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CONTRIBUTION

TO A

(8)

NATURAL AND ECONOMICAL HISTORY

OF THE

COCO-NUT TREE.

BY

HENRY MARSHALL,

DEPUTY-INSPECTOR GENERAL OF ARMY HOSPITALS.

3
EDINBURGH :

PRINTED BY JOHN STARK.

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NO. 1

NATURAL AND ECONOMICAL HISTORY

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HENRY MARSHALL

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TO A NATURAL AND ECONOMIC HISTORY OF THE COCO-NUT TREE,
OR BETTER KNOWN AS LARUM, IN THE INDIES.

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CONTRIBUTION

TO A NATURAL AND ECONOMICAL HISTORY OF THE COCO TREE,
OR AS IT IS COMMONLY CALLED THE COCO-NUT TREE.

THE earliest notice of the Coco Tree which the author has seen is contained in an account of the travels of two Mahommedans in India and China in the ninth century, and a commentary on the work by Abu Zeid. Numerous descriptions of the tree and its products, more or less copious, have since that period been published, but in general the authors have devoted their attention principally to the natural history of the tree, and have given a less comprehensive account of its products, as articles of commerce, than they seem to deserve. With the exception of a paper in the Transactions of the Wernerian Natural History Society, the only monograph description of the coco-nut tree, with which the author is acquainted, is very brief in regard to the uses of the tree, although it was published so late as 1831.

In the following pages, the author has endeavoured to give a comprehensive account of the tree and its products; and has briefly detailed the more important facts which have been published on the subject, together with the result of his own observations during a residence of a number of years in Ceylon.

DESCRIPTION, &c.

The coco tree (*Cocos nucifera*) belongs to the Class MONÆCIA, Order HEXANDRIA, of the Linnean classification of plants. Natural Order, PALMÆ.

Roots slender and flexible, they rise separately like fingers from the stem, and do not penetrate to great depth in the soil.

Stem cylindrical, erect, but frequently leans to one side, crowned with a bunch of about 12 or 14 fronds, (palm leaves,) from 1 to 2 feet in diameter, and from 60 to 100 feet in height, covered with a dun-coloured coriaceous substance resembling bark. The diameter of the stem is increased by the addition of fibrous bundles to the centre, which being newly formed is the softest, and the outside the hardest; the consolidating process goes on in some trees till the outside becomes so hard as to resist the blow of a hatchet. Small roots project from the stem for about two feet from the earth, by

which means the trunk in old trees is much thicker for 2 or 3 feet, than it is higher up.

Leaves (fronds) clustered, forming a terminal head; youngest leaf rises from the centre of the tree, folded closely like a shut fan, and covered with a downy substance. The unexpanded leaves are pale, yellow, and smooth, like fine satin ribbons; mature leaves are dark green; middle leaves are horizontal, rather drooping, from 10 to 15 feet long, and in breadth from 3 to 4 feet, pinnated, or subdivided into two rows of leaflets; common petiole or leaf-stalk naked near its base; leaflets numerous, sword-shaped, about 2 inches broad, placed in two ranks, which are a little inclined to each other.

Spathes or sheaths of the flowers oblong, acute, thick, fibrous, resemble paper in texture, open on the lower side. Admirably calculated to protect the inflorescence.

Flowers axillary, proceed from a large single-leaved pointed spathe. The spadix is spicate: each spike has towards its base one or two female flowers, the others being male. In both male and female flowers, the calyx has three divisions, and the corolla three petals. The male flowers have six stamens, and the female three stigmas.

Fruit about as large as a man's head, clustered, egg-shaped, obscurely three-sided, with rounded angles, external rind, (Epicarp,) thin, even-surfaced, tough. The fleshy part (Sarcocarp) is extremely fibrous; *nut* (putamen) originally trilocular, but two of the cells are commonly obliterated, and one only comes to perfection, nearly globular, hard, one hole at the base, closed with a black membrane, two external depressions resembling holes. *Kernel* (Endosperm) white, nearly $\frac{1}{2}$ an inch thick, in substance and in taste resembling a hazel nut, or filbert, hollow, and containing about a pint of whey-coloured liquor; requires nearly twelve months to become completely ripe. Ripe nuts are known by a succession of the water within them on their being shaken. The embryo, which is a small oval body, is situated at the base or attached part of the nut, immediately under the membrane that covers the hole in the shell. When a coco-nut germinates, the embryo enlarges into a white spongy substance, which in time nearly fills the cavity of the nut. A shoot projects through the hole, which divides into an ascending and a descending portion, the former being the embryo stem, and the latter the rootlets. The water and kernel of the nut supply nourishment to the plantlet, and in the course of time they are in this way entirely consumed. When the shell has fulfilled its important purposes of preventing the exit of the water, and protecting the kernel from external injury, it crumbles into earth, but frequently not until it has been under ground for two or three years.

Matulla.—This is the Singhalese name of a remarkable substance resembling coarse cloth or gauze, which arises at the base and outside of the fronds, especially in young trees. Each portion is obtusely triangular, the base of the triangle adheres to the stem, while the other margins are attached to the stem and back of the frond. When young it has a very delicate texture, and a silvery white colour; the fibres diverge in an oblique direction, and generally there appear two

or more layers of fibres connected by an adhesive substance, which cross each other obliquely. "The length and evenness of the threads or fibres, the regular manner in which they cross each other at oblique angles, the extent of surface, and the thickness of the piece, corresponding with that of coarse cotton cloth, the singular manner in which the fibres are attached to each other, cause this curious substance, woven in the loom of nature, to represent to the eye a remarkable resemblance to cloth spun and woven by human ingenuity." (*Ellis, Polynesian Researches.*)

Varieties of the Coco-nut.—Mr Moon, in his Catalogue of the Indigenous and Exotic Plants of Ceylon, enumerates three varieties with several subvarieties of the coco-nut, namely, the *common*, *eatable-husk*, and *king coco-nut*. There are two kinds of the eatable-husked coco-nut tree, which differ only in the colour of the fruit. It is the base of the husk that is eaten, which in taste and flavour resembles the cabbage or central bud of the same tree. This variety is much less extensively cultivated than the common kind, because it is not considered equally good for making curry, and the ripe nuts will not keep for any length of time. In Mysore, according to Dr Buchanan, (*Travels in Mysore, Canara, &c.*) there are four varieties of the coco-nut cultivated, 1st, red; 2d, red mixed with green; 3d, light green; 4th, dark green. The red is reckoned somewhat better than the other, but they are commonly sold promiscuously, and the produce is nearly the same.

Geographical Distribution.—This species of the palm family is a tropical plant, and requires a mean temperature of 72° Fahrenheit to bring it to perfection. According to Sir John Leslie's Table, (*Malte Brun's Geography*, Vol. i.) the mean temperature of

Lat. 27° is 73° 8	
28	72 7
29	71 9

In the kingdom of Assam, which lies between the 25th and 28th degree of N. L., the tree grows, but it is rare, and no palm wine is made from it. It is found also in the Canary Islands, which lie in the 28th or 29th degree of N. L. Under the equator it grows at an altitude of about 3000 feet.

Cultivation of Coco-nut Trees.—This tree is more or less cultivated on almost every coast and island within the tropics, where it was perhaps in general originally self-propagated. At Pericaul, on the south side of the Gulf of Cariaco, "the-coco tree is the principal object of cultivation. This palm thrives best in the neighbourhood of the sea, and, like the sugar-cane, the plantain, the mammee-apple, and the alligator-pear, may be watered either with fresh or salt water. In other parts of America it is generally grown around farm-houses, but along the gulf it forms real plantations. * * * Throughout this coast a coco-tree supplies annually about 100 nuts, which yield eight flascos of oil. The flasco is sold for 1s. 4d. A great quantity is made at Cumana, and Humboldt frequently witnessed the arrival there of canoes containing 3000 nuts." (*Humboldt's Travels*, Edin. Cabinet Library.) It would appear by this statement that coco-

nut oil fetches a much higher price in America than it does in any part of Asia.

The coco-tree is also cultivated on the Brazilian coast for an extent of 94 leagues. This tree is not indigenous in Pernambuco, but of all the trees which the Europeans have introduced it is by far the most important. The nuts are gathered four times a-year, and form one of the chief articles of trade. No use seems to have been made of the husk of the nut in Brazil until the beginning of the present century when the uses to which it might be applied and the mode of its preparation were pointed out by Dr Manoel Aruda de Camara. (*Southey's Brazil*, Vol. iii.) Coir has for a number of years been extensively manufactured at Recife near Pernambuco.

The coco-nut tree is, however, more extensively cultivated on the Continent and islands of Asia than in America. Pirard de Laval, who visited the Maldivian islands in 1601, states, that these small islands used to export annually about 100 ships loaded with coco-nuts. When he was there 400 coco-nuts cost a larin, which is about 8d. Sterling. The coco-nut tree alone, he says, "might supply all the necessaries of life, for it affords wine, honey, sugar, milk, and butter, besides that its kernel may be eat as bread, of which they have none in that country. Further, most of their utensils are made of the wood, bark, leaves, and nut-shells of the tree." The Mahomedan travellers who visited the Maldive islands in the ninth century state, that "the workmen in these islands are exceedingly expert, and make shirts and vests, and tunics all of one piece of the fibres of the husk of the coco-nut; of the same tree they build ships and houses." At the present time the principal exports from the Maldivian islands are coco-nuts, coco-nut oil, and coir. Indeed, all this group of islands is richly clothed with coco-nut trees. With respect to some of the Malay islands, it is alleged they would not be habitable without this palm, from their want of fresh water. The inhabitants give coco-nut milk (water) to their cattle, and never use any other beverage themselves. In such esteem is this tree held in the Maldive islands, and all along the Malabar coast, that it is a common saying among the inhabitants, "as fruitful, as profitable, as beautiful, &c. &c. as a coco-nut tree. The coco-nut palm is of great importance in some of the provinces south of Chittledroog (Peninsula of India.) Topes of them are seen everywhere and some valleys appear like forests of them." (*Heyne's Tracts on India*.) "At Chinapatnam, in Mysore, there is a tract of land that is about 18 miles in length, and from one mile to a quarter of a mile in width, the whole of which is, with the exception of some small spots, planted with coco-nut and betel palms." (*Buchanan's Travels in Mysore, &c.*) But perhaps the coco-nut tree is nowhere so extensively cultivated as in the island of Ceylon. In 1813, it was estimated that 10,000,000 of trees were growing on the south-west coast only. But as this tree is planted more or less both on the east and west coast of the island, and in many places of the interior, it may be inferred that its cultivation is very extensive. Indeed the produce of the coco-nut and the cinnamon tree are the chief staple commodities of the island. The cottages of the inhabitants are generally surrounded by a number

of palm trees, more especially the coco-nut palm. In the Singha-
lese language a coco-nut plantation is called *poll watte*, while the Eu-
ropean inhabitants call it a *toddy tope*. The word *tope* is probably
derived from the English word *toft toftum*, (Latin,) an enclosed piece
of ground round a dwelling. A ludicrous mistake is said to have been
made by the use of the Anglo-Indian name of a coco garden. In a
letter sent to England by a missionary, it was stated that they preach-
ed to the natives in *topes* of coco-nut trees. This expression was
printed thus in one of the missionary Journals, "they preached to the
natives on *tops* of coco-nut trees." Serious accidents sometimes oc-
cur by the falling of coco-nuts from the tree. From the reports of
inquests which took place in the island of Ceylon during the year
1833, it appears that four persons were killed by the falling of coco-
nuts. It is remarkable that the coco-nut tree has never been intro-
duced into the Andaman islands, although it is very extensively cul-
tivated in the Nicobar islands, which are within 30 leagues of the lit-
tle Andaman.

Soil.—The coco-nut tree grows luxuriantly in the alluvial or sandy
soil, near to the margin of rivers, estuaries, and inlets of the sea.
Koster observes, that the sandy soils of the Brazilian coast, in which
the coco-nut tree seems to delight, would, if they were not cultivated
with it, remain almost useless, but from the produce which this tree
yields, they are rendered very valuable. The lands which are occu-
pied with this plant alone yield a settled income to the owners with-
out much labour. Coco-nut trees are evidently not injured by the
sea air, for they are nowhere more luxuriant than in situations where
the roots are frequently washed by sea water. This palm grows,
however, at great distances from the coast—in Ceylon it is profitably
cultivated in the centre of the island, or about 100 miles from the
sea, and in the peninsula of India 200 miles from the sea.

Propagation, Culture, and Produce.—The fruit of the coco-nut
tree is admirably calculated for diffusion and self-propagation through
the medium of rivers and the ocean. Although the nut and its kernel,
like many other seeds, is perhaps heavier than water, the fibrous husk
with which it is invested gives it sufficient buoyancy in water, by
which means it is conveyed to the most distant coasts, even as far
north sometimes as the coast of Norway. If by chance a coco-nut
be carried by the sea to a favourable spot within the tropics, it ger-
minates and grows, bearing and disseminating many nuts, some of
which by germinating soon form a palm grove, in which birds find
a resting-place. In this manner it is obvious a coral rock may, by
means of sea-weed, in time be converted into an island, and eventually
become inhabited with numerous species of the animal creation. The
evidence in favour of this mode of the dissemination of prolific coco-
nuts is so strong that I think the result cannot be doubted. I am
well aware, however, that the germinating power of many seeds which
are conveyed by the sea is usually lost before they reach a shore.
The doublecoco-nut (*Lodoicea Sechellarum*,) for example, has not,
so far as I know, been propagated through the medium of the sea,
although the nuts are frequently thrown upon the coasts of tropical

islands. Coco-nuts seem to be particularly well adapted for germinating and taking root upon the shelving and irregular surface of coral rocks. The lithophytæ do not build in compact masses, and the shelves are usually intersected with openings, sometimes narrow, and sometimes of considerable width and depth. Coco-nuts have been planted in such shelf holes which have germinated and grow luxuriantly. The shelves are frequently covered with vegetable earth more or less mixed with sand.

Coco-nut plants are raised in the following manner: The requisite number of the ripe nuts are ranged in rows upon a smooth and rather hollow piece of ground, with the base of the nut uppermost. They are covered with a thin stratum of earth, in which state they remain for ten or twelve months, when they may be transplanted from the seed-bed to a tope or garden. The nuts and young plants require to be carefully watered during the dry season. In two or three months after the seed nuts are placed in the bed, the plantlet issues from the earth. The young shoot is much prized as an article of diet, and is sometimes eaten raw, but more frequently it is roasted in ashes or curried. The shoot attains the height of 16 or 18 inches during the first year, and the young bud resembles a bundle of narrow ribbons. The plants are sometimes not transplanted before they are three years of age, and the nut even then adheres to some of them, but not to all.

In the toddy topes or coco-nut orchards, the distance preserved between the plants is usually from 20 to 24 feet. At this distance holes about 2 feet deep are made to receive the plants, and for the purpose of collecting moisture. The holes after they receive the young plants are only partially filled up with earth, and, probably from superstitious motives, a small quantity of salt is frequently placed under the plantlet. For three or four years the plants require to be fenced, so as to prevent them being injured by cattle.

The coco-nut tree if planted in a good soil blossoms and bears fruit at about 5 or 6 years of age. It continues to grow for about 30 years, bears fruit until it is 60 years old, and dies at from 90 to 100. The owner of a tope reaps the reward of his labour chiefly either in nuts, or by extracting a sweet juice, colloquially denominated toddy in India, from the flower, and various circumstances combine to make him prefer one crop to the other. A rotation or succession of crops is in this respect sometimes adopted. Drawing toddy from trees, is said to be a very severe cropping if it be continued for more than one or two years, but when arack, which is distilled from the juice, is much in demand, owners of the coco plantations usually adopt the toddy harvest. When it has been resolved to draw toddy from a tope, the toddy-drawer makes a rope-ring with the young leaves of the tree, 10 or 12 inches long, into which he puts his feet to enable him in some measure to stand on the side of the stem. He places his feet close to the trunk, and then lifts himself up a little way with his hands, and subsequently raises his feet. By the alternate exertions of his hands and feet, he soon reaches the top of the tree. The heads of the trees are connected with coir ropes, or more frequently by means of the stems of creeping plants, by which means

the *chando* or toddy-drawer passes from tree to tree, upon the connecting creepers, assisted by the horizontal fronds. The toddy-drawer's tools are chiefly an earthen chatty or a calabash capable of containing several pints of sweet juice, and a broad knife and sheath, which, along with the calabash, is suspended from a belt round his middle. The mode of drawing the sweet juice will be subsequently described. The toddy is usually collected twice in 24 hours, the contents of each pot being poured into the calabash, which is conveyed to the ground by means of a coir cord, when it is emptied by an assistant toddy-drawer. There are individual native landholders in Ceylon who, according to account, possess 10,000 coco-nut trees on different plantations. The usual annual produce of a tree in this island may be estimated at about from 1s. 6d. to 2s. In Bengal a coco-nut tree is commonly rented at 8 anas, or about 1s. 2d. per annum.

Diseases to which the tree is liable.—The coriaceous epidermis or external rind of the stem of the coco-nut tree is about a quarter of an inch in thickness and very compact, by which means the light and heat of the sun are reflected from it in the hot and dry season, so that the tree is not excited to excessive action. In like manner the peculiarly compact, and in some respects smooth epidermis, especially of the nuts, prevents evaporation and parching in a very dry season; it also prevents excessive evaporation in the wet season, by which means the tree is not exposed to great changes of temperature.

Terminal leaf bud.—This part of the tree is frequently injured by a species of the coleopterous tribe of insects, which is perhaps the *rhinoceros beetle* or *knife-grinder*, and sometimes a tree is thereby killed. The insect excavates a hole in the unexpanded bud, where its eggs are deposited. When the person who has the charge of a coco-nut plantation observes a hole in the cabbage or centre bud, he probes it with a barbed piece of iron, for the purpose not only of killing the grub, but of extracting it from its retreat.

Nuts.—It is alleged that a considerable number of coco-nuts have no kernel. In some parts of India, the ratio of rotten nuts is stated to be as high as from 20 to 30 per cent.

Contraction of the Stem.—In very dry seasons, and especially in elevated localities, the central bud is occasionally not developed to its usual horizontal extent, and as the woody stem retains always its original diameter the trunk remains contracted. The concentric layers or circular rings of wood in exogenous trees which increase outwards, are frequently variable in thickness, so in palms which increase upwards, inequalities in layers occasionally occur. It is worthy of observation, that a number of rootlets commonly project from the stem immediately above the contraction, but they do not extend to above a few inches in length.

External injury.—When the central bud dies, from whatever cause, the trunk is rapidly reduced to dust, and a similar result happens when a stem is permitted to lie on the ground exposed to the various conditions of the atmosphere. The stem will, however, bear considerable injury when the head is not damaged. During the siege of Pondicherry in 1778, a cannon ball fired from the place accidentally struck a tree and passed through the trunk “as if it had gone through a

mattress." In the course of time the perforation was filled up, and the wound perfectly healed.—(*M. Le Goux de Flaix, Phil. Mag.* Vol. xx and xxi.)

Coco-nut trees are occasionally struck with lightning, by which means the head is killed and the tree dies. The destruction of coco-nut trees, by severely injuring the central bud or cabbage, is one of the barbarities of war which is occasionally practised in those countries where this tree contributes materially to the sustenance of man. It is alleged that rats prey on the young nuts, more especially in very dry weather, as they afford not only meat but drink also. Trees are sometimes undermined and uprooted by ants.

SYNONYMS.

Sana pala,	Pali.
Nari Kaylum Tangadra,	Sanscrit.
Nareil,	Hindustanee.
Polgaha,	Singhalese.
Tenga,	Rheede Hort. Mal.
Taygana,	Canarese.
Tenkay, Narica, Kobari,	Telinga.
Kalapay and Nyor,	Malay.
Haari,	Otaheitan.
Cagolli,	Mexican,
Masogua Inaiguaruiba,	Brazilian.
Cay Dua,	Cochin Chinese.
Yai Xû,	Chinese.
Jowrhind,	Arabic,
Narjible,	Persian.
Palma Indica, coccifera angulosa,	Burman. Zeyl.
Calappa Palma Indica Major,	Rumph. Amb.
Cocos Palma,	Loureiro.
Cocotier or cocos,	Labat.
Coco, or coco-nut tree, frequently mis-spelled cocoa,	English.

Many unsatisfactory conjectures have been made with respect to the derivation of the European name of this tree. Dr Johnson derives it from *Cacaotal* (Spanish,) and therefore, he adds, "more properly written *Cacao*." He obviously mistakes the coco-nut tree for the *Theobroma Cacao*, which produces the cacao beans. Mr Booth in his Analytical Dictionary says, "The fruit (of the coco-nut tree) is named *coco* by the Portuguese, from the three holes at the end of the shell, which give it the appearance of the head of a monkey." In all probability the word *coco* and its European synonyms are derived from the Greek word *Kocos* a seed, nut, or shell. Avicenna, who lived in the tenth century, calls this tree *Grafi Alhend*, *Nucis Indicæ*, the nut of India. The old travellers and naturalists give it a similar designation, namely, the *cocos* or *cocustree* of India, which is synonymous with the nut tree of India, consequently this palm should properly be called the *coco* or nut tree, although I have commonly employed the duplicate name by which it is generally known, viz. the coco-nut tree.

ECONOMICAL QUALITIES.

Roots.—The roots are sometimes chewed as a substitute for the areca nut. In Brazil and also in the Tonga islands the natives interweave the roots with plait made of the fibrous bark, and thereby

manufacture them into beautiful baskets, which are sometimes ornamented with beads or shells incorporated in the wicker work.

Matulla.—This cloth-like net-work is much used as a filter, especially for straining toddy and coco-nut oil. It is also employed in some countries as sieves for preparing arrow-root. In the South Sea Islands it is much used by the natives as a substitute for cloth in constructing garments, particularly for individuals who are engaged in such occupations as digging and fishing. Matulla garments are well calculated for fishermen or persons employed on the beach, as they are but little injured by sea-water, whereas articles of dress made of bark-cloth would thereby be completely destroyed. The Papuas of New Guinea seem in general to make the garment which covers the lower part of the body of this substance. Sometimes it is made into sails for canoes. The more slender fibres resemble waxed thread, for which they may be used as a substitute. They are from about 1 to 2 feet in length, according to the size of the tree upon which the Matulla is found.

Stem.—The wood of young trees is, as Linschoten states, “sappy like a sponge, and is not firme” consequently, it is comparatively of little use. The wood of old trees is valuable for a great variety of purposes in the construction of houses, and especially as pillars, wall-plates, and rafters. The best spears of the Otaheitans are made of the coco-nut tree. In India the lower part of the stem is much used in making tom-toms (small drums.) It is now, I am informed, imported into the European markets under the denomination of *porcupine wood*. For domestic purposes the native workmen manufacture potash from the ashes of the stem and leaves.

Leaf-bud.—The unexpanded or terminal leaf-bud is much prized as an article of diet by both Europeans and natives, but as the tree dies when the bud is cut off, it is seldom obtained except when a tree is blown over by the wind. When boiled it is extremely delicate, and resembles a filbert or very tender vegetable. The natives preserve it in vinegar, and eat it as a pickle. An ordinary sized coco-nut cabbage, as the bud is frequently denominated, is about $2\frac{1}{2}$ feet long and $1\frac{1}{2}$ feet in circumference, and weighs from 20 to 30 pounds.

Fronds or leaves.—The mature leaves of coco-nut trees are applied to a great variety of purposes.

Food for Elephants.—Tame elephants are chiefly fed upon coco-nut leaves in Ceylon, and these animals evince much sagacity in preparing them for mastication. They tear the leaflets from the petiole or middle stem of the frond, and switch a bundle of them round the fore-leg, by which means the elastic midrib of each leaflet is separated from the softer margin of the leaves, which is eaten, and the midrib is rejected.

Domestic utensils and other purposes.—The leaves, either entire or divided longitudinally, are manufactured into baskets, lanterns, mats for the ceiling of rooms, carpets, sails for canoes, coffins or baskets for containing dead bodies, temporary tents for covering palanquins, fences, &c. A large portion of the houses and huts in India are thatched with coco-nut leaves, and frequently the walls or sides are constructed of the same materials. When the leaflets are interwoven,

and thereby prepared for thatching houses, &c. they are named *Cadjans* in Ceylon.

Dress, Ornaments, &c.—The inhabitants of several of the South Sea Islands manufacture a kind of mask or vizor of the leaves of the coco-nut tree, which they wear to defend their faces from the scorching rays of the sun. Hats and beautiful bonnets are made of the young leaves by the Otaheitan ladies. They also manufacture a kind of artificial flowers, by extracting the petals of the most fragrant flowers and fastening them upon the elastic midrib of the leaflet. These flowers are sprinkled with scented oil, and worn in bonnets made of the coco leaf. A gentleman who lately visited the Tonga Islands, and who devoted much attention to the dress of the ladies on days of festivity, says, "We admired every ornament until, to complete the dress, quantities of coco-nut oil were lavished over the head, arms, neck, and part of the body." In Ceylon the young leaves are much employed to ornament ball rooms and places of public resort. In the Tonga Islands the warriors have on particular occasions streamers or pennants composed of the young leaf, attached to their heads and arms, full 13 feet long, which, by floating in the wind, produce a most romantic effect, and in the Marquesas and Washington Islands, the official or distinctive dress of the priests is made of coco-nut leaves. The cap or head-dress is thus prepared: A portion of the petiole or middle stem of a leaf is placed perpendicularly over the forehead, and the leaflets still attached to the stem are passed round the head on each side and neatly fastened together behind. In addition to the uniform cap the priests when on duty wear a cape or covering over the shoulders made of the same materials. In Ceylon, labourers sometimes protect themselves from rain while at work by means of a hood or long mantle made of coco-nut leaves.

Marks of respect, emblem of authority, &c.—The practice of showing respect to individuals by means of the branches of palm trees appears to be very ancient.—(See Matthew, xxi. 8, Mark xi. 8, and John, xii. 13,)—The foliage of the palm tribe of plants has been in many countries considered an emblem of joy and victory, and hence the word *palm* is sometimes employed as a synonym of victory and triumph. See Leviticus, xiii. 40. It is remarkable that a similar mode of showing respect by "waving palm branches" prevailed among the aborigines of America when it was discovered by Columbus. In ancient times, when pilgrims resorted to Palestine, they commonly returned bearing a branch of palm tree, which sanctioned mendicity, and hence, they were denominated *palmer*s. Captain Lyons, when describing the amusements of the natives of some parts of northern Africa, informs us, that the dancers "were directed by an old woman, with a torch in one hand, and a long palm branch in the other, and sung in chorus verses which she repeated to them." The young yellow leaves are in Ceylon much employed to evince respect to persons in authority, such as the governor or chief justice. When they travel from one part of the island to another, lines made of the stems of creeping plants are stretched along each side of the road, on which are suspended strips of the leaves.

The leaflets of this tree were until lately the emblem of authority

throughout the whole of the Georgian and Society Islands, and requisitions for property or labour, preparations for war, or the convocation of a general assembly, were formerly made by sending a coco-nut leaf to those whose services or attendance were required. To return or refuse the leaflet was to offer an insult to the person in power. Bunches or strings of the leaflets used to be suspended in the temples, which answered the purpose of rosaries in their devotions. By this means the priest or the worshipper was reminded of the order of his prayers.

Fishing for Cowries.—In this process the plaited branches or fronds (Cadjans) of coco trees are in the Maldiv Islands laid together and lashed up into bundles about the thickness of a wheat sheaf, two of which constitute what is called a *balsa*. On these balsas the fishermen take a number of lines baited with short threads attached to them at every five or six inches distance, and each with a bit of putrid meat for bait, tied by a knot to prevent it slipping off. The shell-fish swallow the bait, knot and all, by which means it is hauled up with the line. When the balsas are loaded they are paddled ashore, and the shells buried until the molluscous animals putrify. They are then washed, and, as Barras states, “being so much better than copper for money, as they neither soil the hands nor render offensive odours.” —*Journal of the Royal Geographical Society*, Vol. ii. 52.

Torches.—The Singhalese use the dried fronds as torches to carry before the carriages and palanquins of Europeans or native chiefs, when they travel during night, as also for their own purposes, especially in catching fish. Torches are also much used by the agricultural population for the purpose of preventing the inroads of wild elephants; every field under cultivation in the interior must be watched for that purpose after sunset. The Singhalese name for torches is *Ooloo attu*, which is corrupted by the Europeans into *Chueles*.

Paper.—The coco-nut leaflet is sometimes used to write upon for common purposes. The leaves of the Palmyra palm (*Borassus flabelliformis*) are more frequently employed as a substitute for paper than coco-nut leaves, being considerably broader. But all the valuable manuscripts in India and the eastern Archipelago are written on the leaves of the *Corypha umbraculifera*, which is called *Codda panna* by the Tamools, and *Talpat* by the Singhalese. This is the Talipot tree or great fan-palm. Talpat simply means palm leaf, from *Tal*, palm, and *pat*, leaf. The ordinary dimensions of the leaf of a talpat book is about 2 or 2½ inches wide, and from 18 inches to 2 feet in length. The texture of the leaves of these three varieties of the palm tribe is very similar. Purchas denominates them most appropriately “leaf parchment.” For this purpose the immature leaves are selected and dried in the shade; they are then dipped for a short time in hot milk or water, and subsequently smoothed or polished by being rapidly drawn round a post. The pen employed to write upon the leaf is an iron stylus or pointed instrument, which, by scratching the surface, makes an impression on it that is easily legible. Sometimes the impression is covered with a colouring substance, such as a solution of gum and lamp-black, coco oil, or cow-

dung, applied in the same manner as engravers cover their copper-plates. The native writers in India write upon palm leaves, which are technically called *ollas*, with great rapidity,—indeed, they direct the stylus with such dexterity that they turn their faces frequently from the leaves and entertain others with talking whilst they are writing. Palm leaves are much more durable than our paper, especially in warm moist climates, such as Ceylon, where paper becomes soft, and is destroyed by insects, and where the ink fades and becomes scarcely legible. Linschoten, who visited India in 1583, gives the following graphic account of a young leaf of the coco-nut tree, and of the uses to which it is applied. “It is as thin as paper, and also white, and is as if it were pleated or prest together as they use to pleat and presse womens huykes in the low countries; it is also long and slender, and hath sometimes fifty or sixty folds or plates in it like a paper book. This the Indians use for paper and books whereon they write, and then it is impossible to get the letters out again, for it is printed thereon with a kind of iron instrument. The Indians call it *olla*, whereof all their bookes, writings, and evidences are made which they can seale and shut up as wee do our letters.” At present *olla* letters are conveyed in Ceylon by means of the regular post in the usual manner. The leaf is rolled up and sealed with gum lac. The most ancient materials for writing upon was stone or brick. In the days of Job sheets of lead were used for a similar purpose, and the pen employed was an iron stylus. (Job, chap. xix. 23, 24.) Plates of copper, tablets of wood, and leaves of trees were also used in ancient times as writing materials. Subsequently the skins of animals were employed. Job speaks of no other pen but the iron style, which is the graver or instrument that is at the present day universally employed in India for writing upon the leaves of the coco, the Palmyra, and Talipot tree. It is highly probable that the leaves of some of the palm family were used for writing upon as early as the time of Job. In chap. xxxi. 35, he speaks of writing “a book,” upon which passage the learned President de Goguet, in his work on the origin of laws, &c. observes, “I cannot imagine what could be the form or materials of books in that age.” The Talipot leaf is sometimes used as paper, and written upon with ink, which is probably the ink commonly employed by the natives of India, namely, a mixture of burnt rice and gum water. There are some beautiful manuscripts of this kind in the museum of the East India Company, Leadenhall Street.

Petiole or stipe and midrib of the leaflet.—The stipe is much used as an oar or paddle, as also to construct fences, and when bruised at one end a brush is formed which serves to whitewash houses, &c. Basket-nets for catching fish, shrimps, &c. are made of the midrib of the leaflet, as also panniers and baskets. It is much employed also as brooms, tooth-picks, pins, and to make sieves, which are used in the manufacture of sago. It has been recommended to be employed as a nucleus for bougies. The South Sea Islanders make combs of this part of the leaf. In India and the oriental islands the dishes used by the natives are commonly portions of the plantain leaf, but individuals of the caste of Brahmans generally eat from plates made of the leaves

of the jack-tree (*Artocarpus integrifolia*,) sewed or pinned together by means of portions of the midrib of the coco-nut leaf. A Brahman is not permitted by the rules of his caste to eat twice from one plate. Javelins or spear handles are made of this part of the leaf,—the requisite number of the elastic fibres being bound together and covered with gum lac.

Spathes.—The membranous sheath which covers the blossoms is inflammable, and it is often employed as torches; in some parts of India it is soaked in water, and converted into coarse cordage. In the South Sea Islands it is employed in a green state by females as an apron or substitute for a petticoat, and in the Maldivé Islands liquid measures are made of this part of the tree.

Gathering of the nuts.—The nuts are collected in Ceylon by persons of the Chando caste or tribe, who ascend the trees in the usual manner, armed with a large knife, which is required to divide the strong stems of the spadix. Even when it is necessary that the nuts should be ripe, they are collected a little before they fall from the trees. “To fetch coco-nuts from trees as they are wanted, the Malays of Sumatra have trained monkeys, which are more expert at the business than any toddy-drawer on the coast of Coromandel.” (*Heyne's Tracts on India, &c.*)—Sir Thomas Raffles informs us, that the species of baboon which is trained for this purpose is the bruh of the Malays (*Simia Carpolegus*.) The natives distinguish three varieties of bruh, one of which is the *Bruh Setapong*. This variety is the largest, and is also the most docile and intelligent of the whole, consequently it is much prized. When sent to gather coco-nuts, he selects the ripe ones, and pulls no more than he is ordered.—(*Trans. Lin. Society*, Vol. xiii. page 244.)

Superstitious uses of Coco-nuts.—In times of unusual sickness, the natives of some of the South Sea Islands, as also the native inhabitants of Ceylon, make offerings of coco-nuts to the supposed offended spirits, which they believe occasion disease. Mariner (*Account of the Natives of the Tonga Islands, &c.*) mentions a charm in the Tonga Islands, which consists in spinning a coco-nut, and, judging by the direction of the upper part when again at rest, of the object of inquiry, which is chiefly whether a sick person will recover. For this purpose, the nut being placed on the ground, a relation of the sick person determines, that, if the nut when again at rest points to such a quarter, the east, for example, the sick man will recover; he then prays aloud to the patron god of the family, that he will be pleased to direct the nut, so that it may indicate the truth. The nut being next spun, the result is attended with a full conviction, that it will truly declare the intention of the gods at the time. The women often spin a coco-nut to decide some dispute at a game. In the Nicobar Islands, a coco-nut tree is cut down when a person dies, and in Ceylon, young coco leaves are suspended over the spot where the body of a chief or priest has been burned.

Miscellaneous uses.—In some parts of India, the coco-nut is employed as a symbol of matrimonial alliance, and in Ceylon the shells of green coco-nuts are occasionally used as lanterns, which are trans-

lucent. A coco-nut is the common present by which the lower classes in India endeavour to conciliate the favour of the upper ranks. In the Maldivé Islands, coco-nuts are the price of labour,—in fact, the circulating medium.

Unripe nuts.—To afford nourishment to the germ and embryo plant, a watery fluid is secreted, which is converted into seed-pulp or kernel. The water contains sugar and a gummy matter, and the kernel is composed of a fixed oil or vegetable butter, albumen and liquid sugar. In chemical composition the kernel is supposed to have a close analogy with the milk of animals, and it is considered to be very nutritive.

The indigenous inhabitants of tropical islands, such as Ceylon, subsist in a great degree upon the water and pulpy kernel of unripe coco-nuts. The water is in “colour like whey, and of that consistency, but in relish far excelling.”—(*Dr Fryer's Travels.*) When drunk fresh from the tree it is considerably cooler than the atmosphere, and consequently very refreshing. “In the Tonga Islands, coco-nut water is the chief drink, as the wells are merely tide wells, which increase and diminish as they rise and fall.” The great Comoro Island, which is 30 leagues in circumference, is said to retain no water in its soil, being volcanic; and the natives are frequently obliged to satisfy the thirst of their cattle with coco water, and never drink any other beverage themselves. The pulp or soft kernel of a young coco-nut, has been not inappropriately denominated a vegetable blanc mange. It may in this state be eaten with a spoon, and when a little Madeira wine, lime juice, sugar, and nutmeg are added, the mixture is generally considered very delicious. The confectioners of India make and vend nearly 100 sorts of sweetmeats, and the kernel of the coco-nut is the principal fruit which enters into their composition. In a more mature state, the kernel is eaten by the natives of the Ladrone Islands in place of bread. The natives of the Sandwich Islands prepare a rich sauce with very finely grated young coco-nuts, which undergoes before use a slight degree of fermentation. This sauce is prepared with much care, and being deemed a great luxury, it is usually considered an essential dish at their public entertainments. Coco-nuts are eaten both by domesticated and wild animals. Captain Hamilton, (*A new Account of the East Indies, &c.*) informs us, that all the domestic animals in the Nicobar Islands are fed upon coco-nuts and sea water, and that upon this diet hogs become remarkably fat. According to another authority, when pigs are fed with the water and kernel of coco-nuts, the meat is firm, and has a delicious taste, even superior in colour and flavour to the best English veal. In some of the South Sea Islands Mr Montgomery, (*Journal of Voyages and Travels by the Rev. Mr Tyerman and Mr Burnet,*) informs us, that the land crabs live under the coco-nut trees, and subsist upon fruit which they find on the ground. With their powerful front claws they tear off the fibrous husks; afterwards inserting one of the same into a hole at the end of the nut, they beat it with violence against a stone until it cracks. The shell is then easily pulled to pieces, and the kernel devoured at leisure. Sometimes, by widening the hole with

one of their round gimblet claws, or enlarging the breach with their forceps, they effect sufficient entrance to enable them to scoop out the kernel without breaking the nut. These crabs burrow under the coco-nut trees, prudently storing up in their holes large quantities of nuts stripped of the husk, at those times when they are most abundant, against the recurring intervals when they are scarce. The *Birgus latro*, a species of sea crab, frequently quits the sea, and ascends the coco tree and other palms for the sake of their fruit. These crabs are very fond of the fruit of the coco palm, and may be fed with it for months, without their suffering from want of water.—(*Kirby's Bridgewater Treatise*, Vol. ii. 48.)

Ripe nuts.—Unripe nuts are designated by the Indo-Portuguese inhabitants *Lania*; when ripe they are called *curry coco-nuts*, as being fit for yielding milk adapted for cooking. The ripe kernel is much used in India as an article of diet by the natives, and it is commonly eaten with jagery (coarse sugar.) In this country it sometimes appears on the tables of the wealthy as a dessert.

Coco-nut emulsion or milk.—To prepare coco-nut milk, the ripe kernel of a nut that has been divided into two is in Ceylon reduced to the size of common saw-dust, by means of an instrument called *Hiromane*, which is a notched circle of iron, fastened to the raised end of a piece of wood. The hiromane is the best kind of grater that can be employed to reduce the kernel to the requisite size, because it obviates the necessity of removing it from the shells, which in a ripe state is rather difficult. The grated kernel is put into a cloth with a little water, to which pressure is then applied, and the milk passes through the cloth. This emulsion is the true coco-nut milk, which closely resembles cow's milk in colour and consistence, and ought not to be confounded with the water found in the hollow kernel; it contains the oil of the kernel suspended in water by means of mucilage and sugar.

Uses of the emulsion in the arts.—The inhabitants of India and the oriental Archipelago prepare the rose-coloured *Chunam* (lime,) which they chew with their betel, by mixing common *chunam* with coco-nut milk. It is much employed in the dying of chintzes, and also in dying a black colour.

Uses of the emulsion as an article of diet. “Of the white of these nuts in India, they make pottage and dresse meat withal, straining and pressing out the milke, wherein with many other mixtures, they seeth their rice, and to bee short, they never dresse any rice which they call *carryl*, and is the sauce, to their meate thereunto, but they put some of their *cocus* milk into it.” (Linschoten.) Perhaps the word *carryl* is synonymous with the better known name of an Indian dish *curry*. The word *curry* is probably derived from the Hindoostannee verb *Qoormu* to stew. In the Singhalese and Malabar languages it is called *cathy*. The dish denominated *curry* is in Ceylon chiefly prepared by means of coco-nut milk. For example, a chicken divided into small portions is stewed in the requisite quantity of the milk, along with a due proportion of hot seeds, spices, and

other articles of seasoning. In a similar manner, meat of various kinds is dressed, such as mutton, kid, &c.; as also fish, shrimps, eggs, and vegetables. Curried meat or vegetables, prepared with coco-nut milk, forms the principal and best food of all classes of natives, from the highest chief to the cooly or day-labourer. Europeans of all ranks soon grow extremely partial to a diet, which is not only agreeable to the palate, but very easy of digestion, and sufficiently nutritious.

In Bengal and many other places in India, curry is prepared by frying small portions of meat or fish, &c. in *ghee* (clarified butter,) with a very little water and a due admixture of spices. A Bengal curry is a highly seasoned ragout. Curry is generally eaten with rice. The following is a specimen of the mixture of hot seeds and spices used in the composition of "*curry stuff*" in Ceylon, as well as on the Continent of India.

Coriander seeds, 6 drachms
 Turmeric, 1 do.
 Fresh root of ginger, $4\frac{1}{2}$ do.
 Cummin seeds, 1 scruple
 Black pepper, 3 do.
 Poppy seed, $1\frac{1}{2}$ drachm
 Garlick, 2 heads
 Cinnamon, 2 scruples
 Cardamoms, 5 seeds
 Cloves, 8 heads
 Chilly or capsicum one or more pods, according to taste
 Half a lime.

The whole of the above ingredients are ground between two stones, first separately, and then together, and formed into a paste. Half a coco-nut rasped will supply the requisite quantity of milk. The quantities stated are sufficient for currying one fowl or a pound of meat. The curry stuff of the common people is chiefly composed of red pepper (chillies) salt, lime-juice, and the dried skin of the *goraka* (*Garcinia gambogia*,) a pleasant tasted though acid fruit, about the size of a small orange. Much might be said in favour of curry, especially of coco-nut curry, as an article of diet; but on this topic I shall content myself with quoting the opinion of Edward Terry, Master of Arts, and Student of Christ's Church in Oxford. Mr Terry went to India as chaplain to Sir Thomas Roe in 1616, and published an account of his voyage to the "Easterne India." "In regard to the diet of the natives of India," he says, "they have not many roast or baked meats, but stew most of their flesh. Among many dishes of this kind, I'll take notice of one they call *Deu Pario* (which seems to be *Qoor-mu*, spelled by the ear curry), made of venison, cut in slices, to which they put onions and herbs, some roots with a little spice, and butter, the most savourie meate I ever tasted, and doe almost think it that very dish which Jacob made ready for his father when he got the blessing."

Coco-nut emulsion is sometimes used as a substitute for cow's milk in tea and coffee, as also for dressing sago. Dampier informs us, that "in this milky water they boil a fowl or any other sort of flesh, and

it makes very savoury broth." The grated kernel sometimes enters largely into the composition of puddings, and it is also frequently mixed with rice. In almost all the South Sea Islands the indigenous inhabitants live much upon meat, fish, fruits, and roots, dressed in coco-nut milk, which furnishes an oleaginous substance, or vegetable butter, much suited to the general taste of mankind.

The Otaheitans prepare a sauce with ripe nuts by cutting the kernel into thin slices, and putting it into a calabash with salt water, in which it is shaken every day until the nut is dissolved. This mixture is eaten by the natives as sauce to their fish, bread-fruit, and almost every other article of food.—(*Ellis*, Vol. i. 65.)

Preparation of coco-nut oil by decoction.—The ripe kernel after being cleared of the brown membrane which adheres to its outside is boiled in water, and then pounded in a *wang-gadea* or large mortar, hollowed out of the trunk of a tree. The solid parts are then separated from the emulsion or milk, which is boiled over a slow fire until the oil floats on the top, when it is skimmed off with a coco-nut shell laddle. Sometimes the oil is boiled a second time.

As the process of boiling the emulsion is tedious and comparatively expensive, a more economical method is occasionally practised; it is left exposed to the air for a night, during which period the oily portion of the emulsion rises to the top, when it is skimmed off, and purified by a very short boiling. In Otaheite the grated kernel is exposed to the sun, and in the course of time the oil separates spontaneously, when it is eventually put into bamboo bottles, and in this way it is brought to market. The quantity of oil yielded by decoction is variously stated. Bartolacci informs us, that on an average ten nuts will yield about a quart of oil. Another Ceylon authority says, "two quarts of oil will be the product of fourteen or fifteen coco-nuts." Dr Camara, quoted by Koster, states, that he made the experiment, and found that thirty-two nuts yielded only three pounds of pure oil.

Physical qualities of coco-nut oil.—This oil fuses at a temperature of about 80° of Fahrenheit, and it becomes concrete at 77° or 78°. In this country it has a yellowish white colour, and a consistence resembling soft tallow.

Preparation of coco-nut oil by expression.—After clearing the nut of its husk, the kernel is exposed by breaking the shell with a heavy crooked knife; an operation which is generally effected by one blow. The divided nuts are then spread upon an open platform made of bamboos or laths of the *Areca* tree, under which a charcoal fire is placed, which is kept up for two or three days, in order to dry the kernels. After this process is completed, they are exposed to the sun on mats, as a preliminary measure to their being put into the press. The kernels being separated from the shell are then called *copra* or *copperas*. The native machine or mill used for extracting coco-nut oil consists of the trunk of a tree hollowed out into a large vase or mortar, in which an upright cylinder is turned by means of a horizontal beam worked by two oxen. The machine is usually erected in the open air. Dr Buchanan informs us, that the mill or

mortar is in India charged with about 93 pounds of copperas, and 3 quarts of water, and that the product is nearly 8 gallons of oil, equal to 64 pounds, so that 24 ounces of copperas will yield 16 ounces of oil. The oil cake is called *pohak* in Ceylon, where it is chiefly employed to feed pigs, poultry, &c. but on the peninsula of India the natives eat it dressed in various ways.

Miscellaneous uses of coco-nut oil.—Coco-nut oil prepared by decoction, and in a fresh state, is used by the natives of Ceylon as an article of diet, especially for frying cakes, fish, &c. When newly prepared by decoction it has no disagreeable odour, but it soon becomes very offensive to Europeans. This oil has, I am informed, been successfully used in the manufacture of cloth, as a substitute for olive oil. Glass-blowers prefer it to all others in their operations; mixed with crude turpentine as it exudes from pine trees, it is much employed for smearing sheep. Combined with dammer, a kind of turpentine or rosin, that flows spontaneously from the *Pinus Dammara* which grows in Ceylon, Sumatra, and the Malay peninsula, and the mixture heated or melted, a compound is formed, which is much used to pay the seams of ships. The same compound is employed in India to protect the corks of wine and beer bottles from the depredations of white ants. The mouth of the bottle after it is corked is first dipped into the melted compound and immediately after into siliceous sand. This apparently impregnable shield is not always successful in resisting the inroads of these insects. The process of mummification is said to be promoted by means of coco-nut oil. The method pursued at Otaheite for desiccating the human frame is to keep the corpse constantly wiped, dry, and well lubricated with oil. (*Beechy's Voyage, &c. page 125.*) In some of the South-Sea Islands, the oil is employed as currency in the exchange of commodities. The London Missionary Society received contributions of coco-nut oil from the natives of Otaheite, which seem to have been not always cheerfully bestowed. On one occasion a man brought a contribution of oil to King Pomari, and said in an angry tone, "Here are five bamboos of oil, take them for the society. No, said the King, I will not mix your angry bamboos with the missionary oil; take them away." According to Pomari's revenue laws, the governor of a district is to pay annually "two hogs or ten measures of arrow-root; if not this, coco-nut oil ten bamboos full; they must be good-sized bamboos."—(*Ellis.*)

Light-giving uses.—Coco-nut oil is used in India by all ranks, both European and native inhabitants, as a lamp oil. Mr Deville, of the Strand, London, who has paid much attention to the illuminating qualities of different gases, is of opinion, that the gas-light from coco-nut oil has so far the quality of day-light, that with it the difference between flower of sulphur and wheat flour may be easily distinguished, which he was unable to do with any other artificial light.

Elaine and Stearine of Coco-nut oil.—A patent was taken out in this country in 1829 for a process by which the crude oil may be separated into two substances, namely, a pure limpid oil (*Elaine*), and an unctuous solid substance (*Stearine*). The separation is effected by means of great pressure. The crude oil is put into linen bags, which are covered with strong canvas, laid flat upon the ho-

horizontal bed of a hydraulic press, and submitted to compression. A liquid oil, the (*elaine*) is thus obtained, which is free from smell, and proves to be an extremely good lamp oil. The contents of the bags are then put into a tinned copper boiler, and submitted to heat, in a steam bath, and the heat is kept up for a sufficient length of time to allow the impurities to subside. The stearine thus procured, which amounts to about 30 per cent. of the crude oil, has a firm consistence and a fine glassy whiteness. The *elaine* or fluid oil is purified by an admixture of from one to two per cent. by weight of the sulphuric acid of commerce, diluted with six times its weight of water. The acid solution and the oil are violently agitated together for some time, and afterwards allowed to settle. Some impurities subside, which are separated from the pure oil by filtration through thick woollen cloth. The operation of expressing coco-nut oil is carried on while the temperature varies from 50° to 65°. The lower the temperature at which the separation of the *elaine* from the stearine can be effected the better will be the quality of the fluid oil. There is a large manufactory of *elaine* and stearine of this kind in operation near to Vauxhall Bridge, London.

Uses, Candles, Soap.—The fluid oil is well adapted for burning in lamps, but the temperature of the atmosphere should not be much below 60° Fahrenheit, as it is apt to become thick when the temperature is low. It may also be employed for sharpening instruments, oiling clocks, &c. This pure oil is retailed at the rate of 4s. per gallon. Candles are made of the *stearine* or solid matter, which rival wax in appearance and durability; they burn with a pure white flame, and emit a steady light. They are retailed at from 10d. to 1s. per pound. Some manufacturers of soap employ a considerable quantity of crude oil along with the common materials used for making that article. It is alleged that a certain portion of coco-nut oil has the effect of preventing soap from cracking in dry weather. Candles of a remarkably good quality have been made of coco-nut oil, by first manufacturing it into soap, from which the alkali used is subsequently separated by means of an acid. The residual mass is well washed with water, and afterwards submitted to a hydraulic press; it is then melted and made into candles. The candles thus prepared are as white and hard as those made of wax or spermaceti. The manufacture of candles by this process was, I am informed, first tried in Berlin.

Trade in Coco-nut oil.—Until lately the importation of coco-nut oil into Europe has been liable to much waste by leakage through the wood of the casks. This circumstance has been completely obviated in Ceylon by filling the casks, and exposing them to the sun for some time, and occasionally rendering the hoops firmer. Coco-nut oil is also sometimes imported in iron tanks, but this mode is liable to many inconveniences, and it is therefore much disliked by captains of ships. In India where coco-nut oil is always fluid, it is easily pumped, or otherwise introduced into the tanks; but as it becomes more or less solid at between 70° and 80° of temperature it is not so easily removed to a merchant's store, when it is imported in tanks as in casks.

The casks are generally leaguers, which contain 150 gallons, and the export price is commonly from L. 6, 10s. to L. 7 per leaguer. The custom duty levied upon oil imported into this country is 1s. 3d. per cwt., and the ordinary price of oil in the market varies from L. 30 to L. 36 per ton, or from L. 15 to L. 18 per leaguer. There is a considerable quantity of an inferior quality of oil exported from the Society Islands. The trade in this, as also of some other articles of commerce, is said to be chiefly in the hands of the missionaries. In the London prices current coco oil is (1835) quoted at from L. 1, 9s. to L. 1, 13s. per cwt.

Husk or fibrous covering of the nut.—To remove the husk an iron spike or a sharp stake of hard wood is fixed in the ground. The nut is forced by a sudden impulse upon the point, which passes through the fibres, by which means the rind is separated from the shells. In this manner a man can clear 1000 nuts daily.

Uses of the husk.—The husk of coco-nuts is in India much employed as fuel, to clean and polish furniture, to scour the floors of rooms, &c. &c. It is also used by gardeners for propagating trees by layers in the following manner: Two sections of a husk are firmly bound round that portion of a tree which it is intended to separate from the parent stem, and they are kept moist by suspending a coco-nut shell over them filled with water, having a very small orifice, so as to permit the water to pass through in drops. By this means the development of roots is promoted in the husk, when the branch becomes an independent plant. In the Comora Islands, according to Sir Thomas Roe, the inhabitants used coco husks as towels. Boiled for a short time in a solution of nitre, the husk used to be much employed in India as match.

Manufacture of Coir, Koir, or Coira.—The husks of coco-nuts not completely ripe are chiefly employed for this purpose. They are soaked like flax for three or four months in a tank, pond, or stream of water, they are then washed and beaten with a block of ebony upon a stone. After being dried the fibrous matter is again beaten until the interstitial substance is completely separated from the purely fibrous portion of the husk. Subsequently it is rubbed with the hand and pulled like hemp. It is then spun into yarns or sinnet for the purpose of being manufactured into cordage of all sizes, or applied to other uses. The fine yellow colour of coir shows that the husks had been steeped in clear running water. The excellence of coir depends chiefly upon its being effectually cleaned from the ligneous fecula with which the capillary filaments are connected. Dr Camara obtained six pounds weight of coir from the husks of forty coco nuts. (*Koster's Travels in Brazil.*) Forty nuts yielded from an experiment lately made in London 105 ounces or $6\frac{1}{2}$ lbs. of fine coir.

Miscellaneous uses of Coir.—Coir is much used in India to stuff mattresses, saddles, cushions for couches, &c. &c. It is also employed to make brooms, and brushes to white-wash houses. It is universally used in India by the natives as *oakum* in the construction of their boats and ships. Coir swells more with water than hemp, and therefore it makes better oakum than old ropes. Nets for catching fish are made

of it, as also a coarse kind of cloth. Door mats of an excellent quality manufactured of coir, are now hawked about the streets of London and Edinburgh. In Java coir is twisted into a rope of a loose texture, which is called by the Javanese *Tallie apie* (fire rope,) which continues ignited for a long time, and is on that account used for lighting *Cherroots* (cigars.) The Dutch gentlemen in Batavia usually travel with a tallie apie suspended under the carriage, for the purpose of having it always at hand when wanted. Tallie apie is also used as rope match for artillery. Coir has lately been introduced into this country by a gentleman who resided many years in Ceylon, as a substitute for horse hair, straw, flock, cotton, *Zostera marina*, and other substances which have been employed for mattresses, pillows, cushions, &c. It can be furnished at much less than half the price of horse hair, and its elastic property approaches nearer to that substance than any other which has yet been discovered. It is not liable to get into hard knots, like flock, cotton, or tow, and it is much less injured by damp or moisture than any of these substances. Coir might be with advantage employed as a substitute for horse hair, flock, straw, &c. especially in soldier's barracks, seamen's hammocks, as also in hospitals, lunatic asylums, prisons, convict ships, and other large dormitories. Might coir not be manufactured into paper?

Coir cordage.—This article has for time immemorial been universally employed in India and the oriental Archipelago in the manufacture of ropes, and always without the use of tar. It is much used for connecting or sewing together the planks or timbers of boats; the Massaula boats, for example, which, on account of their elasticity, resist the force of the heavy surf on the Coromandel coast infinitely better than the best English built boats. "The ship wherein I came out of India into Portugal had no other ropes nor cables, nor any such kind of stuffe, but such as were made of Indian *Cocus*, called *Coir*, which continued very good, saving only that we were forced every fourteen daies to wash our cables in the sea, whereby they served as well as cables of hempe."—(*Linschoten.*) A similar mode of preserving coir cables is adopted in the present day. Until chain cables were introduced, coir cables were generally used in the ships which navigated the Indian Ocean, and perhaps they are still much employed. At present coir cables are employed for mooring ships in the harbour of Port Louis, Mauritius. Coir cordage, when properly prepared, is pliable, smooth, strong, and elastic: it is very well suited for running-rigging, more especially where lightness is deemed an advantage, such as top-gallant studding-sail sheets, &c. On account of its elasticity, seamen used to consider it not well fitted for standing rigging, but a plan has recently been adopted for the purpose of remedying the defect, which consists in stretching the rope, and, in the language of seamen, serving it with tarred cloth and spun-yarn. Coir cordage is so much better adapted for tropical climates in the opinion of many Captains of ships that they reeve a set of coir rigging when they reach the tropical seas, which they use until they return to a temperate climate. Dr Roxburgh, in his observations on the comparative strength of English hemp and other vegetable fibres, states, that

he found hemp rope and coir rope, when large, to be respectively as 108 to 87 in strength, and when smaller as 65 is to 60. In the same paper (*Transactions of the Society of Arts*, Vol. ii.) he says, "Coir is certainly the very best material yet known for cables, on account of its great elasticity and strength. Coir cables are said to be greatly preferred to hemp cables in India. They are exceedingly buoyant and strong, and by being very elastic they stretch considerably without straining a vessel; so much so that, with a cable of 120 fathoms, a ship will retire or give way sometimes half its length when opposed to a heavy sea, and instantly shoot a head again. Ships occasionally founder at anchor with hemp cables, which might have been saved by means of elastic coir cables. They are also not so liable to rot or to exhale moisture as hemp cordage.

Trade in Coir.—With the exception of the Maldiv Islands, Ceylon is the only place which exports coir in large quantities. "It is supposed that in the Dutch time 3,000,000 of pounds of this substance were manufactured in the districts of Colombo, Matura and Point de Galle. (*Bartolacci, Commerce of Ceylon.*) I presume the author means that the above quantity was manufactured annually. Coir is commonly exported in coils of about 390 lbs. weight, and a quantity of pounded salt is usually sprinkled upon it. In 1825, Ceylon exported 5788 coils of coir, equal to 2,260,109 lbs. valued at L. 10,000, being a little more than 1d. per pound. Manufactured coir, such as cables, hawsers, &c. may be exported, duty free, but loose coir is liable to an export duty of 6d. per cwt. Coir rope, upon being imported into the United Kingdom, pays a duty of 5s. per cwt. Old rope fit for mats only is admitted upon paying 5s. per ton. In the Tonga Islands coir is prepared in considerable quantities, which is exported to New South Wales, where it is, according to account, sold at L. 40 per ton, to be manufactured into rope. The word *coir* seems to be an Indian appellation for the prepared husk of the coco-nut. *Kohu* is the Singhalese, and *kowra* the Tamool name of this substance. In the Tamool language *cowerree* means a rope or cord, so that coir may be derived from the Tamool word for a rope, which it resembles in sense as well as in sound.

Uses of coco-nut shells.—"The huske being taken off, the shell serveth for many uses, as to make ladles with wooden handles, and also certaine little pots, which being fastened to a sticke, they doe therewith take and lade water out of their great pots; they make thereof also small vessels to bear wine in, when they walk into the fields, and a thousand other things."—(*Linschoten.*) A coco-nut-shell forms the most important part of the smoking apparatus of the natives of India. Half-full of water, with two hollow bamboos fitted into holes bored into it, and an earthen *chilum* to contain the tobacco at the top of one of them, it forms their *hubble-bubble* or *hukka*, which is an indispensable companion to the Mussulmans in India. Coco-nut shells and gourds are the only vessels used by the natives of the Society Islands.

The Venah, Vina, or Been, a musical stringed instrument of the guitar kind, much esteemed by the Singhalese, is in part constructed

of two sections of a coco-nut-shell, each of which is covered with the skin of a lizard, and perforated below. Coco-nut shells are sometimes manufactured into beads for rosaries. The use of beads in devotion was known to the Hindoos long prior to our era. Brahma is represented by very ancient monuments as counting a rosary of amber, at each recitation of the name of God. (*Thomson, Etymons of English Words.*) Water bottles are also made of them, some of which will contain a quart. The shell is scraped thin, and when well prepared it is in some degree translucent. As a preliminary measure to this preparation, the nut is buried under ground for a few months, during which period the membrane which covers the natural orifice at the base falls out, and the kernel becomes softened, so that the cavity of the shell may be easily emptied. Coco-nut cups occasionally appear on the tables in this country as sugar basins; when well polished, they resemble, as old Gerard says, "burnished horn." Excellent cups are made of them in India, by simply rubbing off a portion of the base or lower end upon a stone. In India much use is made of the shell of the double coco-nut, especially by fakirs.

At Monte Video, in South America, the ladies drink an infusion of *matte* (Paraguay tea,) from highly ornamented coco-nut cups. They extract the tea from the cup by sucking it through a long silver tube. The common ladle used in great part of India and Brazil is formed of a part of a nut, to which a long wooden handle is fixed. In America, they have even given a name to the instrument, for ladles made of silver are called *silver cocos*. By the inhabitants of some of the oriental islands they are employed as a measure for ascertaining the quantity of both dry and fluid substances. Their capacity is known by the number of cowries (*Cyprea moneta*) they will contain. Hence there are cocos of 500 or 1000 cowries, and so on. They are used as fuel by the Indian washermen, to heat their smoothing irons, and when converted into charcoal and mixed with lime they are employed to colour the walls of houses.

Trade in coco-nuts.—The export trade in coco-nut is nowhere carried on so extensively as in Ceylon. In 1825, this island exported 6,933,552 nuts, chiefly to the peninsula of India, which were valued at L. 7561, being a little more than one farthing each. The export duty is 4d. per 100. The Maldiv Islands export a considerable quantity of coco-nuts as well as the Nicobar islands. Most of the country ships which are bound to Pegu from either the Malabar or Coromandel coast of India touch at the latter islands, in order to procure a cargo of coco-nuts. The captains used to purchase them at the rate of four for a tobacco leaf, and 100 for a yard of blue cloth. One bottle of coco-nut oil was at the same place exchanged for four leaves of tobacco. Coco-nuts imported into the united kingdom used to pay a duty of 5s. per 120, but in 1832 the duty was reduced to 1s. per 120, when imported from a British possession, and 20 per cent. *ad valorem* when from the possessions of a foreign state. In the London market the price of coco-nuts is from 10s. to L. 1, 10s. per 120. In Ceylon the price of seed nuts varies from 18s. to L. 1, 4s. per 1000.

Toddy, Sura, Mee-ra, sweet juice.—The proprietors of coco-nut plantations in the peninsula of India, and in the Island of Ceylon, instead of collecting a crop of nuts, frequently reap the produce of the trees by extracting sweet juice from the flower-stalk. When the flowering branch is half shot, the toddy-drawers bind the stock round with a young coco-nut leaf in several places, and beat the spadix with a short baton of ebony. This beating is repeated daily for ten or twelve days, and about the end of that period a portion of the flower-stalk is cut off. The stump then begins to bleed, and an earthen vessel (*chatty*) or a calabash is suspended under it, to receive the juice, which is by the Europeans called *toddy*. The indigenous inhabitants of the Malabar coast and Ceylon call it *sura*, and when drawn in a particular manner for being converted into jagery it is demoninated *mee-ra*. The word *toddy* or *terry* is a corruption of the Sanscrit word *taree*, liquor drawn from a palm tree. *Sura* in all probability is derived from the Persian word *shir*, liquor or juice, or the Arabic word *shurab*, wine, hence also our word *shrub*, and *sherbet*; *mee-ra* in the Singhalese language means sweet-juice.

A thin slice is taken from the stump daily, and the toddy is removed twice a day. A coco-nut-tree frequently pushes out a new *spadix* once a month, and after each spadix begins to bleed it continues to produce freely for a month, by which time another is ready to supply its place. The old spadix continues to give a little juice for another month, after which it withers, so that there are sometimes two pots attached to a tree at one time, but never more. Each of these spadices, if allowed to grow, would produce a bunch of nuts from two to twenty. Trees in a good soil produce twelve bunches in the year, but when less favourably situated they often do not give more than six bunches. The quantity of six English pints of toddy is sometimes yielded by a tree daily.

Uses of Toddy.—Linschoten says, “*Sura* is very pleasant to drinke, like sweete whey, and somewhat better.” Toddy is much in demand as a beverage in the neighbourhood of villages, especially where European troops are stationed. When it is drunk before sunrise, it is a cool, delicious, and particularly wholesome beverage, but by eight or nine o’clock fermentation has made some progress, and it is then highly intoxicating.

The “strong drink” of the Old Testament was perhaps in some instances toddy extracted from the date palm. Dr Moseley, in his Treatise on Sugar, states, that the Hebrew word *shecar* is in our English Bible every where rendered “strong drink,” and in the Latin paraphrase it is denominated *sisera*, which by being corrupted into *sidera*, is the origin of our word *cyder*. We are informed by St Jerome, that *siker* or *shecar*, was used to designate any kind of exhilarating or intoxicating liquor. *Shecar* seems to be nearly allied not only in sound but in the quality of the article designated to the Persian *shir*, and the Tamool *sura* (toddy.) The writer of the article *coco-nut tree* in one of the Cyclopedias now in the course of publication has made a singular mistake with regard to the Anglo-Indian name of a coco plantation. He says, “The place where this drink (*sura*)

is manufactured, is called by the English a "toddy tap," and where any one may be supplied with a draft on very low terms."

Yeast.—Fermented toddy is universally used by the bread-bakers in Ceylon as yeast, for which it is said to be an excellent substitute. It has been observed that sea biscuit baked in India with toddy yeast keeps longer, and is superior in quality to biscuit which is baked in Europe.

Vinegar.—To prepare vinegar, the required quantity of toddy is put into jars, which are partially covered. After the lapse of a few weeks, the toddy is strained and returned to the jars. A few pods of Chili pepper (*Capsicum frutescens*,) and also of the horse radish tree (*Hyperanthera moringa*) are added to it. In the course of four or five weeks, the toddy is converted into excellent vinegar, which is much used in Ceylon for pickling a great variety of vegetable substances.

Arack.—The principal use which is made of toddy in Ceylon is to convert it into ardent spirits. From toddy arack is distilled in the same manner as brandy from wine, by means of a common still, and, according to Bartolacci, it yields by two distillations about one-eighth of ardent spirits, of the same strength as good brandy 25 under London proof. Toddy is said to be very similar in strength, in as much as the same quantity of arack may be distilled from sweet juice obtained from very different soils. It is also alleged by the Ceylon distillers, that they obtain the same quantity of arack from new toddy as from that which has been kept for several days. At the end of twelve or fourteen days it is so acid that it cannot be distilled into arack. With respect to the quality of arack in the sixteenth or seventeenth centuries, I may quote Linschoten and Dampier, "This sura," says the former, "being distilled, is as excellent *aqua vitæ* as any is made in Dort of their best Rhenish wine, but this is the finest kind of distillation." Arack, says Dampier, "is distilled from rice and other things in the East Indies, but none is so much esteemed for making punch as the sort made of toddy, but it must have a dash of brandy to hearten it, because this arack is not strong enough to make good punch of itself." The strength of arack is ascertained in Java by the following process: A certain quantity of the spirit is burnt in a saucer, and the residuum is measured; the difference between the original quantity and the residuum gives the measure of the alcohol lost. The word arack (which seems to be derived from the Arabic word *urug* or *urak*, juice or spirit,) is employed synonymously with ardent or distilled spirits, over the eastern hemisphere. In Dalmatia arack is drawn from the husks of grapes; in Tartary from sloes and dog-berries, plumbs, &c., and also from milk; at the Cape of Good Hope from *brandywynbusch*, (*Grewia flava* or *orientalis*); in Ceylon from coco-nut tree toddy; on the Continent of India from toddy, molasses, jagery, rice, and even the bark of some trees, hence the term *puttah* or bark arack; in Batavia, China, and Loochoo, where the word is corrupted into *lackie*, from rice, sugar, &c. Arack is also distilled from mahwah flowers.—(*Basia longifolia*.) Mahwah arack may be procured in some parts of India at the rate of an English pint for

one penny. Arack of an inferior quality, from whatever substance it may be extracted, is commonly denominated *pariah arack*, the word *pariah* being used all over India as a degrading epithet. The English word *grog* is also derived from *urak*; and *punch*, which is commonly supposed to be a corruption of *potus nauticus*, Mr Thomson thinks, may be derived from the Sanscrit words *pun*, beverage, and *cheene* sugar.—(*Etymons of English Words*.) Mr Booth says, “The name punch is given on account of the *pungency* of the lemon, the juice of which enters into the composition of that beverage.”—(*Analytical Dictionary*.)

Trade in Arack.—Ceylon is perhaps the only place in the world where a large quantity of toddy-arack is manufactured for exportation. The mean annual quantity exported from this island for eight years, or from 1806 to 1813, inclusive, was 5200 leaguers, each containing 150 gallons, or 780,000 gallons. The chief part of this quantity was exported to the presidencies of Bengal, Madras, or Bombay. Arack used to be, and perhaps is still, issued to the European troops in India, as part of their regular diet; and the seamen belonging to the Royal Navy in the Indian seas are supplied with this spirit in place of rum. In 1813, the Madras Government imposed an excise duty of 440 per cent. upon Ceylon manufactured spirits. Notwithstanding this very high duty, Ceylon has continued to export a considerable quantity of arack, chiefly to India. In 1825, it amounted to 611,218 gallons, which was valued at L. 21,500, or about 8½d. per gallon. Arack is liable to an export duty of 18s. per leaguer of 150 gallons.

Preparation of Jagery.—Jagery, which is a coarse kind of sugar, is obtained by evaporating the watery part of the sweet juice (technically called in Ceylon *mee-ra*), which exudes from a section of the flowering spadix. A clean dry calabash or earthen-ware chatty is suspended under the stock, into which a few pieces of the bark of the *holghas* (*Vateria Indica*) are thrown, and generally a small quantity of *chunam* (lime.) It is alleged that the bark has the quality of fining the *mee-ra*, and of promoting the formation of the sugar or jagery. The quick-lime will no doubt absorb any acidity, and thereby tend to prevent fermentation. A good healthy spadix will yield from three to six English pints of sweet juice in 24 hours, namely, four pints in the morning, and two in the evening. The sweet juice is filtered immediately after it is drawn through *matulla*, and boiled over a slow fire in an earthen chatty on the same day it is collected. When the juice has been boiled for about two hours, a small quantity is taken out and tried. If it has been sufficiently boiled, it will form into a ball between the fingers, but if it do not cohere, the evaporation must be continued. When sufficiently boiled, it is poured into sections of coco-nut shells, in which it soon cools and becomes solid. Each loaf or cake of jagery is separately tied up in pieces of the dried leaf of the plantain tree (*Musa paradisaica*.) One gallon of *mee-ra* will yield about 24 ounces of jagery. The word jagery is probably a corruption of the Sanscrit word *Sakur*, sugar, and hence also the Arabic *shukar*, the Latin *saccharum*, the French *sucre*, and the English word sugar.

Uses of Jagery.—Jagery is almost the only sugar used by the indigenous inhabitants of Ceylon. In Java, and in some parts of the peninsula of India, it is converted into spirits by distillation. Cement or mortar mixed with water, which contains from 15 to 20 pounds of Jagery, dissolved in every 100 quarts, acquires great tenacity, and takes on a very fine polish. In Madras and some other parts of India the flat tops of the houses are covered with this cement. It is much employed to cover columns, as also to form the floors of rooms. Floors of this kind are sometimes stained so as to resemble marble. It is said that jagery cement has succeeded very well in Holland.

Trade in Jagery.—Ceylon exports a considerable quantity of this sugar, and I believe chiefly to the peninsula of India. In 1825 there were exported from this island 309,955 lbs. of jagery, the estimated value of which was L. 4946. By the regulations of 1813, the export duty levied upon jagery was 10 per cent. *ad valorem*.

MEDICAL USES.

Roots.—A decoction of the roots of this tree is considered by the native Doctors in India as a very useful remedy in intermittent fevers. Ginger and jagery are commonly added to the decoction, and the mixture is denominated a *cusement* by the Indo-Portuguese. When mixed with a little newly prepared oil, the decoction is much employed as a gargle.

Matulla (coco-nut tree lint.)—This soft downy cloth-like substance is used in India for stopping blood in cases of wounds, bruises, leech bites, &c. for which purpose the finer parts of it are well adapted. The Tamool name of this substance is *Panāday*.

Toddy.—Europeans, especially delicate females in India, who are apt to suffer much from constipation, find a cupful of fresh toddy drunk every morning at five o'clock, one of the simplest and best remedies they can employ. (*Ainslie, Materia Indica.*) Cæsar Frederick, who travelled in India as a merchant about the year 1563, avers, that toddy "has most excellent virtues, in so much that if a person were rotten with disease, and drinks abundantly of it, he shall become whole, as I have seen proved. For when I was in Cochin, the nose of a friend of mine began to drop off, on which he was advised by the physicians to drink toddy day and night as much as he was able. He did as he was directed, and I have seen him since perfectly sound, and well coloured." Now-a-days we have not such confidence in the virtues of toddy as to suppose that it would renovate a "rotten" nose.

Flowers.—The expressed juice of the flower mixed with new milk and sugar is much recommended as a demulcent. It is also said to be a useful remedy when mixed with fresh oil in local complaints.

Water.—The whey-like fluid or water of young coco-nuts is recommended by various authors to the fair sex as an excellent cosmetic.

Oil.—Coco-nut oil is used as a substitute for olive-oil, in the composition of pharmaceutical preparations, such as ointments, plasters, &c.

and it is found to succeed extremely well, except in the composition of plasters, where a union is required to take place between oil and the semi-vitreous oxide of lead. In the laboratory at Columbo it is employed in a number of the preparations where olive-oil is directed to be used by the pharmacopeias. It is alleged that coco-nut oil divides mercury better than any other oil.—(*Journal de Pharmacie*, Tom ii. p. 101.)

Ablution or frequent bathing of the body is a religious ceremony, which is rigidly observed by the disciples of every form of faith in India. A large portion of the natives of India bathe almost daily. After coming out of the water, the hair, and frequently all the body, is well rubbed over with coco-nut oil. Sometimes the oil is mixed with the powder of sandal-wood and other odoriferous substances. Coco-nut oil mixed with turmeric-powder is much employed by the natives of Ceylon and the South Sea Islands for anointing the body in wet weather and during sickness. Frequent inunction with coco-nut oil is alleged to be very useful in preventing diseases of the skin among persons who are often exposed to the ardent rays of a tropical sun and the aspersion of sea water.

The very great importance of the cultivation of the coco-nut tree in Ceylon may be inferred from the amount of duties levied on its produce, as will appear by the following statement :

Schedule of duties levied on the produce of the coco-nut plantations in Ceylon, average of three years, 1827, 28, 29.

Distillery of arack,	L. 3,644
Retail of do.	24,975
Export of do.	3,136
—— coir,	153
—— jagery,	162
—— copperas,	1,539
—— coco-nuts,	1,551
—— coco-nut oil,	413