumatic oils gradually darkening in colour, and a pitchy residue which ultimately chars to a cinder. It contains no cinnamic acid.

This exudation is obviously therefore a *gum-resin* similar, for instance, to that of ammoniacum, and though found on the bark of the tree yielding the black fluid Balsam of Peru is apparently quite distinct from the latter substance, the one having no apparent relation to the other.

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