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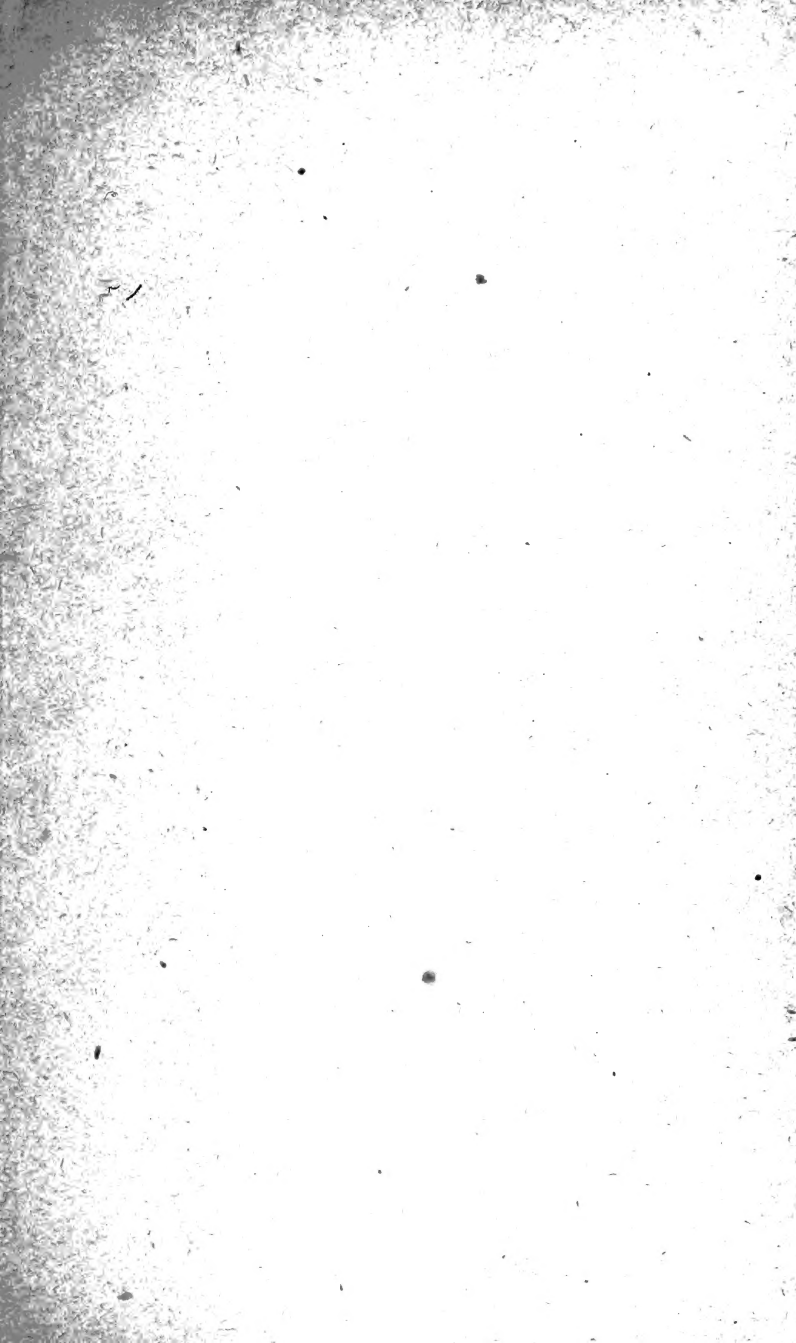
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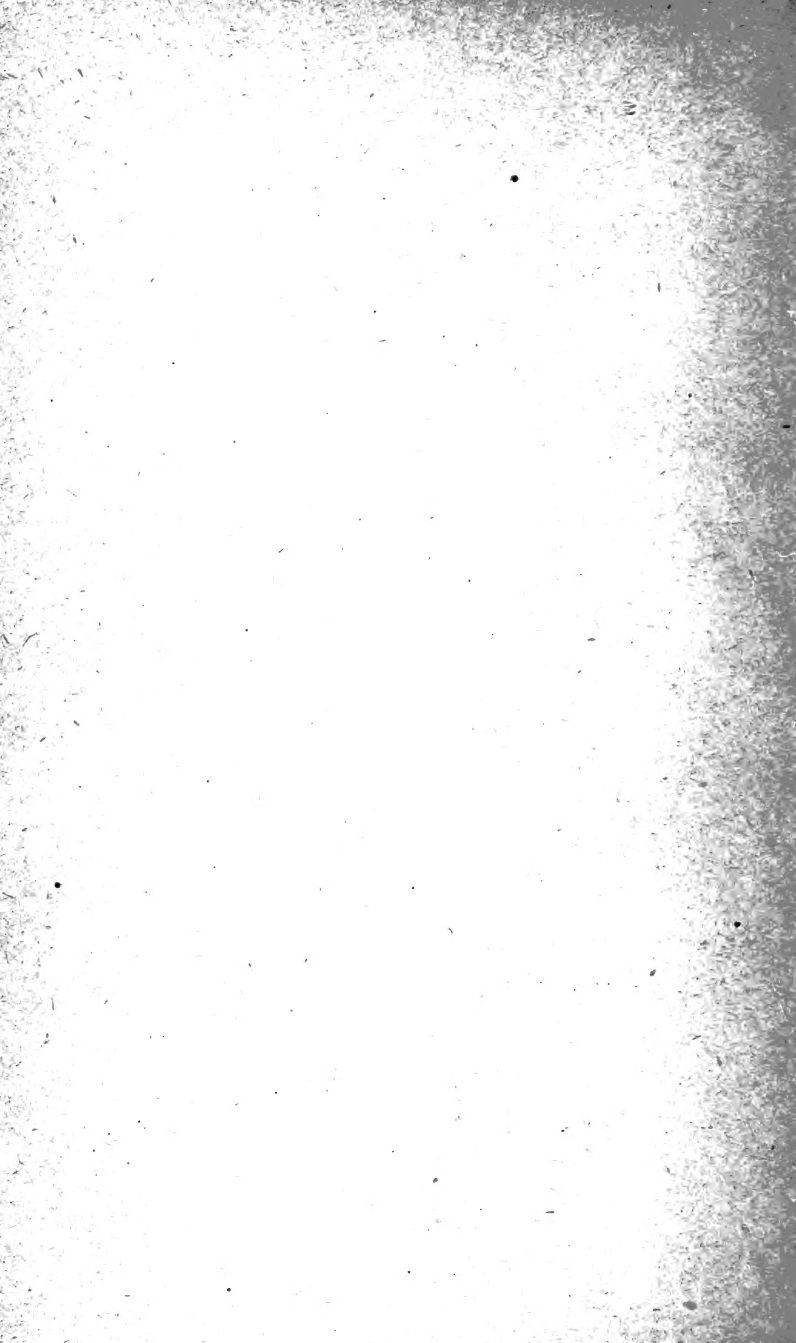




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ROYAL BOTANIC GARDENS, KEW.

OFFICIAL GUIDE

TO THE

MUSEUMS OF ECONOMIC BOTANY.

No. 1.

DICOTYLEDONS.

THIRD EDITION, REVISED AND AUGMENTED.



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# GUIDE

## TO THE

# MUSEUMS OF ECONOMIC BOTANY.

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THE collections occupy three separate buildings.

MUSEUM NO. I. overlooks the Ornamental Water, and is directly opposite to the Palm House.

MUSEUM NO. II. is at the northern end of the Herbaceous ground, three minutes walk from No. I.

MUSEUM NO. III., devoted chiefly to specimens of Timber and large articles unsuited for exhibition in the glazed cases of the other Museums, occupies the building formerly known as the *Orangery*, at the northern extremity of the Broad Walk leading to the Ornamental Water and Palm House. The Annexe contains the Gymnosperms.

### THE OBJECT OF THE MUSEUMS

is to show the practical applications of Botanical Science.

They teach us to appreciate the general relations of the Vegetable World to man. We learn from them the sources of the innumerable products furnished by the Vegetable Kingdom for our use and convenience, whether as articles of food, of construction and application in the arts, of medicine, or curiosity. They suggest new channels for our industry: they show us the variety in form and structure presented by plants, and are a means of direct instruction in most important branches of useful knowledge. We see from them the particular points upon which further information is needed, especially as to the origin of many valuable timbers, fibres, and drugs, in order to perfect our knowledge of economic botany; in brief, the Museums show us *how little*, as well as *how much*, we know of the extent to which herbs, shrubs, and trees contribute to our necessities, comforts, and numberless requirements.

## ORIGIN OF THE MUSEUMS.

The foundation and progress of these collections, not only by far the most extensive in existence, but the first of their kind established, may be briefly traced since the conception of their plan by the first Director of the Royal Gardens, Sir W. J. Hooker.

In 1847 the building now occupied by Museum No. II., which up to that year had been in use as a fruit store-house, &c., was added, by command of Her Majesty, to the Botanic Garden proper. Permission was immediately sought by the Director to have one room of this building fitted up with suitable cases for the exhibition of vegetable products,—objects which neither the living plants of the Garden nor the preserved specimens of the Herbarium could show. Sir W. J. Hooker's request was liberally met by the Chief Commissioner of Her Majesty's Woods and Forests, and the Museum was forthwith commenced; its nucleus consisting of the Director's private collection, presented by himself.

No sooner was the establishment and aim of the Museum generally made known than contributions to it poured in from all quarters of the globe, until, in a few years, the ten rooms of the building, with its passages and corners, were absolutely crammed with specimens. Its appreciation by the public being thus demonstrated, application was made to Parliament for a grant to defray the expense of an additional building for the proper accommodation of the objects, and the house occupied by Museum No. I., opened to the public in the spring of 1857, is the result.

In 1881 the extension of Museum No. I. on the west side, containing a new and commodious staircase, was erected at a cost of £2,000, met by a grant from the India Office, in order to supply the additional accommodation required from the Indian collections mentioned below.

From the Exhibitions of 1851 and 1862, and from the Paris Exhibitions of 1855 and 1867, large additions were made to the Museums, both by the presentation of specimens, and also by their purchase, aided by grants from the Treasury and Board of Trade. Many eminent firms engaged in the importation and manufacture of vegetable substances, have most liberally contributed

various illustrative series. By the different Government Departments, by our Colonial officers and foreign Representatives, and by numerous private travellers also, the most important services have been and continue to be rendered.

Besides these sources of contribution must be mentioned the reinforcement of the Indian element in the Museums, first in 1878 by the collection of forest produce, presented by the Government of India (consisting of 1,113 specimens), and secondly in 1880 by the transference to Kew of the entire Economico-botanical collections, forming part of the India Museum at South Kensington. From these about 4,000 specimens were selected for permanent exhibition; these are distinguished by a light blue label bearing the words India Museum.

On the staircase, at the first landing, has been placed the stained glass window in four lights, removed from the Guildhall, and presented to the Royal Gardens in 1878 by Alderman W. J. R. Cotton, M.P. It represents the growth and manufacture of cotton.

### THE ARRANGEMENT OF THE OBJECTS.

The specimens exhibited in Museums No. I. and No. II. are arranged in the order of what is termed the natural affinities of the plants which respectively furnish them. They are grouped under **NATURAL ORDERS**. These are, in some cases, very large, in others comparatively small. Some abound in economic products, while others afford but few.

Between the members of each Order the rule is, that a closer relationship subsists than with the members of any other Order. This relationship or affinity amongst plants is based upon the amount of similarity, chiefly in the form and arrangement of the parts of their flowers and seeds; and the correctness of this method is confirmed by a remarkable general and corresponding uniformity in the character of the products and properties of the plants thus brought together. For example, note the tough, fibrous **BARKS** of the "Nettle" Order, of the "Mezereon" Order, and of the "Linden" and "Mallow" Orders;—the **BITTER** or **TONIC** properties of the "Gentian" Order,

and of the "Quassia" and "Peruvian Bark" Orders;—the RESINS of the "Amyris" or "Frankincense" Order;—the NARCOTIC or POISONOUS character of the "Nightshade" Order, which includes the Deadly Nightshade, Henbane, and Tobacco.

In dividing the extensive arranged collections between the two Museum buildings, advantage has been taken of the two grand Classes under which the Orders of flowering plants are found to be grouped in nature. One of these great Classes occupies Museum No. I. The other Class, together with all the products, &c., yielded by those plants which are commonly regarded as *not* bearing flowers (as Ferns, Mosses, Seaweeds, Lichens, and Fungi), are contained in Museum No. II.

The same details of arrangement obtain through both Museums. The upright cases are numbered *outside*, above the glass doors: the numbers correspond to those on the margin of this Guide. The botanical name of each Natural Order is exhibited *inside*, at the top of the cases; also wherever an Order *begins*, if on a lower shelf. A brief note on each Order is given in this Guide, preceding the enumeration of the noteworthy objects belonging to it.

To simplify and facilitate reference, every object of great importance enumerated bears, upon a card, mounted *close by* it, a conspicuous corresponding number [*e.g.*, 26]. One numbering runs through the whole of each Museum.

The proportion of *numbered objects* to the whole is very small; this is a necessity which a handy guide-book, intended for visitors rather than students, imposes. As nearly every object is properly labelled, the deficiency is rather apparent than real. This Guide is not intended to supplant a system of copious instructional labelling, which is being constantly improved upon, and printed labels substituted for those written by hand. Any suggestion bearing upon these, or hints respecting our deficiencies, those who have the charge of this important branch of the Kew establishment will be most happy to receive. Such should be addressed in writing, to the Keeper of the Museums, or to the Director of the Royal Gardens.



MAPS are placed in the cases, showing in red colour the countries furnishing the products near which they are placed.

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## GUIDE TO MUSEUM No. I.

The chief botanical features which characterise the plants represented by their products or other specimens in this Museum, are these:—1. In their early condition, *while yet enclosed in the seed*, they nearly always have two (or sometimes more) little opposite lobes or leaflets (*cotyledons*: hence called *Dicotyledons*). 2. Those which form a woody stem, increase in thickness by a ring of new wood growing year by year on the *outside* of, and continuous with, the old. 3. The parts of the flowers are most frequently in *fives* or *fours*. 4. The small veins of the leaves are, commonly, *irregularly* netted.

The Collections occupy three Floors. The numbering begins upon the Top Floor, in the cabinet (No. 1) immediately round the corner to the left, on reaching the head of the stairs, and is continued on the left hand throughout the floor. The collections of the Middle and Bottom Floors follow the same order.

The collection of portraits of Botanists is partly hung on wall spaces in this Museum. The nucleus of it was formed by the late Sir W. J. Hooker, and after his death was purchased by the Government.

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### TOP FLOOR.

**Ranunculus Order** (*Ranunculaceae*). A family CASE  
1.  
widely spread, especially in cool climates. Few species have woody stems. Its general properties are acrid and poisonous. The Buttercup and Larkspur are common examples of the Order.

**No. 1.** Inner bark of TRAVELLER'S JOY (*Clematis Vitalba*, L.), used in Switzerland for straining whey from curd. The slender stems, peeled, are used for basket work, and in France to bind faggots, and their tips are sometimes pickled.

CASE 1. **No. 2. PILA-JARI, YELLOW ROOT** (*Thalictrum foliolosum*, DC.). Common throughout temperate Himalaya. Roots fibrous, about the thickness of a crow quill, externally dark brown, internally yellow. Tonic and aperient; used in India in mild intermittent fevers. Exported from Kumaon, under the name of MAMIRA.

**No. 3. BLACK HELLEBORE ROOTS** or **CHRISTMAS ROSE** (*Helleborus niger*, L.). A perennial herb of Central and Southern Europe. As seen in commerce it consists of the rhizome with rootlets attached. Cathartic and anthelmintic. Imported from Germany.

**No. 4. YELLOW** or **GOLDEN SEAL** or **YELLOW PUCCOON ROOTS** (*Hydrastis canadensis*, L.). A small perennial herb of North America, rhizome used as a tonic, aperient, and diuretic, also as a brilliant yellow dye.

**No. 5. COPTIS** or **MISHMEE TITA**. The small woody rhizome of *Coptis Teeta*, Wall. A native of the Mishmee Mountains in East Assam. Used in India as a pure bitter tonic.

**No. 6. GOLD THREAD**. Roots of *Coptis trifolia*, Salisb. A perennial, common in North America, where it is largely used as a pure bitter tonic.

**No. 7. FENNEL-FLOWER SEEDS** (*Nigella sativa*, L.). An annual, native of the Mediterranean Region. When fresh the seeds have an aromatic odour like fennel and a slightly acrid taste. Used as a spice by French cooks, and in the East for flavouring curries and other dishes; as a carminative and also to protect woollen goods against insects.

**No. 8. ACONITE, MONKSHOOD** or **WOLFSBANE** (*Aconitum Napellus*, L.). A perennial herb, with short fleshy rootstock, common throughout Europe, temperate and sub-arctic Asia and North America. The rootstocks are collected chiefly from wild plants, and used for medicinal purposes to allay pain or in rheumatic affections. It is a very virulent poison; deaths have occurred through mistaking Aconite-root for Horseradish. A little care,

however, might obviate this; the Aconite has a short dark-coloured tapering root, from which numerous rootlets are given off; the Horseradish is much longer, of more uniform thickness throughout, of a yellowish colour, and without root-fibres. The rootstocks of *Aconitum spicatum*, Stapf, and other species furnish the BISH poison of India, used for poisoning the arrows in tiger traps, &c. A tiger trap from the Sikkim Terai is exhibited. Note also sheep muzzle from Sikkim made of split Bamboo. When the shepherds take their flocks across districts where Aconite grows, they halt and a muzzle is made for each sheep to prevent its being poisoned.

CASE  
1.

**No. 9.** BLACK COHOSH, BLACK SNAKE ROOT, or BUGBANE (*Cimicifuga racemosa*, Nutt.). A perennial herb common in the United States and Canada. The rootstocks are bitter, slightly acrid and astringent, and are employed medicinally in North America.

**Magnolia Order** (*Magnoliaceae*), remarkable for its fine trees, bearing handsome flowers. Natives chiefly of the tropical and temperate Asiatic Mountains and of the United States.

**No. 10.** *Eucommia ulmoides*, Oliv. A small tree, native of China. The bark contains caoutchouc, and is a valued medicine of the Chinese.

Observe WINTER'S BARK, the aromatic bark of *Drimys Winteri*, Forst, a widely distributed South American tree. It takes its name from Capt. Winter, who commanded the "Elizabeth," under Sir Francis Drake, and who, on his return voyage from the Straits of Magellan in 1579, used the bark "as a spice and medicine for scurvy."

**No. 11.** STAR ANISE (*Illicium verum*, Hook f.). A small tree, native of China. The fruit is star-shaped, consists of several carpels, and is agreeably aromatic. It is imported from China into Europe, America, and India, for flavouring liqueurs and spirits, chiefly the Anisette de Bordeaux. Oil of Anise distilled from the fruit has aromatic, stimulant, and carminative properties. Its chief constituent is Anethol. *Illicium anisatum*, L., is the JAPANESE STAR ANISE, the fruits of which have a faint odour and taste of bay leaves, and are poisonous, fatal cases having arisen from the use of the oil.

**CASE No. 12. TULIP TREE** (*Liriodendron tulipifera*, L.).  
 2. A large tree of North America. Wood fine and even grained ; used in America for cabinet work, door panels, &c. Imported into this country in considerable quantities as WHITEWOOD or POPLAR for similar purposes. The inner bark is used under the name of YELLOW POPLAR BARK as a stimulant tonic.

**Custard Apple Order** (*Anonaceae*). Trees or shrubs, often climbing and aromatic, natives chiefly of the tropics of the Old World. Several afford excellent fruits.

**No. 13.** Wood of *Duguetia quitarensis*, Bth., a tree of South America, said to be one of the Lancewoods of coach-builders. Note also *Bocagea laurifolia*, B. & H., which affords WHITE LANCEWOOD, and *B. virgata*, B. & H., BLACK LANCEWOOD, shipped from the West Indies ; the two latter are the chief sources of supply.

Observe fruits of CALABASH NUTMEG (*Monodora grandiflora*, Bth.), a tree of West Tropical Africa. The seeds are aromatic, and used by the natives as a condiment.

**No. 14. CHERIMOYER** (*Anona Cherimolia*, Mill.). A delicious fruit, produced by a small tree of Ecuador and Peru, now widely distributed in sub-tropical countries.

**No. 15. SOUR SOP** (*Anona muricata*, L.). A small evergreen tree of Tropical America. The fruit is edible and has an acid flavour.

**No. 16. SWEET SOP** (*Anona squamosa*, L.). A low stunted tree of irregular growth, native of Tropical America. The leaves, seeds and immature fruits contain an acid principle destructive to insect life.

**No. 17. BULLOCK'S HEART or CUSTARD APPLE** (*Anona reticulata*, L.). A low spreading tree of Tropical America. The fruit is edible, and is employed medicinally as an anti-dysenteric and vermifuge.

Note also fruits of the ALLIGATOR APPLE (*Anona palustris*, L.), a low tree of Tropical America, found on marshy shores. The fruit, said to be narcotic and even poisonous is, however, greedily eaten by alligators ; the

wood known as CORK WOOD is employed for stopping casks and bottles, and for lining boxes. CASE  
2.

**No. 18.** AFRICAN, GUINEA or NEGRO PEPPER. Fruits of *Xylopia aethiopica*, A. Rich., a large tree of Upper Guinea. The black quill-like aromatic and pungent fruits are sold in the native markets for use as pepper and as a stimulant in medicine.

**Moonseed Order** (*Menispermaceae*). Climbing tropical shrubs, with bitter and narcotic properties. Observe the curious arrangement of the wood in cross section of stem and root. CASE  
3.

**No. 19.** PAREIRA BRAVA (*Chondodendron tomentosum*, R. & P.). A woody climber of Peru and Brazil. The root has a bitter taste, but no smell; used as a mild tonic and diuretic.

**No. 20.** GULANCHA (*Tinospora cordifolia*, Miers). A woody climber common in India and Ceylon. The roots and stems have bitter, tonic, antiperiodic, and diuretic properties.

**No. 21.** COCCULUS INDICUS (*Anamirta paniculata*, Colebr.). A large climbing shrub with corky bark, native of India. The fruits are kidney-shaped, about the size of a large pea. Imported into this country for the preparation of ointments and for the adulteration of beer.

**No. 22.** FALSE CALUMBA (*Cosciniun fenestratum*, Colebr.). A climber, native of the forests of Ceylon, Malacca, and Malabar. Wood bright greenish yellow, strongly marked in cross section by broad medullary rays. Said to have been long in use in Ceylon and Southern India as a tonic and yellow dye.

**No. 23.** CALUMBA or COLOMBO ROOT (*Jateorhiza Columba*, Miers). A perennial climber with short root-stock and numerous fleshy fusiform roots. It grows in the forests of Mozambique and Quillimane. Calumba root of commerce consists of the dried and sliced root. Shipped to this country either from Zanzibar direct, or by way of Bombay. It has a bitter taste and is a mild tonic.

**CASE**    **No. 24.** VELVET LEAF or SPURIOUS PAREIRA BRAVA  
 3. (*Cissampelos Pareira*, L.). A slender woody climber, cosmopolitan in warm regions. The root is a bitter tonic and diuretic but is not in use in European medicine.

**Barberry Order** (*Berberideae*). Shrubs and perennial herbs of temperate climates. Many have acid or astringent berries and bright yellow wood, which yields a dye.

**No. 25.** INDIAN BARBERRY (*Berberis Lycium*, Royle). A shrub, native of the Western Himalayas. The root bark is bitter and tonic, as are also those of *B. asiatica*, Roxb., and *B. aristata*, DC. Under the name of RUSOT, a watery extract prepared from the stem and root bark of various species is used in ophthalmia and as a tonic and febrifuge in India. In the bazaars the stem, extract and fruit are always obtainable.

**No. 26.** MAY APPLE or PODOPHYLLUM ROOTS (*Podophyllum peltatum*, L.). A perennial, common in moist woods in the United States and Canada. The rhizome and roots are collected about August, when the principle is most active, and thoroughly dried. They are slightly bitter and acrid, and furnish the medicine known as Podophyllin.

**Water Lily Order** (*Nymphaeaceae*). Herbs with floating leaves, found in various parts of the globe.

**No. 27.** Flower and leaf of VICTORIA WATER LILY (*Victoria regia*, Ldl.). A native of Guiana and Brazil, where the leaves sometimes measure 12 feet across, and the expanded flowers about one foot in diameter. The maximum size attained by leaves in this country is about 7 feet. The seeds are eaten by the Indians.

**No. 28.** EGYPTIAN LOTUS (*Nelumbium speciosum*, Willd.). Regarded by the early Egyptians, and by Buddhists and Hindus of the present day as an emblem of peculiar sanctity. Observe the seeds, or more properly fruits, imbedded in the dry top-shaped receptacle. They are imported into India from Persia in large quantities as an article of diet. The roots and scapes are used as food in India and China in times of scarcity.

**Side Saddle Order** (*Sarraceniaceae*). Chiefly bog herbs of North America, remarkable for the tubular form of their leaves. The powdered root of *Sarracenia purpurea*, L., has been recommended as a remedy in small-pox, but is valueless. CASE  
4.

**Poppy Order** (*Papaveraceae*). Principally herbs abounding in milky juice. Natives of temperate climates, especially of Europe. They are remarkable for their narcotic properties.

**No. 29.** Heads of the OPIUM or WHITE POPPY (*Papaver somniferum*, L.). Cultivated from early antiquity for the sake of its well-known dried juice known as OPIUM. Asia Minor, Egypt, Persia, and India yield the principal supply. The milky juice is obtained by incising the poppy-heads, from which it slowly exudes, turning to a brown colour. Its subsequent preparation varies in different countries. The instruments employed in the Indian Opium manufacture are exhibited in this case, and are separately marked by small numbered descriptive labels. The poppy heads (1) are scarified by little lancets (2) which are drawn from the bottom to the top of the "heads" (3); the juice is collected in small scoops (4), poured into plates or bowls (5, 6), from which part of the moisture drains off, and is carried to the factory in jars (7), where, after sampling by bamboo scoops (8), it is assorted, mixed with similar qualities in vats, and stirred by rakes (9), to insure uniformity. After sufficient exposure it is made up into cakes covered by petals of the poppy (14, 15), cemented together (18) with inferior opium. A chest divided into compartments for the Chinese opium trade is numbered 22. The balls of opium (23) are packed in "poppy trash" (24).

**No. 30.** Specimens of OPIUM from Smyrna, Egypt, Persia, and India; also specimens of the various alkaloids obtained from it. For medicinal purposes Indian opium is of much less value than that from Asia Minor or Persia, in consequence of its containing a much lower percentage of morphine.

**No. 31.** Complete OPIUM-SMOKING APPARATUS from China. Also carving in Pai'cha wood (*Euonymus*

**CASE 4.** *europaeus*, L., var. *hamiltonianus*) from Ningpo, illustrating the manner of smoking opium. For this purpose the opium is prepared in a liquid form; a drop about the size of a pea is roasted over the lamp and then placed over the little aperture in the bowl of the pipe; the smoker in a reclining posture keeps it alight by holding it over the flame.

The opium poppy is also cultivated in cool countries for the sake of the capsules and seeds, the former used in fomentations for allaying pain, the latter as an oil-seed (MAW-SEED). The residue of the seeds, after the oil has been expressed, forms an oil-cake for feeding cattle.

**CASE 5.** Observe petals of the COMMON RED or CORN POPPY (*Papaver Rhoeas*, L.). They have a somewhat unpleasant odour and slightly bitter taste. Used in medicine chiefly at a colouring agent. Observe also fruits, seeds, and oil of *Argemone mexicana*, L.

**NO. 32.** BLOOD ROOT or PUCCOON (*Sanguinaria canadensis*, L.). A perennial herb, with a fleshy root-stock of a dull red colour outside, and a bright red within. The plant has a wide distribution in Canada and the United States. It has a bitter acrid taste, and is stimulant and diaphoretic.

**Crucifer Order** (*Cruciferae*). Nearly all herbaceous, abounding in the temperate countries of the northern hemisphere. They are called Cruciferae (cross-bearing) from the four flower leaves (petals) being disposed, more or less distinctly, in the form of a cross, as in the Wall-flower, Cabbage, and Cress, familiar examples of the order. None are poisonous, but all are nitrogenous; they are often acrid, and occasionally antiscorbutic.

**NO. 33.** The so-called ROSE OF JERICHO (*Anastatica hierochuntica*, L.). An annual plant from the deserts of Arabia and Egypt. After withering, its spreading branches roll themselves up in a ball, and the whole plant is detached and blown about by the wind, the branches expanding again with the first rainfall. By this means the plant is readily dispersed.

**NO. 34.** HORSE-RADISH. The root-stock of *Cochlearia Armoracia*, L. A perennial herb, origin unknown,



naturalized in damp waste places through the greater part of Europe. It is largely grown in gardens for use as a condiment, as well as in medicine. CASE  
5.

**No. 35. MUSTARD.** The pulverised seeds of *Brassica alba*, Boiss., and *B. nigra*, Koch; the first, the White, the second, the Black Mustard. They are annuals found over a great part of Europe, the former being also found in Asia Minor, Algeria, and China; and the latter in Asia Minor, North-West India, and North Africa. In this country White Mustard is cultivated chiefly in Essex and Cambridgeshire, and Black Mustard in Lincolnshire and Yorkshire. Mustard of commerce, or Flour of Mustard, is usually prepared from the mixed seeds. Besides the use of Mustard as a condiment it is important as a stimulant and powerful rubefacient.

**No. 36.** A series of seeds of different forms (GUZERAT RAPE, etc.) of *Brassica campestris*, L., from various parts of India. Largely grown for expressing oil for food purposes.

Observe seeds and Oil of RAPE or COLZA (*Brassica campestris*, sub. sp. *Napus*, L.). Rape is grown in this country as a green fodder, and on the Continent for the oil expressed from the seeds. Used both for lamps and lubricating purposes.

**No. 37.** Models and drawings of SWEDE TURNIPS. The fleshy tuberous roots of *Brassica campestris*, sub. sp. *campestris*, extensively cultivated under many varieties for feeding cattle.

**No. 38.** COMMON TURNIP (*Brassica campestris*, sub. sp. *Rapa*, L.). A hardy perennial found in corn fields and similar places in this country. The root is hard and woody in the wild state but becomes succulent under cultivation.

**No. 39.** CABBAGE (*Brassica oleracea*, L.). In its wild state this is found on cliffs by the sea in several parts of England, but under cultivation it is well known in many forms as Brussels Sprouts, Savoy, Cauliflower, Kohlrabi, Broccoli, Red Cabbage, Scotch Kale, etc. CASE  
6.

**CASE 6.** **No. 40. CABBAGE WALKING STICKS**, the stems of a variety of the Garden Cabbage (*Brassica oleracea*, L.), grown in the Channel Islands. The growth in height is promoted by constantly stripping off the lower leaves.

**No. 41. WOAD**, a dye yielded by *Isatis tinctoria*, L., used by the ancient Britons to stain the skin blue. Its culture for this purpose was probably very general at a remote period. The manufacture of Woad in this country is rapidly dying out, and at the present time is carried on only in the neighbourhood of Wisbech. It is used in combination with indigo for dyeing purposes.

Observe seeds and models of varieties of **RADISH** (*Raphanus sativus*, L.).

**Caper Order** (*Capparideae*). Herbs or trees, frequently spiny. Many are found in hot and dry countries. The fruit is often curiously raised upon a distinct stalk above the scar of the withered flower.

**No. 42. CAPERS**, the flower buds of *Capparis spinosa*, L., a scrambling bush of the Mediterranean region. It is largely cultivated in Spain, France, Italy, Algeria and Sicily, the Capers being shipped in casks chiefly from Marseilles and Bordeaux. The flower buds of *Zygophyllum Fabago*, L., are occasionally substituted.

Note fruits of *Capparis Mitchellii*, Lindl., the **QUEENSLAND POMEGRANATE**, a shrub with large white flowers. The fruits are one to two inches in diameter with a rough exterior rind; the pulp, which has an agreeable perfume, is eaten by the natives. Observe also fruits of *Capparis oleoides*, Burch., a South African plant introduced into America about 1867 under the name of **FRUCTUS SIMULO** as a remedy for epilepsy.

**Cistus Order** (*Cistineae*). A small order of plants abounding in Spain, Portugal, and N.W. Africa, represented by the Rock Roses and Gum Cistus of our gardens.

**No. 43. LABDANUM**. A resin exuded by the leaves and branches of *Cistus polymorphus*, Willk., and other species of the Levant, largely used as a medicine during the prevalence of the plague. At the present day it is chiefly employed by the Turks in perfumery. It is

collected by whipping the plants with an instrument called a LADANISTERION, which consists of long thongs attached to a rake-like frame, the resin adhering to the straps. Two of these instruments are exhibited, one from Crete and the other from Cyprus. CASE  
6.

Note in passing, under the Order *Resedaceae*, dried specimens of WELD or DYER'S WEED (*Reseda Luteola*, L.), a common British wayside plant largely used at one time as a yellow dye. Also the Violet Order (*Violarieae*), the roots of several species of which possess emetic or purgative properties, especially those of *Ionidium Ipecacuanha*, Vent., which furnishes some of the FALSE IPECACUANHA that occasionally finds its way into the English drug market. Its root can however be readily distinguished by being marked with fine longitudinal lines and not annulated as in the true drug. The roots of other species of *Ionidium*, viz.—*I. glutinosum*, Vent., and *I. heterophyllum*, Vent., are also occasionally substituted. All these species are natives of Brazil.

**Canella Bark Order** (*Canellaceae*). A small group of trees or shrubs, with aromatic bark, natives of the West Indies and tropical America.

**No. 44. CANELLA BARK** (*Canella alba*, Murr.). An evergreen tree 30 to 40 feet in height, native of the West Indies and South Florida. The bark is imported from Nassau in New Providence in quills of irregular length. It is orange or buff coloured externally, and yellowish white internally. It has a bitter, acrid, and pungent taste, and an agreeable odour resembling Cinnamon. It is used in the West Indies as a condiment, and in this country occasionally as an aromatic stimulant. Note also bark of RED CANELLA or MOUNTAIN CINNAMON (*Cinnamodendron corticosum*, Miers). Native of the West Indies. It has an aromatic odour and was formerly used as a substitute for Winter's Bark, which *see*.

**Annatto Order** (*Bixineae*). Shrubs or trees of the hottest parts of the globe.

Note specimens of KUTEERA GUM of the Indian bazaars, furnished by *Cochlospermum Gossypium*, DC., used in the United Provinces as a substitute for Traga-

**CASE** canth. The name Kuteera is applied in India to other  
 6. light-coloured gums, such as those from species of *Sterculia* and *Astragalus*.

**No. 45.** ANNATTO, an orange or yellow dye for silks and staining cheese, prepared from the red-coloured pulp which covers the seeds of *Bixa Orellana*, L., a small bushy tree with handsome white or pinkish flowers, widely distributed in the tropics. Both the prepared dye and the seeds are imported, chiefly from South America and the West Indies. Dried specimens of the plant are shown with the red seeds attached to the inside of the fruit capsules.

**CASE** Observe snuff boxes and ornaments, made of the round  
 7. fruits of *Oncoba spinosa*, Forsk., by the native tribes of Natal.

**No. 46.** KEI APPLES (*Aberia Caffra*, Harv. & Sond.), the fruits of a shrub, native of the Cape of Good Hope and Kaffirland, which when fresh, are acid and used as a pickle, and when ripe are made into a preserve.

**No. 47.** CHAULMUGRA OIL, from the seeds of *Tarakogenos Kurzii*, King, a tree of the forests of Sylhet, Chittagong and Burma. It is used in India for the treatment of skin diseases and dysentery and is also employed medicinally in this country.

Note LUKRABO SEEDS, the produce of *Hydnocarpus anthelminticus*, Pierre. They are exported in considerable quantities from Siam and Cochin China to China, where, under the name of TA-FUNG-TSZE, they are in repute in the treatment of various skin diseases.

**Pittosporum Order** (*Pittosporaceae*). A small group of shrubs and trees confined to the Old World. They are chiefly Australian and Polynesian.

**No. 48.** Wood of *Pittosporum bicolor*, Hook., and *P. undulatum*, Vent., from New South Wales and Tasmania. They are close grained and adapted for turning and wood engraving.

**Milkwort Order** (*Polygaleae*). Characterised by a bitter principle.

**No. 49.** SENEGA or SNAKE ROOT (*Polygala Senega*, L.). A perennial herb of the United States. The root has a distinctive odour and sweetish taste, changing to a sourish acid. Used against chronic bronchitis, asthma, rheumatism, &c. CASE  
7.

Near this note MALOUKANG, MALUKU, ANKALAKI, or BLACK BENI SEEDS (*Polygala butyracea*, Heckel), occasionally imported from West Africa as oil-seeds. The oil is said to be of "excellent quality and of very agreeable taste." Note also BUAZE FIBRE and nets made of the fibre of *Securidaca longepedunculata*, Fres., a branching shrub of Eastern Tropical Africa.

Observe also SWAN RIVER BROOM (*Comesperma scoparium*, Drum.). From a small knotty rootstock a quantity of slender twiggy branches arise, the whole forming a natural broom, which has only to be cut to be ready for use.

**No. 50.** RHATANY ROOT (*Krameria argentea*, Mart.). Imported from Para. The bark is a powerful astringent and tonic, employed in diarrhoea and dysentery. *K. triandra*, Ruiz. and Pav., is the source of Peruvian Rhatany and *K. Ixina*, L., that known as Savanilla, or New Granada Rhatany.

**Chickweed Order** (*Caryophylleae*), to which the Pink, Carnation, and Catchfly belong. Chiefly herbs inhabiting cold and temperate regions. A saponaceous principle pervades many of the species, as *Saponaria officinalis*, L., *Gypsophila Struthium*, L., *G. Arrostii*, Guss., and *G. paniculata*, L. The roots of the three last named are used for washing silks and other delicate fabrics. The Italian soap-root appears to be derived from *G. Arrostii*; that of Asia Minor from *G. paniculata*.

**No. 51.** Tufts of *Arenaria musciformis*, Wall., and *Thylacospermum rupifragum*, Schrenk, from exposed rocks 14,000 to 18,000 feet above sea-level in the Himalaya. CASE  
8.

**Purslane Order** (*Portulacaceae*). Succulent herbs or small shrubs, found chiefly in dry arid places in South America and at the Cape. Some are of value as pot-herbs, as *Portulaca oleracea*, L.

**CASE No. 52. SPÆTLUM ROOT (*Lewisia rediviva*, Pursh).**

8. The roots are collected as food by the Indians of the Upper Oregon territory. They retain their vitality for a long time.

**Tamarix Order (*Tamariscineae*).** Bushes or small trees, widely distributed. Several species produce galls, notably *Tamarix articulata*, Vahl. Abundant in Sind and the Punjab, and distributed in Baluchistan and westward to Egypt and South Africa. *T. gallica*, L., is common in India, Burma, and Ceylon, also Europe and Tropical Africa. TAMARIX GALLS are used in medicine as an astringent, and are also employed for dyeing.

**Tutsan Order, or St. John's Worts (*Hypericineae*).** Plants with opposite undivided leaves, often dotted with minute oil glands, easily seen when held against the light. A few are used in medicine, as *Hypericum perforatum*, L.

**Gamboge Order (*Guttiferae*).** Tropical trees and shrubs, with entire, opposite, smooth, and rather thick leaves. Many of the representatives of the order afford valuable oil-seeds and a yellow, purgative, resinous juice which in some Eastern species is collected as Gamboge, the well-known pigment and medicine.

**No. 53. KARAMANI RESIN (*Symphonia globulifera*, L.).** A tree of British Guiana. The resin is chiefly collected by the negroes from among the roots of old trees. It is used in medicine and as a cement for fixing arrow- and spear-heads. In Jamaica it is called Hog Gum.

**No. 54. Fruit of the BUTTER or TALLOW TREE of SIERRA LEONE (*Pentadesma butyracea*, Sabine).** When cut these fruits yield a greasy yellow juice which becomes solid on exposure to the air. It is mixed by the negroes with their food.

**No. 55. Portion of trunk of the "TONG RONG" or GAMBOGE TREE of SIAM (*Garcinia Hanburyi*, Hook. f.),** spirally gashed to cause the resin to flow into joints of Bamboo placed to receive it. Note also samples of Siam Gamboge which forms the bulk of the Gamboge of commerce.

**No. 56.** BITTER or MALE KOLA of TROPICAL AFRICA **CASE**  
*(Garcinia Kola, Heckel)*. The seeds are reputed to have **8.**  
 similar properties to those of the common Kola (see  
 No. 76).

**No. 57.** Fruits of *Garcinia indica*, Choisy, a small  
 Indian tree. The fruit is similar in appearance to a small  
 apple, and has an acid flavour. From the seeds a solid  
 oil is obtained which is known as KOKUM BUTTER, used  
 in India in the preparation of ointments, &c.

**No. 58.** Bark and young wood of the CEYLON GAM-  
 BOGE TREE (*Garcinia Morella, Desr.*), showing the  
 coloured juice which has exuded and dried upon the  
 cut edge. Ceylon Gamboge is obtained by making  
 incisions in the bark, or by cutting out pieces of it; the  
 juice oozing from the wounds hardens on exposure, and  
 is scraped off.

Various samples of Gamboge obtained from different  
 species of *Garcinia* in India are shown.

**No. 59.** MANGOSTEEN. Fruits of *Garcinia Mango-*  
*stana, L.*, a moderate-sized tree of Malacca and the Malay  
 Archipelago introduced into Ceylon and the West Indies.  
 The fruits are about the size and shape of a small apple,  
 reddish brown when ripe. The juicy white pulp sur-  
 rounding the seeds is eaten, and has a refreshing delicate  
 flavour; it is considered by some the choicest of all  
 tropical fruits.

Note flower-buds of *Ochrocarpus longifolius*, Benth. **CASE**  
 and Hook. f., used in India, under the name of SURINGI, **9.**  
 for dyeing silk a yellow, or deep orange colour; they are  
 also employed in medicine. Note also fruits of the  
 AFRICAN MAMMEE APPLE (*Ochrocarpus africanus*,  
 Oliv.), from Sierra Leone and the Niger.

On the lower shelves are shown fruits and woods of  
 several species of *Calophyllum*, including the ALEXAN-  
 DRIAN LAUREL (*C. Inophyllum, L.*), from the fresh  
 seeds of which a fragrant green oil is obtained, in India  
 known as PINNAY or DOMBA oil. Used for burning in  
 lamps, and externally as a medicine in the treatment of  
 rheumatism. The seeds of GALBA (*C. Calaba, Jacq.*),  
 KEENA (*C. tomentosum, Wight*), and NAGESAR (*Mesua*

CASE 9. *ferrea*, L.), all contain oil; all three species yield strong and durable woods.

On the bottom shelf are fruits of the MAMMEE APPLE (*Mammea americana*, L.), a large West Indian tree. The fleshy part of the large russet brown fruit is sweet and aromatic and is used for making preserves. A liqueur is prepared from the flowers, and the gum is used to destroy the Chigoes (*Culex penetrans*) in the feet of negroes.

Observe two necklaces made of the remarkable velvet-like seeds of *Quina jamaicensis*, Gris., from Jamaica, and *Q. guianensis*, Aubl., from British Guiana. Also fruits of *Touroulia Jenmani*, Oliv., of British Guiana, and a necklace made of the seeds which are similar to those of *Quina* in their velvety appearance, but larger and of a darker colour.

CASE 10. **Tea Order** (*Ternstroemiaceae*). Trees and shrubs, chiefly South American and East Asiatic.

No. 60. SOUARI NUTS, the fruits of *Caryocar nuciferum*, L., and *C. tomentosum*, Willd. The kernel is said to be the most delicious of the nut kind. It contains a sweet oil, used in South America. The timber of *C. tomentosum* is valuable for shipbuilding.

On a lower shelf observe specimens of the wood of the MURA PIRANGA (*Haploclathra paniculata*, Bth.), from Brazil. The wood is extremely hard and close grained and is used by the people for making walking sticks, spears, &c. In the upper part of the case is a MURUCU or STAFF made of this wood and used by the Tuchauas or chiefs of the Uaupe Indians.

Note also wood, seeds, and oil of *Camellia Sasanqua*, Thb., a native of China and Japan, where the oil is used for a variety of domestic purposes. The dried leaves are fragrant, and are said to be used to mix with tea.

The most important member of the order is the TEA PLANT (*Camellia Thea*, Link.). It is a native of Assam, and probably also of China, though in the latter country, so famed for its production, it is only known under cultivation. Black and green teas are prepared from the same plant by peculiar methods of drying or curing; the leaves made up into *green* being more rapidly dried



and not permitted to remain in a moist and flaccid state so long as those intended for *black* tea. Tea is largely produced in India, Ceylon, China, Japan and Java, and to a less extent in Formosa, the Caucasus, Natal, &c. The total imports of tea into the United Kingdom for 1905 amounted to 309,601,776 lbs., of this quantity 259,088,591 lbs. were entered for home consumption. In the last division of this case note examples of Chinese Tea-root carvings from Amoy.

CASE  
10.

**No. 61.** A box of ingredients used in China for the artificial colouring of the lower grades of green tea.

**No. 62.** BRICK TEA of Tibet, pressed and dried in moulds. It is largely used in Central Asia boiled with salt, butter, &c. In the table case at the head of the stairs near Case No. 1 are various articles employed by Tibetans in the preparation of this tea for consumption. Observe in the tea case "wheatsheaf," "lozenge" and other forms of fancy teas. Upon the adjoining wall are hung Chinese drawings on rice paper, illustrating the history of the tea plant from its first introduction in fabulous times to human notice by a monkey, to the packing and exportation of the present period.

**Wood-Oil Order** (*Dipterocarpeae*). A small group of gigantic forest trees of India, Burma and Ceylon, valuable as timber trees, and for the most part abounding in resin and wood-oil. They have characteristic winged fruits, of which various forms are shown.

CASE  
11.

**No. 63.** GARJAN or KANYIN OIL, obtained chiefly from *Dipterocarpus turbinatus*, Gaertn. A lofty evergreen tree of India, Burma, and the Andaman Islands. Large quantities of the wood-oil are collected in the Chittagong forests and exported to Calcutta. To extract the oil deep incisions are made in the trunk about 3 to 5 feet from the root and fire is applied to cause the oil to exude. It is used in medicine in India as a substitute for balsam of copaiba; also as a varnish for preserving timber. The oleo-resin known as IN or ENG OIL is obtained by a similar process from *D. tuberculatus*, Roxb., a large deciduous tree of Burma; this is used for

**CASE** water-proofing and for torches. Note torches filled with  
 11. the resin of *D. alatus*, Roxb., covered with leaves of species of *Pandanus*.

**No. 64.** Log of SUMATRA CAMPHOR TREE (*Dryobalanops aromatica*, Gaertn.). The crystallized camphor is shown *in situ* on the wood. It does not reach Europe, but is an important article of commerce with China and Japan, the people of those countries attributing to it extraordinary virtues and paying a high price for it, in preference to ordinary camphor, their own produce. Specimens of Sumatra Camphor-Oil are also exhibited.

**No. 65.** Fine mass of resin from *Vateria acuminata*, Heyne, a handsome tree of the moist low country of Ceylon, where the wood is used for coffins and minor purposes. *Vateria indica*, L., yields PINEY RESIN INDIAN COPAL, or WHITE DAMMAR, used in varnish on the Malabar coast. Piney tallow, used for candles, is obtained by roasting, grinding and boiling the seeds.

**No. 66.** Wood of the SÁL or SAUL TREE (*Shorea robusta*, Gaertn.). A large timber tree widely distributed in India, and forming extensive forests. The wood when thoroughly seasoned is of great strength, elasticity and durability, and is used for piles, beams, railway sleepers, gun carriages, &c. By tapping, the tree yields large quantities of a whitish transparent resin or dammar, used for caulking boats and as incense. The seeds are eaten in times of scarcity and also yield a hard white oil used for cooking and lighting. Other species of *Shorea* and *Hopea* afford valuable timbers.

On bottom shelf observe DAMMAR HOLDER from Perak. It is used in the same way as a candlestick and is made to support two cylindrical torches made of the spathe of *Areca Catechu*, filled with a Dipterocarpeous resin.

**CASE** **Mallow Order** (*Malvaceae*). A large order most  
 12. numerous in the tropics, diminishing in numbers towards the poles. Remarkably destitute of all noxious properties; but mucilaginous and affording from the inner layers of the bark a useful fibre. The pink mallows of our roadsides represent the order in Britain.

**TRIBE I. Malveae.** Observe **MARSH MALLOW ROOT** (*Althaea officinalis*, L.), which yields the Guimauve of French pharmacy. Note also fibres from *Sida rhombifolia*, L., East Indies; *S. paniculata*, L., Botanic Garden, Mauritius; *Abutilon indicum*, Sweet, East Indies; and *A. Avicennae* the source of Jute or Hemp of Northern China.

**TRIBE II. Ureneae.** Note fibres furnished by species of *Malachra*, *Urena*, and *Malvaviscus*.

**TRIBE III. Hibisceae.**

**No. 67. ROZELLE or RED SORREL** (*Hibiscus Sabdariffa*, L.). An annual, widely cultivated in tropical countries for the fleshy calyx which is used for the preparation of cooling refreshing drinks, preserves, &c. The stems yield a strong silky fibre known as Rozelle Hemp, and the seeds afford excellent food for cattle. Note also *H. cannabinus*, L. An annual or perennial, cultivated throughout India and in most tropical countries as a fibre plant. It is the source of **DECCAN** and **AMBARI HEMP** and also of the fibre known as **KANAFF** produced on the shores of the Caspian. Other species of *Hibiscus* afford useful fibres.

**No. 68. OKRO or GOMBO** (*Hibiscus esculentus*, L.). A large annual herb reaching five or six feet in height, largely cultivated in tropical countries as also in the Mediterranean region, for the sake of the fruits, which vary in length from three to eight inches, and are used in a green state as an article of food and for thickening soups. Gombo soup is a characteristic dish of the Southern United States. The roasted seeds have been used as a substitute for coffee.

Observe **MUSK SEEDS** (*Hibiscus Abelmoschus*, L.), cultivated in most tropical countries. The seeds are used for imparting a musky odour to sachets and hair-powder. They are occasionally imported into this country.

**No. 69. CUBA BAST**, the inner bark of the **MAHOE** (*Hibiscus elatus*, Sw.), a West Indian tree, formerly used for tying plants in gardens, as well as for tying up bundles of cigars. It is also utilized, after bleaching or

CASE 12. dyeing, for making ladies' hats. The wood is very flexible and durable and is used for fishing-rods, gunstocks, &c.

CASE 13. In this case note flowers, fruits, gum, and fibre of the PORTIA TREE (*Thespesia populnea*, Corr.), a coast tree of India, Ceylon, the Pacific Islands, &c. The fibre from the inner bark is said to be used in Demerara for making coffee bags. The wood is tough and durable and is used in India for furniture, cart and carriage building, gunstocks, &c.

**No. 70.** COTTON consists of the delicate, tubular, hair-like cells which clothe the seeds of various species of *Gossypium*; its commercial value depends on the length and tenacity of these hairs.

The species yielding the cottons of commerce are, (1) Sea Island Cotton (*G. vitifolium*, Lamk., and possibly also *G. barbadense*, L.); (2) Short Staple American (*G. herbaceum*, L.); (3) Upland, Georgian, and Egyptian (*G. hirsutum*, L. Sp. Pl. non Herb.); (4) Indian—(a) Surat, Broach, &c. (*G. obtusifolium*, Roxb., of which there are many varieties, the best being *G. wightianum*, Tod.), and (b) Bengals (*G. neglectum*, Tod.); (5) Brazilian, Bahia and Pernambuco (*G. brasiliense*, Macf.); (6) Peruvian (*G. peruvianum*, Cav.); (7) China and Japan (*G. Nanking*, Meyen).

The name Nankin Cotton came into use to denote any khaki-coloured cotton. All wild cottons have rufous floss and every cultivated plant by reversion tends to produce red-coloured cotton so that any species may afford a Nankin cotton if by Nankin be meant a rufous or khaki-coloured floss.

A portion of this case is devoted to the different sorts of commercial cotton, grown in the United States, South America, India, Africa, and the warmer parts of Europe; also to specimens of cotton cloths in various stages of manufacture both by civilised and barbarous nations.

The use of Cotton dates from a very early period. Sanscrit records carry it back at least 2,600 years, while in Peruvian sepulchres cotton cloth and seeds have been found. No. 71 is a piece of cotton cloth from a Peruvian mummy.

Exhibited in this case is a tinder box and matches with tinder of burnt cotton rag. Such were in universal use throughout England before the invention of lucifers. CASE  
13.

A cotton plant from Georgia, mounted specimens of cotton pods from China, Assam, Brazil and Cuba, and a collection of Indian Cotton in various stages of manufacture are shown in special cases near Case 5.

The total imports of raw cotton into the United Kingdom in 1905 amounted to 19,674,957 cwts.

**No. 72.** Oil from cotton seeds, used extensively as a substitute for Olive Oil, for soap-making, and oil-cake for feeding cattle. The imports of cotton seed into the United Kingdom in 1905 amounted to 568,928 tons.

**TRIBE IV. *Bombaceae*.** **SILK COTTON TREES.** These are nearly all tropical, some being of immense size, as the **BAOBAB, MONKEY BREAD** or **MONKEY TAMARIND** (*Adansonia digitata*, L.), native of Tropical Africa, cultivated in India and Ceylon. The bark has been introduced for making paper of which specimens are exhibited. Note also cloth prepared by beating out the inner bark of the tree.

**No. 73.** Wood of the **BAOBAB**, together with fine specimens of the gourd-like fruits which contain an edible acid pulp. The fruits are used in India as floats for fishing nets and bottles for holding water. Trunks have been measured 30 feet in diameter. The wood is light, soft, and of little use.

*Adansonia Gregorii*, F. Muell., is the **AUSTRALIAN BAOBAB** or **GOUTY STEM TREE**. To the aborigines it is probably the most useful tree in 'Tropical Australia; the pulp of the fruit is eaten both without preparation and after grinding and moistening. The kernels are slightly baked.

Observe **SILK COTTON** or **SEMUL**, the silky covering of the seeds of *Bombax malabaricum*, DC., a large soft-wooded tree of India, Burma, Java, &c. The wood is used for toys, scabbards, tea boxes, &c., but is not durable. Ropes are made from the fibrous bark and a gum called **MUCHERUS**, employed in India in medicine, exudes from the tree when the bark has been injured by decay or insects. The Silk Cotton is used for stuffing cushions.

**CASE 13.** **No. 74.** **KAPOK TREE** (*Eriodendron anfractuosum*, DC.), of the tropics of the old and new worlds. The Silk Cotton surrounding the seeds is more valued than that obtained from Bombax, and is exported in large quantities from Java to Europe and Australia for stuffing mattresses and for the manufacture of life-saving apparatus. The seeds are also exported to Europe as oil-seeds.

The **CORK** or **WOOL TREE** of the West Indies (*Ochroma Lagopus*, Sw.), yields a Silk Cotton of no commercial value.

Note nest of the "Doctor Humming-bird" formed of this substance.

**No. 75.** **DURIAN FRUITS** (*Durio Zibethinus*, Murr.). A tree cultivated in Malacca and the Malay Islands. By those who have overcome its civet odour and turpentine flavour, it is considered one of the most delicious of fruits.

Note fruits of *Neesia altissima*, Blume, from Penang, and the flower of the **HAND PLANT** (*Cheirostemon platanoides*, Humb. and Bonp.). Venerated by the ancient Mexicans on account of the singular resemblance to a clawed hand presented by the curved stamens of the flower.

**Sterculia Order** (*Sterculiaceae*). These resemble in many points of structure and in their qualities the Mallow tribe.

Several species of *Sterculia*, natives of the East and West Indies, Ceylon, Australia, Tropical Africa, &c., yield fibrous barks, from which ropes are made. A light coloured semi-transparent gum, like Tragacanth, is also furnished by many of them. That from *Sterculia urens*, Roxb., is used medicinally in India as a substitute for Tragacanth and also for making sweetmeats, and is known as **KUTEERA GUM** (See *Cochlospermum Gossypium*, p. 17).

**CASE 14.** On an upper shelf of the first compartment of this case observe fruits of **BOA-TAM-PAIJANG** of the Siamese (*Sterculia scaphigera*, Wall.), remarkable for the mucilaginous character of their pericarps when immersed in water. They contain nearly 60 per cent. of Bassorin, and are used by the people of Siam and China for making a mucilaginous drink as well as for making jellies which are eaten as a delicacy.

**No. 76. COLA OR KOLA NUTS** (*Cola acuminata*, Schott and Endl.), the seeds of a small tree, native of West Tropical Africa, naturalized in the West Indies. Powdered cola nuts thrown into fowl water are said to possess the virtue of clarifying it and rendering it agreeable to the taste. They are chiefly used, however, to satisfy the craving of hunger and enable those who eat them to endure prolonged labour without fatigue. The Cola seed or "nut" is highly esteemed by the natives of Tropical Africa and enters largely into the social and dietetic economy of their daily life. Cola paste, similar to chocolate, is prepared from the ground seeds which contain about 2 per cent. of caffeine.

**No. 77. COCOA OR CHOCOLATE** (*Theobroma Cacao*, L.). A small tree of Central and South America, cultivated to a large extent throughout the tropics of both hemispheres, particularly in the West Indies, the chief places being Trinidad, Venezuela, and Grenada, and latterly Ceylon, Jamaica and Lagos. There are numerous well-marked varieties divided into two groups known in the West Indies as FORASTERO and CRIOLLO Cacao. The fruit contains many seeds closely packed in pulp. These after being removed from the pods are fermented and rubbed (or in some cases washed) and afterwards carefully dried in the sun. The cocoa or chocolate of shops is prepared by roasting the seeds which are afterwards ground between hot cylinders to a paste (for chocolate) or mixed with sugar, starch, &c. (for cocoa). COCOA NIBS consist of the seeds merely broken. OIL of THEOBROMA or CACAO BUTTER is expressed from the seeds and used medicinally. A collection of specimens of Cocoa from various countries, with its different preparations, presented by Messrs. Fry & Sons, is here exhibited. In 1905, 54,565,589 lbs. of raw cocoa were imported into the United Kingdom, 46,496,174 lbs. being entered for home consumption.

*Theobroma speciosa*, Willd. is cultivated in Guatemala. It is the TABASCO CACAO of the Atlantic slopes of Central America, and probably identical with the celebrated SOCUNUSCO CACAO of the Pacific slopes. The latter is supposed to be the best Cacao known, and little, if any, finds its way into foreign markets.

CASE 15. No. 78. Flowering and fruiting branch and root of *Glossostemon Bruguieri*, Desf. The latter is sold in Egyptian bazaars under the name of MOGHAT for use with other ingredients in the preparation of Moghat powder employed by Coptic and Arabian women as a strengthening medicine.

Illustrations of the fibrous character of many Indian species of the order are exhibited in this case, including *Abroma augusta*, L., the DEVIL'S COTTON. The fibre is strong, white and is chiefly employed for cordage. Note also BASTARD CEDAR (*Guazuma tomentosa*, H. B. and K.), this also affords a strong fibre, but is chiefly regarded as useful on account of the foliage and fruit which are used in the West Indies as food for stock.

**Linden Order** (*Tiliaceae*), to which belongs our Lime or Linden tree. The inner bark or bast of some furnish very valuable fibres, specimens of which, belonging to several species of *Grewia*, *Triumfetta*, &c., are exhibited.

No. 79. JUTE or GUNNY FIBRE obtained from *Corchorus capsularis*, L., and *C. olitorius*, L., used for making rice and sugar bags in India. It is an article of large and increasing importation into this country, being used in the manufacture of carpets, and other fabrics. Specimens of Jute in various stages of manufacture are shown, including carpets and printed tapestry.

No. 80. Bast from the common LIME (*Tilia vulgaris*, Hayne), usually prepared in Russia, hence the name "Russia matting." The wood of the Lime though close grained is easily worked, and is pre-eminently a carver's wood. The wood carvings of Gibbons, executed in the time of Charles II., are in Linden wood.

CASE 16. Note BASSWOOD (*Tilia americana*, L.), imported from North America for cheap furniture, carriage building, turnery, &c. It is not strong, but is easily worked.

No. 81. MACQUI BERRIES (*Aristotelia Maqui*, L'Hérit.). A small evergreen tree of Chili. The fruits are eaten either fresh or preserved, and are exported to Europe for colouring wines. The leaves are used medicinally.

CASE 17. Note in this case examples of the use of the stones of species of *Elaeocarpus*, especially *E. Ganitrus*, Roxb.,



India (which are made into rosaries by Brahmins), and **CASE**  
*E. grandis*, F. Muell., of Australia. **17.**

**Flax Order** (*Lineae*). A small order of trees, shrubs, or annual herbs, with showy, fugitive flowers, characterised by the tenacious fibre of the inner bark. The most important species is the common **FLAX** (*Linum usitatissimum*, L.), specimens and products of which are exhibited in this case. Note a series of mounted specimens of fruits and seeds from the screenings of imported Linseed.

**No. 82.** **LINSEED**, the seeds of the Flax plant, from Russia, Sicily, Egypt, India, and America. The husk, or *testa* of the seed, abounds in mucilage, which is set free in water. Largely used for the expression of Linseed oil, the residue being—

**No. 83.** **OIL-CAKE** for cattle-feeding.

**No. 84.** **WHITE LINSEED** from India. It yields 45 per cent. of oil of a very light colour, recommended for use by artists on that account.

**No. 85.** Specimens of **FLAX** as harvested.

**No. 86.** Same, steeped and “broken,” ready for the operation of “scutching,” which, whether by hand or machinery, consists in beating and shaking the “broken” flax, in order to free it from loose and useless particles.

**No. 87.** **FLAX**, as imported, of Russian and other growths.

**No. 88.** **HAND HACKLES**, of two degrees of fineness. Through the upright pointed wires of the hackling-frame, the stems of flax are drawn to disentangle or comb them out, being freed, at the same time, from residual extraneous matter. The wire pins are arranged on different frames, in progressive degrees of fineness. The process is now performed by special machinery.

**No. 89.** Linen cloth used to envelop the dead by ancient Egyptians, among whom Flax was cultivated from remote antiquity.

**CASE 17.** This case also contains various fabrics manufactured from flax. Note also an old spinning wheel from Saffron Walden.

In 1905, 74,794 tons of Dressed and Undressed Flax, and 15,304 tons of Tow or Codilla were imported into the United Kingdom. Of Linseed 1,923,940 quarters were imported in the same year.

**CASE 18. No. 90.** A bundle of the dried leaves of the COCA (*Erythroxylon Coca*, Lamk.), the masticatory of the Andes and Peru. The Coca bush is extensively cultivated by the Indians. The leaves are either infused as tea, or, as is usual, chewed with a little unslaked lime. The immediate effect is a gentle excitement, with sensations of high enjoyment. Its use lessens the desire for food, and enables the chewer to undergo an enormous amount of fatigue from an increase of nervous energy. The active principle, Cocaine, is a local anæsthetic. Observe the "Pompona," or lime-flask, of the Indian Coca-chewer, also "Ipadu," the powdered leaf, mixed with a little tapioca, the ashes of *Quinoa*, *Cecropia*, &c. The cultivation of this plant and its varieties has been extended into several British Colonies, notably Ceylon. During the year 1904, 896 tons of Coca leaves were exported from Peru, principally to Germany and the United States, for the manufacture of Cocaine. Between 7 and 8 cwts. of Cocaine were exported from Peru, almost entirely to Germany, during the same period. ["Coca" must be distinguished from "Cocoa" of the shops, the produce of *Theobroma Cacao*, see Case 14; from the Coco plum, see Case 47; and from the Cocoa Nut Palm (*Cocos nucifera*, L.), see Museum No. 2.]

**Malpighia Order** (*Malpighiaceae*). A family chiefly Tropical South American, often with long twining or pendant stems (*lianes*), bearing opposite leaves, and gaudy flowers with clawed petals.

**No. 91.** Transverse section of the stem of an unknown species of *Malpighiaceae*. Observe the curious structure.

Note also SHOEMAKERS' BARK (*Byrsonima spicata*, Rich.). A West Indian tree 30 to 40 feet high; the bark is used for tanning.

**Guaiacum Order** (*Zygophylleae*). The abundance, especially of spinous species, of this order is characteristic of desert vegetation in Egypt and Western Asia. Some of them are fine trees.

Observe mounted specimens of the CREOSOTE PLANT (*Larrea mexicana*, Moric.), a shrubby plant of North America. The twigs are covered with a resinous substance or lac which the Indians mould into balls, and also use in rheumatism. It is sometimes called SONORA GUM.

**No. 92. LIGNUM VITAE** (*Guaiacum officinale*, L.). A small ornamental tree, native of Tropical America. The wood is remarkable for the singular brownish green of the heart-wood; its extreme hardness and toughness adapt it for use for the sheaves of pulleys, pestles, mortars, skittle-balls, &c. It contains a green resin, obtained either from incisions in the trunk, or by heating the wood when broken up into fragments. This is greatly used in rheumatism and skin diseases and as a stimulant.

*G. sanctum*, L., a tree much resembling the foregoing, found in Southern Florida, the Bahamas, Cuba, St. Domingo, &c., is the source of Lignum Vitae exported from the Bahamas, as well as of some of that shipped from Hayti.

**Cranesbill Order** (*Geraniaceae*). Herbs or shrubs, of which the Scarlet Geranium and the common British Cranesbill may be taken as examples. Scattered very unequally over the globe, though particularly numerous at the Cape. Chiefly remarkable for the beauty of their flowers.

The ROSE-LEAF GERANIUM (*Pelargonium capitatum*, Ait.) is largely cultivated in the South of France, Algeria, and the South of Spain for the oil which is distilled from the leaves, used as a perfume and as a substitute for Otto of Rose. Samples of the oil distilled in France and from English grown plants are exhibited.

Observe the anomalous structure of the stem in

**No. 93. GIFDOORN or POISONOUS THORN** (*Sarcocaulon Patersonii*, Eckl. and Zey.), from Namaqualand. It secretes such a quantity of waxy inflammable substance

CASE 18. in the bark that, the woody core decaying away, the stems finally become mere tortuous tubes of wax which burn like a torch with a pleasant odour.

**No. 94.** Parasol cover made of the fibre of the GARDEN NASTURTIUM, not to be confounded with the true *Nasturtium* (Watercress) belonging to the Crucifer Order.

The tribe *Oxalideae* of this order frequently has compound leaves, which are sometimes sensitive, and possess considerable acidity, due to the presence of an acid oxalate of potash. Natives of tropical and temperate countries, chiefly of South America or South Africa.

The tubers of several species of *Oxalis* are edible after being boiled; those of *O. crenata*, Jacq., a native of Peru, are exhibited.

**No. 95.** OXALIC ACID, prepared from the WOOD-SORREL (*Oxalis Acetosella*, L.).

**No. 96.** THE BILIMBI (*Averrhoa Bilimbi*, L.). The fruit of a Tree-Sorrel cultivated in tropical countries. In India it is generally used in pickles and in curry; the flowers are made into preserves.

Notice also the CARAMBOLA (*A. Carambola*, L.), another widely cultivated species. The fruit is eaten in India and elsewhere, and is said to be an excellent antiscorbutic.

**Rue Order** (*Rutaceae*). Chiefly trees or shrubs, widely scattered over the warmer temperate regions of the globe; numerous in Australia, at the Cape, and in Tropical America. The order is characterized by the prevalence of a bitter, odorous, essential oil, contained in glands scattered over the leaves, bark, &c.; these parts in several species are employed in medicine as febrifuges, antispasmodics, &c.

**No. 97.** CUSPARIA or ANGOSTURA BARK, from a small tree (*Cusparia febrifuga*, Humb.), found in the eastern parts of Venezuela. It is a stimulant aromatic tonic and febrifuge, producing in large doses nausea and purging.

**No. 98.** Leaves and oil of common RUE (*Ruta graveolens*, L.), a plant much esteemed in ancient and rustic medicine. CASE 18.

Observe wood, fruits, and seeds of the WILD CHESTNUT (*Calodendron capensis*, Thunb.), an ornamental tree of the Cape of Good Hope. The shining black seeds are used for necklaces and similar ornaments.

**No. 99.** BUCHU leaves, from three species of *Barosma* (*B. crenulata*, Hook., *B. serratifolia*, Willd., and *B. betulina*, Bart.), all natives of the Cape of Good Hope. CASE 19.  
They have tonic, diuretic, and stimulant properties, and are regularly imported into this country.

Note on the bottom shelf of this case specimens of West Indian and Porto Rico SATINWOOD sometimes known as YELLOW SANDERS WOOD furnished by one or more undetermined species of *Zanthoxylum*.

**No. 100.** Portion of stem of *Zanthoxylum Clava-Herculis*, L., of the West Indies, with walking sticks made from it. Observe the curiously tubercled bark.

**No. 101.** JAPAN PEPPER (*Zanthoxylum piperitum*, DC.). Used as a condiment in China and Japan. The fruit capsules are remarkably fragrant when bruised, from a pungent aromatic principle residing in the tubercles of the rind.

In the middle division of this case are shown samples of JABORANDI leaves of commerce obtained from *Pilocarpus Jaborandi*, Holmes, and other species. Employed medicinally as a powerful diaphoretic and sialogogue.

Bark of *Toddalia aculeata*, Pers., a straggling plant of India, Ceylon, Java, &c. The root bark (which under the name of LOPEZ ROOT was at one time a noted remedy for diarrhoea in Europe) is highly valued in India as a stimulating tonic. The whole plant is hot and pungent, the ripe berries being fully as pungent as black pepper; an excellent pickle is prepared from them in India.

Leaves of *Murraya Koenigii*, Spreng., known as the CURRY LEAF TREE in India, the aromatic leaves being used to flavour curries. The wood is durable and used for agricultural implements.

**CASE 19.** **No. 102.** Fruits of the WAMPI of China (*Clausena Wampi*, Oliv.), cultivated in India. The fruits have a sub-acid flavour and are said to make excellent preserves.

Observe in this and the following case fruits of different varieties of Lime, Shaddock or Pampelmousse, Lemon, Forbidden Fruit, Orange, &c., all afforded by trees nearly related to each other, and difficult to distinguish in the absence of fruit. These, and especially the Orange, are cultivated in warm countries.

**No. 103.** Fruits, oil, &c., of the LIME (*Citrus medica*, L., var. *acida*, Brand.), a native of India regularly cultivated in Montserrat, Dominica, and Jamaica, more particularly for its juice, which is imported into this country in large casks.

**No. 104.** PAMPELMOUSSE or SHADDOCK, fruit of *Citrus decumana*, Murr. The PUMELO or POMALO is a smaller-fruited variety. The Grape Fruit cultivated in the West Indies is another variety of this species.

**CASE 20.** **No. 105.** LEMONS, the fruit of *Citrus medica*, L., var. *Limonum*, Brand. Largely cultivated on the Mediterranean coast and in Spain, Portugal, the Canaries and Azores, Sicily supplying the largest quantity for export purposes. The candied rind of the fruit forms Lemon peel, and Oil or Essence of Lemon is expressed from the fresh rind. From the juice of the Lemon, as well as from that of the Lime and Bergamot, CITRIC ACID is manufactured, samples of which are shown.

**No. 106.** FINGERED CITRON, a variety of *Citrus medica*, L., having the fruit curiously divided into large finger-like lobes.

Fruits of the KUMQUAT (*Citrus Aurantium*, L., var. *japonica*, Hook. f.), cultivated in China and Japan. They are usually preserved whole in syrup.

**No. 107.** SWEET, CHINESE or PORTUGAL ORANGE (*Citrus Aurantium*, L.). There are numerous varieties very extensively grown for their fruits in the warmer parts of the world. In the island of St. Michael, in the Azores, a single tree has been said to produce 20,000 Oranges fit for exportation. Of Lemons and Oranges

5,905,554 cwts. were imported into the United Kingdom in 1905.

Oils of **NEROLI** and **BERGAMOT**, highly esteemed as perfumes, are obtained, the first from the flowers of *C. Aurantium* by distillation, and the second from the rind of the Bergamot variety, either by distillation or expression. The small immature fruits which drop from the trees, when collected and dried, form the Orange Berries of pharmacy. They are used for flavouring Curaçoa, &c. The smaller ones, smoothed by a lathe, form Issue-peas.

**No. 108.** Fruits, leaves and gum of the **WOOD APPLE** (*Feronia elephantum*, Corr.), a large Indian tree. The pulp of the fruit is acid and is made into a jelly. A gum similar to gum arabic is exuded by the tree, and the wood is used in house-building, for agricultural implements, &c.

**No. 109.** **BAEL**, or **BELA** of India (*Aegle Marmelos*, Corr.). The pulp of the fruit is an aperient and a valuable remedy in dysentery; its rind and the dried unripe fruit are astringent.

**Quassia Order** (*Simarubeae*). Trees or shrubs, growing mainly in the tropical parts of America and Africa, distinguished by an intense bitterness. Some species are employed medicinally as tonics.

**No. 110.** **SURINAM QUASSIA WOOD** (*Quassia amara*, L.). This wood is the Original Quassia of the Materia Medica and the one upon which the reputation of Quassia as a medicine was established, but as the tree yielding it was small and slow-growing the supply was soon exhausted, and it is now unknown in British medicine. See also No. 113.

**No. 111.** Fruits and seeds of **CEDRON** (*Simaba Cedron*, Planch.), a small tree of Central America. The seed is considered a valuable specific for snake bites, intermittent fevers and for stomach complaints. The bark and wood have bitter and tonic properties.

**No. 112.** **SIMARUBA BARK** (*Simaruba amara*, Aubl.). A large tree, native of Tropical America, &c.

**CASE 20.** The root-bark of this and probably of *S. glauca*, DC., comes to this country packed in bales, usually direct from Jamaica. Used as a bitter tonic and in the treatment of dysentery.

Observe mounted specimens of silkworms and samples of silk of the Ailanthus silkworm of China (*Attacus Cynthia*, Drury), now introduced extensively into Western Europe and Algeria; it feeds on *Ailanthus glandulosa*, Desf., which is perhaps the most successful tree for the experimental rearing of different species of silkworms.

Note also MATTIPÁL, the fragrant resin of *Ailanthus malabarica*, DC., used in India medicinally, especially in dysentery, and sometimes burnt as incense in Hindu temples.

**CASE 21. No. 113. QUASSIA WOOD** (*Picraena excelsa*, Ldl.). A large tree, native of Jamaica and other West Indian Islands. This tree furnishes the Quassia or Bitter Wood of chemists and is imported into this country in logs of varying length; it has an intensely bitter taste and is made into cups for holding water to produce a tonic draught. Quassia is also used by brewers as a substitute for hops in the manufacture of beer and ale, and in horticulture as an insecticide.

Note root of PENAWAR PAIT or BEDARA PLUM (*Eurycoma longifolia*, Jack), used by the natives at Singapore as a febrifuge.

**No. 114. DIKA BREAD.** Made from the seeds of the WILD MANGO of Sierra Leone (*Irvingia Barteri*, Hook. f.). The tree is a native of West Tropical Africa and attains a height of 30 to 40 feet. The seeds contain a quantity of oil or fat similar to cocoa butter which is used by the natives in cooking. The oily seeds of the OWALA (*Pentaclethra macrophylla*, Benth.: see Case 43) are sometimes used for mixing with those of *Irvingia*. Note fruits of the CAY CAY (*I. Oliveri*, Pierre), from Cochin China, where the fat from the seeds is also used as food. Note fruits, wood and bark of *Balanites Roxburghii*, Planch., a small thorny Indian tree. Nearly all parts of this tree are used in native medicine in India and the nut is employed for fireworks; a small hole is drilled through which the kernel is extracted; the nut is then filled with



powder which bursts with a loud report. From the fruits of the EGYPTIAN MYRABOLAN (*B. aegyptiaca*, Delile), an intoxicating drink is made by the negroes on the West Coast of Africa. CASE  
21.

**Ochna Order** (*Ochnaceae*). A small order of glabrous shrubs or trees found in the tropics of both hemispheres.

Note the winged fruits, the seeds, and wood of *Lophira alata*, Banks. The kernels yield "MENI" oil employed by the natives of Sierra Leone in cookery and for dressing the hair. The wood is imported into this country from the West Coast of Africa as "AFRICAN OAK" and is used for furniture and in turnery. True African Oak is *Oldfieldia africana*, Benth.

**Myrrh Order** (*Burseraceae*). All shrubs or trees, with compound, dotted leaves, growing in warm countries. Very many abound in fragrant balsams or resins, employed in medicine, fumigation, and perfumery.

**No. 115.** GUM OLIBANUM or FRANKINCENSE. The produce of *Boswellia Carteri*, Bird., and probably other species inhabiting the Somali coast and also the south coast of Arabia. The gum exudes from wounds made in the stems; when first removed from the trees it is very soft, but quickly hardens. It is collected for commercial purposes exclusively in the countries mentioned above. Olibanum is regarded as stimulant, diuretic, and diaphoretic, but is seldom used in medicine at the present time. Its chief application now is as an ingredient in incense for use in churches.

**No. 116.** LUBAN MAITEE. A very fragrant resin obtained from *Boswellia frereana*, Bird. Largely used in the East as a masticatory.

Also GUGAL, the resin of the SALAI TREE of India (*B. serrata*, Roxb.), where it is used for incense.

**No. 117.** MYRRH. Much doubt exists as to the botanical origin of this product which is a gum-resin afforded by species of *Commiphora* [*Balsamodendron*], shrubs of Somali-land, Southern Arabia, &c. AFRICAN MYRRH is believed to be obtained from *Commiphora Schimperi*, Engl., and perhaps other species of the same

CASE 21. genus; that from Arabia is probably afforded by *C. Myrrha*, Engl., *C. Opobalsamum*, Engl., and *C. simplicifolia*, Schweinf. As it exudes from the tree, Myrrh is at first soft, of an oily nature, and of a yellowish colour. It ultimately hardens, changing from a golden tint to a reddish brown. Most of the Myrrh finds its way to Bombay, where it is sorted and re-shipped to Europe and elsewhere. Myrrh is used in medicine as a stimulant, tonic, and expectorant, and also as a wash for strengthening the gums. Its use as an ingredient in incense and perfumes dates from high antiquity. "It entered into the composition of the holy oil in use by the Jews, and also into the *Kyphi* of the Egyptians, which was used in fumigations, and for embalming," &c.

**No. 118. BALSAM OF MECCA.** This oleo-resin is supposed to be the produce of *Commiphora* [*Balsamodendron*] *Opobalsamum*, Engl. It is a greenish, viscid, turbid liquid, with an agreeable odour when fresh, thickening and becoming of a yellowish colour with age. It is the Balsamum of the Romans and wonderful properties were formerly attributed to it, but its use has become obsolete in Europe. In the East, however, it is still esteemed for its fragrance and medicinal properties. The plant is said to be extinct in India and Egypt where it formerly grew. The present small supply is obtained from Arabia.

Observe specimens of INDIAN BDELLIUM from *Commiphora Mukul*, Engl., AFRICAN BDELLIUM from *C. africanum*, Engl., BISSA BÔL from *C. Kataf*, Engl., and HOTAI from *C. Playfairii* (*Balsamodendron Playfairii*, Hook. f.).

Further light is still needed as regards the true sources of these resins; and specimens of the shrubs (in flower or fruit) which furnish them, accompanied by a sample of the product, would be greatly valued.

Other resinous products are exhibited in this case. Amongst them CARANA, a gum-resin, possibly that of *Protium Carana*, March, extracted by the Maquiritare and Piaroa Indians on the Orinoco. Used in medicine for plasters.

**No. 119. HYAWA GUM** (*Protium heptaphyllum*, March). Used as incense in British Guiana.

**No. 120.** Scented wood of the LIN-A-LOA of Mexico CASE  
21.  
(*Bursera delpechiana*, Poiss.). Used in San Francisco in the manufacture of furniture; an otto prepared from it is used in perfumery.

GOMMIER or WEST INDIAN BIRCH (*Bursera gummi-fera*, L.). All parts of the tree yield a fragrant gum-resin, used for flambeaux or torches. Note examples from Dominica.

**No. 121.** MANILA ELEMI or BREA. A fragrant gum-resin derived from *Canarium luzonicum*, A. Gray, extensively used in the Philippines in caulking boats, and for making torches. It is exported to Europe for medicinal purposes, being employed in this country for the preparation of ointments. The seeds are edible and yield an oil. CASE  
22.

Note specimens of the carved fruits of *Canarium Pimela*, Kon., from Amoy. There is a considerable trade done in the district in these carvings, which may be purchased for a few cents, or a much higher figure, according to their merit and the popularity of the carver.

**No. 122.** BLACK DAMMAR, the produce of *Canarium strictum*, Roxb., a large deciduous tree of the Western Gháts. The resin is obtained by gashing the lower parts of the stem and then setting it on fire. Used in India in the manufacture of bottling wax, varnishes, &c. *C. bengalense*, Roxb., yields an amber-coloured resin, employed in India as incense.

Note the fruits of *Santiriopsis balsamifera*, Engl., which yield the BALSAM OF ST. THOMAS, also specimens of GUM OPAL or INCENSE GUM from the MOUNTAIN GOMMIER (*Dacryodes hexandra*, Gris.), from the West Indies. Also wood and oil of WEST INDIAN SANDAL (*Amyris balsamifera*, L.), a native of Jamaica.

**Melia Order** (*Meliaceae*). Trees or shrubs, often with pinnated leaves; growing principally in the warmer parts of America and Asia.

**No. 123.** NEEM or MARGOSA (*Melia Azadirachta*, L.). An important Indian tree, held in great estimation by the natives. Almost every part of the tree has its use. Idols are made of the wood, which is also used for

CASE 22. furniture, shipbuilding, &c. The bitter bark is employed as a febrifuge; the leaves are used for poultices, and when dried are employed in protecting clothing and books against insects; the clear amber-coloured gum is considered stimulant. From the pulp of the fruit is expressed a yellow-coloured fixed oil, which is bitter and acrid; used for burning, and in medicine as an antiseptic and anthelmintic.

**No. 124.** PERSIAN LILAC, BASTARD CEDAR, or BEAD TREE (*Melia Azedarach*, L.). A tree commonly cultivated throughout India and all warm countries. The wood is handsomely marked, takes an excellent polish, and is used for furniture. The fruit yields an oil, the nuts are strung as beads, and the bitter root-bark is employed in medicine as an anthelmintic.

Note flowers of *Aglaia odorata*, Lour., used by the Chinese for scenting tea.

Also edible fruit of the LANSIA or LANGSAT (*Lansium domesticum*, Jack), of the Malay Islands. It is much esteemed in Java, where it is known as "doekoe."

**No. 125.** Wood and fruits of *Walsura piscidia*, Roxb., a moderate-sized tree of India and Ceylon. The wood is used in Southern India for various purposes, and the pulp of the fruit is employed to intoxicate fish.

CASE 23. **No. 126.** MAFUREIRA SEEDS (*Trichilia emetica*, Vahl). A tree widely distributed in Tropical Africa. The seeds afford a thick heavy oil used in native cookery. During the year 1900, 270 tons of these seeds were imported into Marseilles from Inhambane, probably for soap-making.

**No. 127.** MAHOGANY, the wood of *Swietenia Mahagoni*, L., *S. macrophylla*, King, and perhaps of other large forest trees of Tropical America and Cuba. One of the most valuable of furniture woods. There is a record of a single log which lay near the south coast of Cuba, too heavy to carry to a port, measuring 9 ft. broad, 6 ft. high, and 12 ft. in length; supposed weight about 18 tons. It had been there many years, and probably remained till it decayed. The two species mentioned above have been introduced into India, where they are largely planted.

**No. 128.** Model of a truck, laden with mahogany, as employed in bringing the logs to the works, from the interior of Honduras. CASE  
23.

**No. 129.** CRAB TREE (*Carapa guianensis*, Aubl.). A large tree of Tropical America and Africa. The wood is used in British Guiana for furniture, shingles, and the masts and spars of vessels, &c. The seeds yield a fatty oil called CARAP or CRAB OIL, used by the natives for burning in lamps, for anointing the hair, and in medicine as an anthelmintic, also for the healing of wounds.

**No. 130.** Wood and fruits of the CAIL-CEDRA or MAHOGANY TREE of the Gambia (*Khaya senegalensis*, Juss.). This is one of the many trees furnishing the so-called "Mahogany" exported from the West Coast of Africa.

**No. 131.** Bark and wood of ROHAN TREE or INDIAN REDWOOD (*Soymida febrifuga*, A. Juss.). A large and beautiful tree of Central and Southern India. The dark coloured, heavy and durable wood is used for construction, well-work, ploughshares, and oil-mills, and it is stated to be not much attacked by white ants. The bark has bitter and astringent properties, and is used as a febrifuge, in tanning, and as a remedy for diarrhoea and dysentery.

**No. 132.** CHITTAGONG WOOD, the beautifully figured wood of *Chickrassia tabularis*, A. Juss., a large tree of India, Burma, &c. Used for furniture and for carving. The bark is powerfully astringent, and the flowers give a red or yellow dye.

**No. 133.** CEDAR WOOD of New South Wales, TOON of India (*Cedrela Toona*, Roxb.). A tall handsome tree of the Sub-Himalayan forests, Bengal, Burma, South India, &c. The wood is durable and beautifully marked, and is used both in India and Australia for all kinds of furniture, house joinery, and ornamental work. It is not attacked by white ants. The wood is imported into this country from Burma under the name of "Moulmein Cedar." The bark is astringent, yields a resinous gum, and is employed in India as a febrifuge. The flowers yield a red and yellow dye and the young shoots and leaves, as well as the seeds, are used to feed cattle.

CASE No. 134. Wood, gum, &c., of WEST INDIAN CEDAR  
23. (*Cedrela odorata*, L.). The wood is considered the best for cigar boxes as it cuts freely, is durable, and has a pleasant smell.

[Although called Cedars, the *Cedrelas* are quite distinct from the true Cedar (*Cedrus Libani*, Loud.) which belongs to the Pine Order. See Museum No. III.]

No. 135. SATIN WOOD, afforded by *Chloroxylon Swietenia*, DC., a moderate-sized tree of India and Ceylon. The wood is durable, close-grained and of a beautiful satiny lustre, and is largely employed in cabinet-work, and for the backs of brushes, &c. It takes an excellent polish, preserving a handsome appearance for a long time.

CASE No. 136. YELLOW WOOD (*Flindersia oxleyana*,  
24. Muell.). A tree of New South Wales and Queensland. The timber is strong, durable, and fine-grained, and is used in Australia for boat-building, cabinet-work, &c. Note specimens of wool in various shades of yellow-brown dyed with this wood.

**Olaç Order** (*Olacineae*). An order of trees, shrubs or climbing plants, widely dispersed over the tropical and sub-tropical regions of the globe.

Observe fruits and seeds of *Coula edulis*, Baill., a native of West Tropical Africa. The kernels are edible and yield an oil.

No. 137. Fruits and wood of *Ximenia americana*, L., a shrub or small tree found in the tropics of both hemispheres. The acid-sweet and aromatic berries are eaten both in the West Indies and in India. The wood is often powdered and used as sandal-wood by the Brahmins of the Coromandel coast. Under the name of SENNETT the seeds are sometimes imported into Liverpool from West Africa as oil-seeds. Observe also the oleaginous seeds of an undetermined species of *Heisteria*, also occasionally imported into Liverpool for the sake of the oil.

Note fruits, and wood of *Phytocrene gigantea*, Wall., a gigantic climber of the Chittagong and the Burmese forests. "The stem on being cut gives out a quantity of fresh water good for drinking."

**No. 138.** ODALL fruits, and oil obtained from seeds of *Sarcostigma Kleinii*, W. and A., from Cochin, where the oil is used in rheumatism. CASE 24.

**Holly Order** (*Ilicineae*). A group of shrubs and trees, represented in Britain by the Holly. The species are not numerous, though widely scattered over the world.

**No. 139.** Wood of the HOLLY (*Ilex Aquifolium*, L.), the favourite European evergreen. The hard white wood is used in making Tunbridge ware, for the stringing or lines in cabinet work, calico-printers' blocks, &c. The straight, flexible shoots are used for walking sticks and whip handles. BIRD-LIME is the juice of Holly-bark, extracted by boiling, mixed with a third part of nut-oil.

Note YAUPON or YAPON TEA (*Ilex Cassine*, Walt.), an evergreen shrub of the Southern United States. The leaves contain caffeine, and on that account were formerly much employed by the Indians and are now occasionally used by white settlers as tea.

**No. 140.** YERBA DE MATÉ, or PARAGUAY TEA, the leaves of *Ilex paraguensis*, A. St. Hil., (of which there are several varieties) and possibly of other species of *Ilex* found in South America.

The leaves are prepared for commerce by being scorched and dried while still attached to the branches brought in by the collectors; they are then beaten, separated, coarsely ground in rude mills, and packed in skins and leathern bags or in a more attractive form as will be seen from examples in this case, as also in the black table case on the centre of this floor.

The leaves are infused in small teapots, of which several forms are here shown, and the tea is imbibed either from the spout or by:—

**No. 141.** BOMBILLA, or tube with wire network or perforations at the bottom. Maté is one of the most important economic products of South America and is the favourite drink of much of the population in the southern parts of Brazil, Paraguay, Uruguay, the Argentine Republic, &c. The consumption is enormous. Maté has been found to contain 0·13 per cent. of caffeine, and is occasionally advertised for sale in this country.

**CASE 24.** **Spindle-Tree Order** (*Celastrineae*). A family of woody plants, mostly extra-tropical, though widely spread, both in the north and south hemispheres. In Britain the order is represented by a single small tree, the **SPINDLE TREE** (*Euonymus europaeus*, L.). The ripe fruits remain on this tree long after the leaves fall, and open while still attached, exhibiting the bright orange-coloured pulp (the arillus) by which the seeds are embraced. The young shoots formerly furnished skewers for butchers.

**No. 142.** Wood of **PAI'CHA** (*Euonymus europaeus*, L., var. *hamiltonianus*). A small tree, native of India, Japan and China. Used at Ningpo, China, for carving, and proposed as a substitute for boxwood for engraving purposes in this country. A block prepared for engraving, as well as one engraved, are exhibited; also a carved frame from Ningpo. (See also No. 31.)

Note leaves of the **KHÂT, QÂT** or **CAFTA** of Arabia, the so-called **ARABIAN TEA** (*Catha edulis*, Forsk.). These, together with the twigs, form a considerable article of commerce amongst the Arabs, who chew them, both in the green and dry state to promote wakefulness. In the interior a decoction resembling tea is said to be made from the leaves. They do not, however, contain caffeine nor any alkaloid related to it.

**CASE 25.** Specimens are here shown of the bark, fruit, seeds and oil of the **KOKOON** tree of Ceylon (*Kokoona zeylanica*, Thw.). The yellow inner bark is employed medicinally, and is also used in the preparation of a kind of snuff, considered beneficial in headache. Oil is expressed from the seeds and used for burning in lamps.

Observe various specimens of hard, close-grained woods, belonging to the genus *Elaeodendron* from South Africa and India, also the curious fruits and seeds of species of *Hippocratea*.

Note seeds and oil of *Celastrus paniculatus*, Willd., a large climbing shrub found throughout India, Burma and Ceylon. Two kinds of oil are obtained in India from the seeds, one by expression, which is of an orange colour and is used for burning in lamps and in medicine. The other form is known as **BLACK OIL** or **OLEUM NIGRUM** being



obtained by destructive distillation of the seeds. Used by the Hindus as a diuretic and as a remedy for Beri-Beri. CASE  
25.

**Buckthorn Order** (*Rhamnaceae*). An extensive group of trees and shrubs, often armed with spines. Found nearly all over the globe, excepting the extreme north. Two species grow in Britain.

Note **POPLI-CHEKKÉ** (*Ventilago maderaspatana*, Gært.). A forest climber of India, Burma, and Ceylon. The root bark is a much valued dye-stuff in Southern India, as it is rich in a beautiful red colouring matter.

**No. 143.** **LOTE FRUIT** (*Zizyphus Lotus*, Lam.), of the Mediterranean region, said to be the Lotos of the ancient Lotophagi.

**No. 144.** **INDIAN JUJUBE or CHINESE DATE** (*Zizyphus Jujuba*, Lam., and allied species). A wholesome fruit, preserved in syrup by the Chinese after the surface has been scratched in numerous fine longitudinal lines; used also when dried and in a pickled state. *Z. Jujuba* is a small prickly tree regularly cultivated all over India and widely distributed in tropical countries. The leaves are commonly used as food for the Tasar silkworm.

*Z. sativa*, Gært. [*Z. vulgaris*, Lam.], also yields an edible fruit commonly eaten in the countries bordering the Mediterranean.

Observe **CASCARA SAGRADA** (Sacred Bark), identical with Chittem Bark, produced by a small tree, 12 to 20 feet high (*Rhamnus purshiana*, DC.), found on the Pacific slopes of the United States. The bark has a characteristic odour and persistent, nauseous, and bitter taste; it is much employed in North America and in this country, in medicine, as a tonic-laxative.

**No. 145.** Wood of **ALDER BUCKTHORN** (*Rhamnus Frangula*, L.). A slender straggling bush, 6 to 12 feet high, in woods and hedges in this country; found also throughout Europe, and in Siberia, Caucasus, and North Africa. The bark of the trunk and larger branches is purgative and is employed in medicine. The wood is used by gunpowder makers under the name of **DOGWOOD**

CASE 25. in the manufacture of the best rifle powders, and is imported for this purpose in large quantities from Holland and Belgium.

Observe specimens of LO-KAO, or CHINESE GREEN INDIGO, prepared in China from the barks of *R. dahurica*, Pall., and *R. tinctoria*, Waldst. and Kit., and used for dyeing various shades of green. At one time this product was largely employed at Lyons for dyeing silks.

No. 146. SAP GREEN, a well-known pigment obtained from the ripe berries of the common BUCKTHORN (*R. cathartica*, L.), and other species, prepared by mixing the fresh juice of the berries with lime and evaporating to dryness.

No. 147. PERSIAN or YELLOW BERRIES, the fruits of *Rhamnus infectoria*, L., and probably other species. The berries, the size of currants, grow in clusters; the expressed juice of the young berries is bright yellow and mixed with indigo forms a brilliant and durable green, used in dyeing wool for Oriental carpets, also for dyeing mixed fabrics and by leather-dressers and calico-printers. The fruits are variously known in commerce as "Persian Berries," "Avignon graines," "Spanish Berries," and "Turkish Berries."

CASE 26. On an upper shelf of the first compartment of this case note fruits of the CORAL TREE (*Hovenia dulcis*, Thb.), a small tree distributed over China, Japan, and the Himalayas. The fruits, which are about the size of a pea, are borne on enlarged fleshy peduncles which contain a sweet juice and are edible.

No. 148. MABEE BARK, produced by *Ceanothus reclinatus*, L'Herit. [*Colubrina reclinata*, Brongn.], a native of South America. The bark is largely used in the West Indies for the preparation of a stomachic drink.

Note specimens of CHAW STICK or CHEW STICK (*Gouania domingensis*, L.) from the West Indies. The stem affords an agreeable bitter used locally as a substitute for hops in ginger beer. Reduced to powder it forms an excellent dentifrice, and the slender stem cut into short lengths serves the negro as a tooth-brush. Also the stem, curiously flattened in alternating triangular joints, of *Colletia cruciata*, Gill. and Hook., a Chilian shrub.

**Vine Order** (*Ampelideae*), of which the GRAPE-VINE (*Vitis vinifera*, L.), the most important plant of the order, may be taken as the type. They are all climbing, jointed shrubs, often with abortive flower-branches serving as tendrils to lay hold of their support. They are chiefly East Indian. The Grape-Vine now cultivated so extensively in France, Germany, South Europe, the Atlantic Islands, the United States, the Cape, &c., was very probably native originally of Western Asia, and to the south of the Caspian. From its innumerable varieties, affected by different climates and soils, we have, besides grapes yielding the various wines of commerce, other sorts which are dried, forming the Valencia, Muscatel, and Sultana (without seeds, from Turkey) Raisins; also Currants, the dried fruit of a small-fruited variety of the Grape-Vine (*V. vinifera*, var. *corinthiaca*), cultivated in the Ionian Islands, Greece, Lipari, &c. These are quite distinct from any species of *Ribes*, the currant of our gardens, to which they are not botanically related.

Nearly 12,000,000 gallons of Wine were entered for home consumption in 1905, 5,713,393 gallons of which were imported from Spain and Portugal.

Of Raisins 687,162 cwts., and of Currants 1,078,069 cwts., were entered for home consumption in the same year.

Grape seeds contain about 18 per cent. of oil, which is extracted for illuminating purposes in Italy, Greece and the Levant.

Amongst other products of the grape exhibited are ARGOL from Greece, deposited on the sides of wine vats, and containing 50 to 70 per cent. of Tartaric Acid. WINE LEES from Greece, containing about 30 per cent. of Tartaric Acid. TARTAR from St. Antimo, Italy, prepared from Lees or Argol, and containing 65 to 77 per cent. of Tartaric Acid. Also crude TARTRATE OF LIME, and a very fine specimen of crystallised TARTARIC ACID. Specimens are also exhibited of YESO, a kind of plaster, from Port St. Mary, Cadiz Bay, used in Spain to sprinkle on the grapes before being pressed. SPANISH EARTH, used likewise in Spain, and to a small extent in England, for fining wine. GRAPE SUGAR, which is less sweet than cane, and is not so readily dissolved in water.

**CASE 26.** In this case are numerous illustrations of the progress of the *Phylloxera* and other diseases to which the Vine is subject.

**Soapwort Order** (*Sapindaceae*). Trees or climbing plants, chiefly of tropical countries. The fruits of several are edible; others possess a saponaceous principle, and lather freely in water. Those belonging to the sub-order *Acerineae* are trees principally of temperate Europe, Asia, and America, having opposite and mostly lobed leaves, with the veins radiating from the leaf-stalk. The Sycamore (*Acer Pseudo-platanus*, L.), extensively planted in Britain, is an example of this group.

Observe stems and seeds of *Cardiospermum Halicacabum*, L., a climber found throughout India and in most tropical and sub-tropical countries. The roots are employed in India in rheumatic and nervous diseases. The seeds and leaves are used in medicine and the latter are also cooked as a vegetable in the Moluccas.

**No. 149.** **GUARANA BREAD** of Brazil, made from the pounded seeds of *Paullinia Cupana*, H. B. and K. [*P. sorbilis*, Mart.]. The powder is kneaded with a little water and the paste made into rolls or sticks and more recently into ornamental figures. These are dried in the sun. A cooling drink is made from this product in the interior provinces of North Brazil by grating into water the hard paste on the rough tongue of a fish, the Piraruca (see specimen), sugar being sometimes added. Guarana contains *Caffeine* to the extent of 4.3 per cent., and has been used medicinally in nervous headache. It is occasionally imported into this country.

Near these specimens are shown stems of *Paullinia curassavica*, Jacq., and *P. sphaerocarpa*, Rich., of the West Indies, used as walking sticks, and known as **SUPPLE JACKS** in consequence of their flexibility.

**CASE 27.** **No. 150.** Wood of the **HORSE CHESTNUT** (*Aesculus Hippocastanum*, L.). A Turkish tree, long planted for shade and ornament on the Continent and in England. The wood, which is soft, and not durable, is turned to little account. The fruits are used in Switzerland and Turkey for feeding sheep, horses, &c.

Note also fruits, seeds and wood of the INDIAN HORSE CHESTNUT (*A. indica*, Colebr.). A handsome ornamental tree similar in appearance to the European species. In India the wood is employed for a variety of purposes, but more particularly for turned articles. The fruits are given as food to cattle and goats, and in times of scarcity are ground and mixed with flour and consumed by the hill tribes. CASE  
27.

**No. 151.** Fruit of the AKEE (*Blighia sapida*, Koen.). A tree of West Tropical Africa. The edible portion is the *aril*, the succulent socket developed round the base of each seed. This aril is eaten when cooked and forms a very palatable food but it must be eaten before fermentation sets in, otherwise it is considered unwholesome. The seeds yield by expression a solid oil or fat, a sample of which is exhibited.

**No. 152.** Wood, fruits, oil, and twigs bearing lac, of the KOSUMBA (*Schleichera trijuga*, Willd.), an important deciduous forest tree of India, Burma, &c. The wood is very strong and durable; used for oil and sugar mills, rice-pounders, agricultural implements, &c. The fruits are edible, and the seeds yield an oil used for burning in Southern India and Burma, and reputed to be the original Macassar oil. The best lac is produced on this tree.

**No. 153.** SOAP BERRIES, the fruits of *Sapindus Saponaria*, L., a small tree of Tropical America and the West Indies, where the seed-vessels, which contain saponin, are employed as a valuable substitute for soap. The hard black seeds take a fine polish and are used for making necklaces, buttons, &c.

The fruits of *S. trifolius*, L., and *S. Mukorossi*, Gaertn., Indian species, are also used as soap for washing silk and woollen fabrics, clothing, &c.

**No. 154.** LITCHIS (*Nephelium Litchi*, Camb.), the fruits of a handsome evergreen tree of China, now largely cultivated in northern India. The fleshy aril surrounding the seed is highly esteemed for dessert, more particularly in a fresh state. The dried fruits may frequently be seen in fruiterers' shops in this country.

**CASE**    **No. 155.** LONGANS (*Nephelium Longana*, Camb.),  
27. the fruits of a large evergreen tree of India, Burma, Ceylon, &c. The fruits are somewhat smaller than those of the Litchi, and are much inferior in flavour.

Note LONGAN PULP prepared in Formosa by peeling and stoning the fruit of *N. Longana*, and drying and baking the pulp. This product is largely used by the Chinese for the preparation of a refreshing drink or as a febrifuge.

**No. 156.** RAMBUTANS, the fruits of *N. lappaceum*, L., a small tree of the Malayan Archipelago. The fruits when fresh are of a bright red colour, and the sub-acid pulp is highly esteemed by the natives.

**No. 157.** TULIP WOOD of Australia (*Harpullia pendula*, Planch.). A strong and durable wood much used for cabinet work in Australia.

**CASE**    **No. 158.** Wood of the SYCAMORE (*Acer Pseudo-*  
28. *platanus*, L.), and MAPLE (*A. campestre*, L.). The white soft wood of the former was much used before the general introduction of earthenware for making trenchers, bowls, platters, &c. At the present day it is chiefly used for table-tops, bobbins, and other turnery. Maple wood is employed for similar purposes.

Observe specimens of the wood of various species of *Acer* from the East Indies and North America. Amongst them are *Acer dasycarpum*, Ehr., and *A. rubrum*, L., the latter being used for cabinet work, turnery, &c. Note also facsimiles of the leaves of these species, showing autumnal colouration.

**No. 159.** Wood of the SUGAR MAPLE or HARD MAPLE (*Acer saccharinum*, Wang.). A large tree of great economic value, of the United States and Canada. The wood is hard, heavy and close-grained, and largely used for furniture, interior finish, flooring, &c. Sometimes the wood exhibits beautiful curled and spotted markings (Bird's-Eye Maple), which is much valued for inlaying, panelling, and for high-class furniture.

**No. 160.** MAPLE SUGAR is principally made from this species in North America. The sweet sap is collected

in the spring by tapping the tree to the depth of about half-an-inch with an auger, and inserting a spout. The juice is boiled down to a syrup, clarified and crystallized. Good Sugar Maples yield each about an average of four pounds of sugar in the season.

CASE  
28.

In the small Order *Sabiaceae*, note fruits of the SNAKE NUT (*Ophiocaryon paradoxum*, Schomb.). A large tree of British Guiana, the embryo of which is coiled up in the form of a snake.

**Cashew-Nut Order** (*Anacardiaceae*). Chiefly large tropical trees, often with a resinous or caustic juice; several species bear very valuable fruit. They occur both in the Old World and the New; some extend into temperate countries, a few reaching the south of Europe. The flowers are usually very small.

**No. 161.** A very complete and unique series, illustrating the preparation of JAPANESE LACQUER, and the manufacture of lacquer ware. (1) Stems of the LACQUER TREE (*Rhus vernicifera*, DC.), showing the incisions made for collecting the juice; (2) Instruments used for making the incisions, paring the bark, &c.; (3) Bamboo pot for holding the lacquer; (4) Glove used to protect the hand of the collector from the effects of the acrid juice. Note also numerous specimens of lacquer in different stages of preparation, or used for different kinds of work. Also dyes, colouring matters, and other materials, together with brushes, squares and compasses used by the artists in drawing the designs. On the top of the case is a drying press, in which the work is put to dry. Boxes of finished lacquer ware are also shown on the upper shelves of the next case, and in a special case near Case 40, is a fine collection of finished specimens, and some others showing the progress of the work.

CASE  
29.

**No. 162.** JAPAN WAX. Afforded by the small fruits (specimens of which are exhibited) of *Rhus vernicifera*, DC., and *R. succedanea*, L., employed in candle-making.

CASE  
30.

Some of the species of *Rhus* are very poisonous, notably the POISON OAK (also termed POISON IVY) of North America (*Rhus Toxicodendron*, L.), contact with the leaves of which produces in some constitutions violent inflammation followed by blisters and ulcers.

**CASE**      **No. 163.** WOO-PEI-TSZE or CHINESE GALLS (*Rhus*  
**30.**      *semialata*, Murray). Imported from China and Japan for  
 dyeing purposes.

**No. 164.** SUMAC or SUMACH. The powdered leaves of *Rhus Coriaria*, L., a hardy shrub of the rocky slopes of Sicily and elsewhere in the Mediterranean region. When the Sumach is cut, it is spread on the field to dry, the leaves are then broken from the stems, packed in bags and conveyed to the mills, and subsequently ground into powder. It is used in dyeing for the production of grey colours, also for tanning the finer kinds of leather. Note the peculiar pruning hook (*ronco*) with which the twigs are gathered and the flail (*bovillo*) with which they are thrashed. There is a large annual import of this product, chiefly from Sicily.

VENETIAN SUMACH or YOUNG FUSTIC consists of the twigs of *Rhus Cotinus*, L., a southern European species. It yields a beautiful bright yellow dye, much used in calico printing. Fruits, leaves, and bark of the NORTH AMERICAN SUMACH (*Rhus glabra*, L.) are here shown. They are astringent and used in America for tanning leather.

**No. 165.** CHIAN TURPENTINE, the oleo-resin of *Pistacia Terebinthus*, L., a bush or small tree; sometimes however, attaining a height of from 20 to 40 feet, common on the islands and shores of the Mediterranean, as well as in Asia Minor. The resinous juice, exclusively obtained from the island of Scio, is yielded after incisions in the bark. Chian turpentine has stimulant and diuretic properties, and was formerly used in medicine for the same purposes as the coniferous turpentines and has also been employed in the treatment of cancer. At the present day it is used for preserving wine, especially when it has to be shipped, for flavouring *Raki*, a cordial largely consumed in the Levant, and to a small extent in medicine. In consequence of the small quantity of this turpentine annually collected, it always realises a high price, and is commonly adulterated, chiefly with coniferous turpentines. The wood, fruits, and oil expressed from the kernels at Scio, together with galls produced on the species, are also shown.



**No. 166. PISTACHIO-NUTS.** Fruits of *Pistacia vera*, L., a small tree of Western Asia and the Levant, now spread far along the shores of the Mediterranean. The kernels possess an agreeable flavour and are eaten either uncooked like dried almonds or made into articles of confectionery.

Observe galls of *Pistacia Khinjuk*, Stocks, and resins of *P. Khinjuk* and *P. mutica*, Fisch. and Mey., var. *cabulica*, small trees of Beluchistan and Cabul. Also galls of *P. atlantica*, Desf., from Palestine and Algeria. The galls of *P. integerrima*, Stewart, a deciduous tree of N.W. India, are sold in the bazaars under the name of KAKRASINGI; they are used for dyeing and tanning and also medicinally. The wood is extremely hard, has a mottled grain, and is used for furniture, carving, &c.

**No. 167. MASTIC.** A resin obtained in the Greek Archipelago, chiefly in Scio, from incisions made in the bark of *Pistacia Lentiscus*, L. Formerly used in medicine in the same way as Chian turpentine. The resin appears in commerce in the form of small tears, and is used in this country in dentistry and in the manufacture of varnishes. Its principal consumption is at Constantinople and in the East, where it is used as a masticatory for sweetening the breath and preserving the teeth and gums. It is also employed in the East for fumigating and in the preparation of confections and cordials.

**QUEBRACHO COLORADO** (*Quebrachia Lorentzii*, Griseb.). A tree abundant in the northern parts of the Argentine Republic, attaining a considerable size. The wood is valuable as a building material as it is practically imperishable when exposed to both air and water. It is of a red colour, hence used to give a claret tint to wine. The bark is used locally and the wood is exported to Europe in considerable and increasing quantities for tanning.

**No. 168. MANGO** (*Mangifera indica*, L.). A large umbrageous tree cultivated very generally in tropical countries, though especially common, under a multitude of varieties, in India. Like all highly cultivated fruits the Mango varies much in size and quality. All the best sorts are grafted. Jamaica Mangoes may be frequently

- CASE 30.** seen in fruiterers' shops in this country. The fruit is most delicious; unripe it is used for tarts, preserves, chutney, &c. Fruits and drawings and various products are exhibited in this case and in Case 31.
- CASE 31.** PIURI, a yellow colouring matter obtained in India from the urine of cows fed upon Mango leaves. It is an article of import into this country.

**No. 169. CASHEW-NUT.** Fruit of *Anacardium occidentale*, L., a tree of Brazil, Central America, and the West Indies, cultivated elsewhere in the Tropics. It is naturalised in many parts of India. The fruit rests on a fleshy edible peduncle from which a spirit is distilled both in Mozambique and in Western India. The fruit when roasted yields a tar employed as a preservative for boats and wood-work. The kernels, sometimes known as Promotion Nuts, after being roasted, are used for dessert and may generally be purchased in this country. The kernels also yield an oil and from the stem a gum exudes which is said to be used by book-binders in South America. Specimens of the products mentioned will be found in the case.

**No. 170. CUDDAPAH ALMONDS.** The kernels of *Buchanania latifolia*, Roxb. They somewhat resemble pistachio nuts, and are largely used in native sweetmeats; a sweet and wholesome oil is extracted from them. The fruit has a sweetish acid flavour, and is eaten by the hill tribes of Central India. The bark is used in tanning.

**No. 171. BURMESE LACQUER or VARNISH TREE** (*Melanorrhoea usitata*, Wall.). Every part of the tree abounds in a thick, viscid, greyish fluid which is collected by making incisions through the bark of the trunk and principal boughs, and inserting joints of Bamboo to receive the fluid as it flows. This forms the famous black varnish or *Thitsi* of the Burmese used for lacquer work, both red and black, examples of which are exhibited, also as size in gilding, and for covering buckets to make them watertight. It has also been used as an anthelmintic. The wood is used for tool-handles, gun-stocks, railway-sleepers, &c.

Observe fruits of the BLOOD PLUM of the Niger CASE  
(*Haematostaphis Barteri*, Hook. f.). They are edible 31.  
and have an acid flavour.

**No. 172.** Wood and gum of *Odina Wodier*, Roxb., a deciduous tree, 40 to 50 feet high. The wood is used for spear-shafts, scabbards, wheel-spokes, oil-presses, rice-pounders, &c.; the tree is pollarded for fodder, especially for elephants. The brittle gum is used for sizing paper by the Nepalese; it is also used for mixing with lime in whitewashing.

**No. 173.** MARKING NUTS, the fruit of *Semecarpus Anacardium*, L. fil., a moderate-sized deciduous tree of the East Indies. The juice of the nut mixed with a little quicklime and water is used all over India for marking linen, and is far more durable than the marking inks of Europe; undiluted it acts as a blister. The bark is used in dyeing.

Note KURAKA NUT (*Corynocarpus laevigata*, Forst.), a New Zealand tree 40 feet high; the fruit is a fleshy drupe an inch long, the pulp is edible, the kernel is poisonous, but is eaten by the Maoris after preliminary roasting and washing in salt water.

Note fruits, oil, and gum, of HOG PLUM or WILD MANGO (*Spondias mangifera*, Willd.), a tree of the dry forests of many parts of India and Burma. The ripe fruit is used as an acid vegetable and pickled. "Deer eat it greedily, and heaps of the hard kernels are found everywhere in the forests where this tree grows."

Fruits of OTAHEITE APPLE (*Spondias dulcis*, Willd.), and of other species of the genus are exhibited in this case.

Observe edible fruits of KAFFIR DATE or PLUM (*Harpephyllum caffrum*, Bernh.), from the Cape.

**Moringa Order** (*Moringae*). A small family of deciduous soft-wooded trees. Natives of Northern Africa, Western Asia, and the East Indies.

**No. 174.** Fruits of the HORSE-RADISH TREE (*Moringa pterygosperma*, Gaertn.), cultivated in the Eastern tropics on account of its leaves, flowers and pods, all of

CASE 31. which are eaten when young. The fruits are also pickled and the seeds yield a clear limpid oil. In India the root is accepted by Europeans as a perfect substitute for horse-radish ; it also used medicinally as a vesicant. The stem affords a reddish gum used in calico-printing and in native medicine.

Observe pods and winged seeds of *Moringa concanensis*, Nimmo, also those of *M. aptera*, Gaertn., the seeds of which are not winged. The latter species is found in Abyssinia, Upper Egypt, Syria, and Arabia, and the seeds are supposed to have yielded true Oil of Ben.

CASE 32. **Connarus Order** (*Connaraceae*). A group of erect or climbing shrubs or trees. Natives of tropical countries.

Note CATTLE-ROPES, made of twisted stems of *Rourea santaloides*, W. and A., and *Connarus monocarpus*, L., used in Ceylon. Also specimens of ZEBRA WOOD, an ornamental hard wood of British Guiana used for inlaying, furnished by *Connarus guianensis*, Lamb. [*Omphalobium Lambertii*, DC.].

**Leguminous Order** (*Leguminosae*). The specimens and products illustrating this great order extend from Case 32 to Case 47. The species number about 6,000 to 7,000. They are herbs, shrubs, or trees, and are widely distributed over the surface of the globe. One division of the order is marked by the curious form of the flower, the petals being unequal in size and disposed in a form which has suggested the name *Papilionaceous*, or butterfly-like. The fruit is commonly a pod (*legume*) more or less resembling that of the Bean or Pea. Many species are natives of Britain (Broom, Whin, Clover, &c.), and large numbers are cultivated, both as important food-plants (Peas, &c.), and for ornament (Acacias, Laburnum, Lupin, &c.). This large order is sub-divided into three sub-orders.

SUB-ORDER I. *Papilionaceae*. On the middle shelf of the first division of this case are samples of leaves of two species of *Cyclopia* used as tea in South Africa, namely *C. genistoides*, Vent., called HONIGTHEE, and *C. subternata*, Vog., CAPE or BUSH TEA, also *Borbonia varviflora*, Lam., known as STEKELTHEE.

Note also roots of WILD INDIGO (*Baptisia tinctoria*, R. Br.), employed in medicine in the United States as an antiseptic in ulcerated sore throats and putrid fevers. CASE 32.

**No. 175.** SUNN or EAST INDIAN HEMP (*Crotalaria juncea*, L.), extensively cultivated in India, more particularly in Mysore and the Deccan, for the sake of its fibre, which by proper treatment becomes soft, fine, and white, bearing comparison with flax. Samples of the stems with the bark beaten out showing the fibre, also of the cleaned fibre, together with fishing lines, cables, nets, sacking and paper stock, and paper made from it are exhibited.

**No. 176.** Seeds of LUPINS. Several species of *Lupinus* (*L. luteus*, L., principally) are largely cultivated on the Continent for the sake of the seeds. They should, however, be regarded with suspicion, as they frequently produce poisonous effects, due to an alkaloid, lupinine, which paralyses the nerve-centres. Lupins are chiefly grown in this country as ornamental garden plants.

Note specimens of yarn sheeting and cloth prepared from fibre, obtained by maceration from the young shoots of GENÉT D'ESPAGNE or SPANISH BROOM (*Spartium junceum*, L.). From Herault, France.

On a lower shelf are specimens of the white wood of the common FURZE (*Ulex europaeus*, L.), together with rough and finished walking sticks made from the stems, and a drinking cup made from the root.

**No. 177.** Baskets and mats made in Madeira of the twigs of the YELLOW BROOM (*Cytisus scoparius*, Link.).

On the bottom shelf of this division are specimens of the dark-coloured hard wood of the LABURNUM (*Laburnum vulgare*, J. Presl.), used for inlaying, turning, &c.

Also seeds of TAGASASTE (*Cytisus proliferus*, L. fil., var. *palmensis*), a small tree common in the mountains of the Canary Islands. The leafy branches form a valuable food for cattle in dry climates and the flowers are said to be much frequented by bees.

**No. 178.** FENUGREEK (*Trigonella Foeniculum-graecum* L.). An annual herb one to two feet high, native of the

**CASE 32.** East, from Greece to Persia, and cultivated largely in the Mediterranean region, Central Europe, Egypt, Abyssinia and India. Fenugreek is used as a fodder plant, but is cultivated more particularly for the seeds, which are extensively employed in veterinary practice, also as an ingredient in curry powder, for mixing with concentrated cattle-foods, and as a condiment for flavouring damaged hay. The seedlings are eaten in Alexandria and Bombay as a green vegetable.

Observe on the middle shelf a mounted series of the singular pods of the genus *Medicago* to which the LUCERNE (*M. sativa*, L.) belongs.

**No. 179.** Samples of RED and WHITE CLOVER SEED (*Trifolium pratense*, L., and *T. repens*, L.) Upwards of 316,000 cwts. of "Clover and Grass" seeds were imported in 1905. Frequently adulterated with old and dead, or kiln-dried seed, and with the cheaper HOBBY CLOVER (*T. procumbens*, L.), &c.

**No. 180.** PRAIRIE TURNIPS, the tuberous roots of *Psoralea esculenta*, Pursh., a native of North West America, where they form a large portion of the food of the native population. The plant was introduced into Europe in 1846 by Lemare-Picquot as a substitute for the Potato. It was cultivated for some time in France under the name of PICQUOTIANE, but the results were not encouraging.

*Psoralea corylifolia*, L., an East Indian species, bears small black pods with dark brown seeds, which have an aromatic and somewhat bitter taste, and are used in the treatment of cutaneous affections by native practitioners. They occasionally come to this country as an oil-seed under the name of BAWCHAN SEED.

Note seeds of white, black, and grey varieties of *Cyamopsis psoralioides*, DC. The plant is cultivated in India not only for its ripe seeds, but as a green vegetable, the pods being eaten like French beans. The dry beans are employed as food for man and cattle.

**No. 181.** INDIGO. Obtained principally from three or four species of *Indigofera* (*I. sumatrana*, Gaertn. *I. Anil*, L., *I. tinctoria*, L., *I. arrecta*, Hochst., &c.)

by soaking the plant in large masses in tanks. After its removal, the water is stirred and beaten with paddles, its colour passes to a blue, and the suspended particles settle to the bottom forming a blue mud, which after the water is drawn off, is dried in the sun and cut into cubes. Of this dye-stuff 8,201 cwts. of the value of £116,902 were imported in 1905, whilst artificially prepared indigo to the extent of 32,246 cwts. of the value of £121,269 were imported during the same period. Specimens are exhibited from Egypt, Nicaragua, Siam, the East and West Indies, also a series of photographs illustrating the industry in India and a model of an Indigo factory placed near the entrance door to this museum. The "blue" of the laundress is prepared from Indigo. Specimens are shown. A colouring matter similar to true indigo is furnished by several other plants as *Polygonum tinctorium*, Lour. (see Case 93), *Lonchocarpus cyanescens*, Benth., *Wrightia tinctoria*, R. Br. (see Case 7), *Strobilanthes flaccidifolius*, Nees, and *Isatis indigoica*, Fort. Owing to the competition of synthetic indigo the area under cultivation in India is stated to have been reduced 66 per cent. during the last ten years.

On an upper shelf of the next division of this case are wood, seeds, &c., of the UMZIBITI tree of South Africa (*Millettia caffra*, Meissn.).

Note also wood of the LOCUST or FALSE ACACIA (*Robinia Pseud-acacia*, L.), a North American tree. Used for posts, treenails, ribs of vessels, turnery, &c. This wood is very durable in contact with the ground.

**No. 182.** KOLILA KAT. Mat made of stems of *Sesbania paludosa*, Prain. Sold in Calcutta. Samples of the fibre and rope made of the same are also exhibited, together with wood and fibre of an allied species, *Sesbania aegyptiaca*, Poir.

Observe pods of CAFÉ DE BRUSCA, or CHILINCHILE (*Sesbania occidentalis*, Poir.), from Magdalena.

**No. 183.** AFGHAN KNIFE enclosed in a sheath bound with bands of the bark of *Caragana decorticans*, Hemsl. It is used for this and similar purposes on account of its bronze-like appearance.

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Observe GUM SARCOCOLLA, ANZERÛT or GÛJAR (*Astragalus Sarcocolla*, Dymock). It is imported into India from the Persian Gulf and is an important ingredient in the preparation of plasters employed by Parsee bone-setters.

**No. 184.** TRAGACANTH. A viscid gum yielded by *Astragalus gummifer*, Lab., *A. eriostylus*, Boiss. and Haussk., *A. adscendens*, Boiss. and Haussk., *A. brachycalyx*, Fisch., *A. microcephalus*, Willd., and other species, natives of mountainous districts in Asia Minor, Persia, Syria, and Greece. They are spiny shrubs, as shown in the mounted specimen of *A. gummifer*, upon which the gum has exuded from cracks in the bark. Tragacanth is not simply the juice of the plant hardened by exposure, "but a more or less complete transformation of the cells of the pith and medullary rays of the stem into a mucilaginous mass. Tragacanth is collected for commercial purposes either from natural exudations or from incisions made in the stems. The first produces the common sorts or small irregular pieces, the second produces Flake Tragacanth, a very fine sample of which is shown, together with vermiform or vermicelli Tragacanth and other sorts. Gum Tragacanth is used in medicine as an emollient and demulcent, also in confectionery, and as a mucilage and for stiffening crape, calico, &c. [Specimens of Tragacanth-yielding species, with information on the mode of collecting the gum are much wanted.]

**No. 185.** LIQUORICE ROOT (*Glycyrrhiza glabra*, L.), cultivated chiefly in Spain, Italy, Asia Minor, Southern Russia, and China, and to some extent in Yorkshire. SPANISH JUICE is the sweet extract evaporated to dryness; made up with gum, gelatine, &c., it forms PIPE-JUICE. Liquorice is used in medicine in lozenges, &c. In England it serves to flavour porter; in France it is made into drinks for the sick. Block Liquorice, known as LIQUORICE PASTE, is largely used in America for soaking tobacco leaves in the form in which they are made up for chewing. The bulk of Liquorice root exported from Smyrna goes to the United States for this purpose.

Turkish Liquorice is not so sweet as that of Spain or Sicily, but keeps better. Specimens of dried roots peeled



and unpeeled as imported, also Solazzi, Corigliano, and other juices, and Pontefract cakes are shown.

Note specimens of MANNA from the CAMEL-THORN (*Alhagi maurorum*, Medic.). A small shrub widely spread from Greece and Egypt through Western Asia and Afghanistan to the plains of North-Western India. The leaves are eaten as fodder by camels. The Manna is collected near Candahar and Herat from the bushes at the period of flowering.

**No. 186.** WEST INDIAN EBONY. Furnished by *Brya Ebenus*, DC., a small tree of Jamaica and Cuba. It takes a beautiful polish, and is used for turnery, inlaying, walking sticks, &c. COCUS WOOD, used for making flutes, flageolets, &c., is supposed to be produced by this plant.

On the bottom shelf of this compartment note specimens of the light wood of the AMBASH or PITH TREE of the Nile (*Herminiera elaphroxylon*, Guill. and Perr.), used by natives as floats in swimming across the river.

**No. 187.** SHOLA (*Aeschynomene aspera*, L.). A marsh plant, growing in the lakes and jheels of India. The wood is extremely light, is a bad conductor of heat, and on this account is used for helmets, and to protect liquids from heat. Helmets, model of an Hindu temple, carved figures, &c., from India are shown.

**No. 188.** GROUND NUTS. Pods and seeds of *Arachis hypogaea*, L., an annual herb. Remarkable from the plant, after flowering, forcing the young pods underground, where they ripen. Extensively grown in warm climates as an important article of food, and for the sake of its oil, which is largely used as a substitute for olive oil, for soap-making, burning in lamps, and by watch-makers, also by perfumers in pomades, cold cream, &c. Its value as an oil seed was first recognised in Europe about 1840. Its native country is somewhat doubtful, but it is probably of American origin.

On the lower shelves are seeds of GRAM or CHICK PEA (*Cicer arietinum*, L.), an annual herb, cultivated from an early period in warm countries, especially in India, where it is used in cakes, curries, &c. It was known to the

**CASE 32.** ancient Egyptians, Hebrews, and Greeks. An acid liquid is obtained by collecting the dew from the plant in the early morning; it contains oxalic, acetic, and perhaps malic acid in solution. The Persian weight "nukhud,"  $\frac{1}{144}$  oz. avoirdupois, is a seed of *Cicer arietinum*.

**No. 189.** Series of seeds and models of pods of the FIELD BEAN, and BROAD or WINDSOR BEAN (*Vicia Faba*, L.), a native of Persia and the borders of the Caspian Sea, now extensively cultivated over the globe. Large quantities of the seeds, both of home growth and imported from Egypt, are used in this country for feeding horses. Cultivated varieties in the green or unripe state form an important vegetable.

**No. 190.** LENTILS. The seeds of *Lens esculenta*, Mœnch., an annual, the native country of which is unknown, though it was cultivated by the Hebrews, and in Europe since the days of the Roman Empire. It is cultivated at the present time throughout the East, in many parts of Europe, North Africa, West Asia, and North-West India. The seeds of the cultivated varieties vary considerably in size and shape, as will be seen from the specimens exhibited. Lentils are used as food, either whole, split, or ground, in the form of Lentil flour. "The foods in common use for invalids, &c., and known under the names of Ervalenta and Revalenta, and generally sold at extravagantly high prices, are essentially composed of lentil meal."

On the bottom shelf of this compartment note seeds of *Lathyrus sativus*, L., extensively cultivated in Southern Europe and eastward as far as the plains of India. In the latter country it is known as JAROSSE or GESSE. In the Mediterranean region the dried peas or seeds are used as food, the pods are eaten green and the whole plant is cut for fodder. In India there are about half a million acres under this crop annually. In spite however of this extensive cultivation the seeds are well known to possess poisonous properties and their continued use by man and animals has led to injurious results.

**CASE 33.** Observe models of varieties of the cultivated PEA (*Pisum sativum*, L.), probably native originally of countries bordering the Black Sea. Presented by Messrs.

Sutton & Sons of Reading. Note also a series of seeds of *Pisum arvense*, L., cultivated in India. CASE  
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**No. 191.** CRAB'S EYES, seeds of *Abrus precatorius*, L., used in India by jewellers and druggists as a weight (*rati*) averaging a little less than 2 grains. They are often strung together for necklaces, rosaries, &c. Under the name of JEQUERITY seeds they were introduced into this country in 1882 for the treatment of ophthalmia. They are said to be occasionally used as an article of food in Egypt; the powdered seeds are harmless when eaten, but rapidly produce fatal results when introduced beneath the skin even in small quantity. They are used criminally in India in "Sui" poisoning, the object being to obtain the skins of the poisoned animals. The poisonous action is due to the presence of *Abrine*, a proteid (hence rendered inert by heat) closely allied to albumen in composition, and obtainable from the roots and stem as well as from the seeds. The roots are said to be employed in India as a substitute for Liquorice, and the bark is twisted into a coarse cordage.

**No. 192.** SOY BEANS (*Glycine hispida*, Maxim.). An annual, cultivated largely in China, Japan, and India. In the two former countries a sauce known as Soy is produced in large quantities and in Japan a kind of cheese or curd cake is prepared known as "Natto."

The chief products of Manchuria are bean oil and bean cake. The seeds yield 17 per cent. of an edible oil obtained by expression, and the residue is made into large circular cakes, weighing about 60 lbs., similar to that exhibited, used in the East for feeding cattle and also as manure. Soy is imported into Europe in barrels and is said to form the basis of most of the popular sauces.

Observe on the middle shelf tubers of *Erythrina acanthocarpa*, E. Mey., from South Africa. These are extremely light and are used for making hats, &c., a specimen of which is exhibited.

On a lower shelf are tubers of *Apios tuberosa*, Moench., a climbing plant of North America; they are farinaceous, and edible when cooked.

**CASE 33.** **No. 193.** COWHAGE or COW-ITCH (*Mucuna pruriens*, DC.). A woody twiner, common in India, cultivated or partially wild throughout the tropics of both hemispheres. The pods, about 4 inches long and  $\frac{1}{2}$  inch wide, slightly curved at each end, are densely covered with stiff brown hairs, which readily separate from the pods, and, penetrating the skin, produce an intolerable itching. They are used in medicine as a mechanical anthelmintic, in syrup, honey, or treacle, but not so much as formerly. Cowhage is imported into Europe from Bombay and the West Indies for the supposed preparation of some patent vermifuge. The young pods are eaten as a vegetable and the root has diuretic properties.

Pods of several other species of *Mucuna* are shown from the East Indies, Brazil, Africa, &c., all more or less coated with strong penetrating hairs. The seeds are sometimes drifted across the Atlantic by the Gulf Stream from the West Indian Islands to the Azores, Irish, Scotch, and Norwegian coasts, where they are occasionally picked up. The seeds of *Mucuna capitata*, W.&A., are used in India as a weight (*Massa*) = 8 rati or about 16 grs.

**No. 194.** BENGAL KINO (*Butea frondosa*, Roxb.). The resin exuded either naturally or from incisions in the bark of an erect tree common throughout the plains of India, Burma and Ceylon, where it is stated to thrive on salt lands and in water-logged places. The resin has no smell, but a strong astringent taste, for which reason it is employed in medicine. The seeds are used as a vermifuge in India, and from them MÚDÚGA oil is obtained.

The flowers (TISSOO or PULAS) are used for dyeing yellow and orange red. The inner bark yields a fibre for cordage and caulking the seams of boats, and a lac is produced on the twigs by the puncture of a *Coccus*. Samples of the various products mentioned are shown.

**CASE 34.** On an upper shelf of the first division of this case observe portion of stem, and the yam-like tubers of *Pueraria tuberosa*, DC., the latter are said to form an article of food in the Punjab.

**No. 195.** KO of China, KUZA of Japan (*Pueraria thunbergiana*, Benth.). A large woody climber of China,

Japan, Formosa, &c. From the stems fibre is obtained especially at Kiukiang, in Corea, &c. Note cloth from Corea, China and Japan made from it. It is said to be the oldest textile material in China, cloth made from this fibre having been in use 1,000 years B. C. In Japan it was formerly largely used in the manufacture of summer clothing, not getting limp, nor clinging when wetted, like cotton, and soon drying. Kuza fibre was only used for the woof, the warp being silk, flax, hemp or cotton. It was stiffened with starch made from the root (a sample of which is shown). It is now nearly superseded by Hufu or paper cloth, made from KOZU, the fibre of *Broussonetia papyrifera*, Vent. (see Case 111.). Note on lower shelves of this compartment mounted pods and seeds of *Canavalia obtusifolia*, DC., BAY BEAN of Bermuda; a common shore plant in nearly all warm countries, the seeds of which germinate after long immersion in seawater; and *C. ensiformis*, DC., OVERLOOK BEAN of the West Indies. The former species has bright red seeds whilst the latter are marbled or mottled and the pods scimitar shaped. The young tender pods and seeds of *C. ensiformis* are eaten in India.

**No. 196.** ORDEAL BEANS of Old Calabar (*Physostigma venenosum*, Balf.), a large perennial climber found only near the mouth of the Niger and Old Calabar, West Tropical Africa, and even in these localities it is said to be somewhat rare in consequence of the plants having been destroyed by order of the Government. Formerly these beans were used in the neighbourhood of Old Calabar as an ordeal. They are imported into this country from Western Africa for medicinal purposes, being used in ophthalmic diseases, tetanus, epilepsy and other nervous affections. In commerce the seeds of *P. cylindrospermum*, Holmes, are sometimes mixed with those of the true Calabar bean.

Observe also a series of seeds of MOTH (*Phaseolus aconitifolius*, Jacq.), widely cultivated in India as a hot-weather crop. It yields a valuable fodder and the grain is employed as a food for horses and oxen.

**No. 197.** A large series of seeds of GREEN GRAM or MUNG of India (*Phaseolus Mungo*, L.), largely cultivated

**CASE** under various forms as a food crop. Flour and cakes made from it are also shown. The seeds of *P. Mungo*, var. *radiatus*, are used in India, under the name of **Urd grains**, each equalling a quarter of a rati or about half a grain.

Note also a fine series of seeds of **SCARLET RUNNER BEANS** (*Phaseolus multiflorus*, Willd.), and of **FRENCH BEANS** (*P. vulgaris*, L.), and models of their pods from Messrs. Sutton and Sons, of Reading.

**No. 198.** Meal of the **SUGAR** or **LIMA BEAN** (*Phaseolus lunatus*, L.) from Jamaica. There are two varieties, one with white, the other with purple variegated seeds; the latter are esteemed poisonous in Mauritius owing to their producing, like Bitter Almonds, prussic acid when macerated in water. This would be dissipated in cooking, and they would then be wholesome.

**No. 199.** Numerous specimens showing the great variety in the seeds of **CHOWLEE** of India (*Vigna Catiang*, Walp.), a plant perhaps originally Malayan, very extensively cultivated in India and the tropics of the Old World for the seeds which are used as food. The leaves are said to be used as a dye in Bengal, and in China, where the plant is known as **TOW COK** they are mixed with Indigo in dyeing native cloth blue. A black-eyed variety is grown in Southern Europe under the name of **FAGGIOLA DEL OCCHIO**.

On a lower shelf are seeds of the **BAMBARRA GROUND NUT** (*Voandzeia subterranea*, Thouars), a creeping annual of Madagascar and Tropical Africa. The pods are matured underground like those of *Arachis hypogaea* (No. 188). The seeds are largely eaten in Tropical Africa as also in Brazil where they have been introduced by negro slaves. They are imported into Western India from Mozambique under the name of **MOZAMBIQUE GRAM**.

**No. 200.** **YAM BEAN** (*Pachyrhizus tuberosus*, Spreng.). A native of Tropical South America, and cultivated in the West Indies. The young pods are cooked and eaten like French beans, and the tubers also form an excellent vegetable. A flour of very good quality

may also be obtained by slicing the tubers drying them in the sun and then reducing them to powder. The raw seeds are said to be poisonous, but wholesome when cooked. CASE  
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Pods of an allied species *P. angulatus*, Rich., from plants grown in the Botanic Garden, Ceylon, are also shown. It is probably of Central American origin, but is now widely cultivated in the tropics of both hemispheres. The young tubers are eaten like those of *P. tuberosus*, and a starch is also obtained from them.

**No. 201.** A series of seeds of WALL or SHIM (*Dolichos Lablab*, L.), a climbing perennial, or under cultivation an annual, common in India where the seeds, which vary much in form and colour, are employed as food. The fresh stems are used as fodder. CASE  
35.

On the middle shelf are seeds of the HORSE GRAM (*Dolichos biflorus*, L.), used as food by the poorer classes in India and also for feeding cattle. The stems are employed as fodder.

On the shelves below are numerous specimens of seeds of the PIGEON PEA or DAL (*Cajanus indicus*, Spreng.), an erect shrub, widely distributed in the tropics. Numerous varieties are cultivated as food; the seeds vary exceedingly in shape, size, and colour, as will be seen from the specimens exhibited.

Note the pretty blue seeds of *Rhynchosia cyanosperma*, Benth., from the River Niger. They are known as DAMABO on the Gold Coast, and are used for weighing gold dust. CASE  
36.

Observe WARAS a substitute for Kamala (see Case 108); it consists of the epidermic glands of the young pods of *Flemingia congesta*, Roxb., a native of Tropical Asia and also of *F. grahamiana*, W. & A., a Nilgiri shrub.

Wood of the SISSOO of India (*Dalbergia Sissoo*, Roxb.), a dark-coloured, even-grained hard wood, highly valued for furniture and for carving; also employed for boat building, gun carriages, wheelwrights' work, &c.

**No. 202.** ROSEWOOD. Specimens from Brazil and Central America. The best Brazilian Rosewoods, exported from Rio, are afforded by a species of *Dalbergia*. [Little is known of the trees furnishing the different

CASE 36. varieties of this valuable cabinet-wood, and authentic specimens of flower and fruit, from the timber-producing trees, with sections of the wood, are much wanted.]

On the bottom shelf of this compartment are specimens of the hard and heavy wood of *Dalbergia melanoxyton*, Guill. and Perr., used in Tropical Africa for furniture, &c. Note a native comb of this wood from East Tropical Africa.

**No. 203.** BLACKWOOD or ROSEWOOD of Southern India (*Dalbergia latifolia*, Roxb.), a large deciduous tree widely distributed in India. The wood is extremely hard, and of a dark colour, and is very valuable for furniture, carving, fancy work, as also for cart-wheels, gun carriages, &c. Note model of the Kootub of Delhi, carved in Blackwood. Also picture frame, book-rest, cups and other articles.

Observe PAITAN or WHITE CHANDAN WOOD (*Dalbergia hupeana*, Hance), and pulley and model of a Chinese Orderly carved in the wood. From the Ningpo District, China.

A series showing the variety in structure of the fruit obtaining in the group of *Dalbergieae* arranged by the late George Bentham, Esq., is exhibited on an adjoining wall.

Observe curious winged pods of *Centrolobium paraense*, Tul., also specimens of BARWOOD, a well-known red dye-wood from West Tropical Africa probably furnished by *Pterocarpus Soyauxii*, Taub.

**No. 204.** BASTARD TEAK (*Pterocarpus Marsupium*, Roxb.), a large deciduous tree of the forests of Central and Southern India. The dark brown wood takes a fine polish, and is much used in India for furniture, carpentry-work, boat-building, &c. From incisions made in the trunk of this tree KINO is obtained (**No. 205**); as it exudes it has the appearance of red currant jelly, hardening upon exposure to the air. It has astringent properties, and is used in medicine on that account. There is a considerable demand for this product for export, much of it going to France. Over the window near this case is a portion of a stem which has been deeply gashed to obtain Kino.



**No. 206.** RED SANDERS or CALLIATURE WOOD CASE  
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(*Pterocarpus santalinus*, L.), affording a reddish-brown dye, used for woollen cloths. It is also said to be used for colouring wine. The tree grows to a height of about 20 to 25 feet, occupying only a small area in Southern India, more particularly in the Cuddapah District. The wood is also extensively used for carved work. Note a carving of the God of Wisdom, Ganesha, in this wood from Madras.

On the lower shelves note ANDAMAN REDWOOD or ANDAMAN PADAUK (*Pterocarpus dalbergioides*, Roxb.). A very large tree of the Andaman forests. The wood is hard, close-grained, of a deep red colour and durable, and is largely exported to Europe and America for furniture, railway-carriages, balustrades, &c. Note also wood and gum of PADAUK of Burma (*P. macrocarpus*, Kurz.). The wood is harder and heavier than the Padauk of the Andamans, and is probably not used outside Burma.

**No. 207.** AFRICAN ROSEWOOD (*Pterocarpus erinaceus*, Poir.), from the Gambia. BOIS ROUGE or SANTAL ROUGE of Gabon. This species affords AFRICAN KINO of commerce, specimens of which are exhibited; it was the original source of the drug which derives its name from Kano, which the tree was called in the Mandingo language.

Note sample of wood, and small box of AMBOYNA WOOD, a beautiful ornamental wood, said to be imported from Singapore, and supposed to be furnished by a species of *Pterocarpus*. It is sometimes known as KIA-BOCCA WOOD.

Observe on the middle shelf of the first compartment of this case YORUBA INDIGO from *Lonchocarpus cyanescens*, Bth., also yarns dyed with it from Sierra Leone. Note also cordage made from fibre of *Derris uliginosa*, Bth., from Ceylon, and TOOBA roots (*Derris elliptica*, Bth.), from Singapore, where they are used as a fish poison. CASE  
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Wood, fruits, and oil of *Pongamia glabra*, Vent., are here exhibited. The pods and leaves are used in native medicine in India, and the oil expressed from the seeds is also used both medicinally and for burning.

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On the bottom shelf are fine specimens of the wood and bark of the WHITE DOGWOOD of Jamaica (*Piscidia Erythrina*, L.). The powdered leaves and twigs are used to poison fish; the root bark is used in the United States as a narcotic.

On an upper shelf of the next compartment note fruits and bark of MACAYO of Mexico (*Andira excelsa*, H.B. and K.). The bark is used for tanning.

Near these are specimens of ARARоба or GOA POWDER afforded by a Brazilian tree described under the name *Andira Araroba*, Aguiar. Specimens of the plant in the Kew Herbarium agree more nearly with the genus *Tipuana*, therefore it is greatly to be desired that specimens of the Goa powder plant, together with the fruits should be forwarded to Kew for determination. GOA powder is extensively used in India and in other tropical countries, where coolie labour is employed, for the treatment of ring-worm and other cutaneous affections. Also CABBAGE TREE BARK of Jamaica (*Andira inermis*, H.B. and K.), used in the West Indies as an anthelmintic. Fruits and wood of this species are also shown.

Note walking sticks and ruler of PARTRIDGE WOOD, believed to be furnished by a species of *Andira*. The wood is imported from Brazil, and is also employed for cabinet-making, turnery, &c.

CANARAN or BASTARD TONQUIN seed (*Geoffroea*, sp. near *G. superba*, H. & B.), imported from Brazil.

On the middle shelf, note pods, seeds, and oil of *Dipteryx oleifera*, Bth., known as the EBOR tree of the Mosquito shore. The fruits and seeds are very similar to those of *D. odorata*, but are entirely devoid of fragrance. A large quantity of fatty oil is obtained from the seeds, used by the natives as a hair oil, and said to be used in the composition of Macassar oil.

**No. 208.** TONQUIN BEANS (*Dipteryx odorata*, Willd.), from Guiana. They are very fragrant, with the odour of new-mown hay, and are largely used by perfumers for bouquets, and in the preparation of sachet powders. The tree grows to a large size and produces a hard wood, sections of which are shown.

On a lower shelf observe specimens of CAMWOOD produced by *Baphia nitida*, Lodd., a West African shrub

8 or 10 feet high. The heart-wood is imported for dyeing a deep red colour. CASE  
37.

On the upper shelf of the next compartment note pods, seeds, and wood of FRIGOLITO (*Sophora secundiflora*, Lag.), of New Mexico. The seeds contain an exceedingly poisonous alkaloid, known as Sopheria, and the Indians in the neighbourhood of San Antonio use them as an intoxicant, half a bean producing exhilaration, followed by sleep lasting two or three days, and a whole bean being sufficient to kill a man.

Note also section of the wood of *Sophora japonica*, L., a well-known ornamental tree of China. Also WAI-FA, flower buds of the same species, used by the Chinese for dyeing yellow, or rather for rendering blue cottons and silks green.

On a lower shelf observe pods of the MORETON BAY CHESTNUT or BEAN TREE (*Castanospermum australe*, A. Cunn.). The seeds are steeped in water for several days, dried and roasted, then ground into a coarse meal, which is made into cakes and used as food by the aborigines. The wood has been recommended for cabinet work.

Note also the bright red seeds, with a black blotch, of several species of *Ormosia*.

**No. 209.** BALSAM OF TOLU, furnished by *Myroxylon Toluifera*, H.B. and K. The tree, which grows to a height of 80 feet, is often unbranched for a distance of 40 to 60 feet from the ground. It is a native of Venezuela and Colombia, where the balsam is collected by making V-shaped incisions through the bark to the wood of the growing tree, and inserting cups made of calabashes, as shown in the specimen exhibited. The balsam is finally put into cylindrical tins for exportation to Europe. Balsam of Tolu is used in medicine as an expectorant and stimulant. Tolu lozenges are well known as a remedy for allaying coughs. CASE  
38.

**No. 210.** BALSAM OF PERU, yielded by *Myroxylon Pereirae*, Klotzsch, a spreading tree about 50 feet high, found in woods on the Sonsonate Coast, San Salvador, Central America. To collect the balsam the bark is beaten and removed, heat is then applied with a torch to

CASE 38. the bared portion of the trunk, which is covered with cloths. These when saturated with balsam are boiled in water for some time, the cloths being finally wrung in a rope press, such as is exhibited. By this means very little of the balsam is wasted. When it is cooled the water is poured off, and the balsam transferred to the canisters for exportation. One of these canisters is shown, together with two earthenware jars, such as were formerly used for the purpose. Balsam of Peru is used in perfumery, in the manufacture of soap, and to a slight extent in medicine, in cases of bronchitis, asthma, &c. Fruits and wood of the tree are also shown.

SUB-ORDER II. *Caesalpinieae*. On an upper shelf of the next compartment of this case are seeds of the CHIGA (*Campsiandra comosa*, Bth.), and starch obtained from them from the Upper Orinoco, where the flour or starch is used for making bread and tarts.

Note samples of PEACH WOOD, BRAZIL WOOD, and LIMA WOOD, dye woods usually attributed to *Caesalpinia echinata*, Lam. The sources of these woods are, however, not satisfactorily known. Authentic specimens of leaves and flowers would be valuable. [BRAZILETTO wood is the product of *Peltophorum Linnaei*, Bth. (*Caesalpinia brasiliensis*, L.), native of Jamaica and some other West Indian Islands, but not of Brazil.]

On the lower shelves are pods of several species of *Caesalpinia* from South America, East Indies, &c., the more important being TARRA (*C. tinctoria*, Domb.), used in Lima for making ink. Pods and leaves of BARBADOS PRIDE (*C. pulcherrima*, Sw.) used in the East Indies as a substitute for Senna. Pods of TEREË, TERI, or TOWRI (*C. digyna*, Rottl.) from Assam, used for tanning. Also pods, entire and pounded—showing the amount of resin contained in them—of *C. brevifolia*, Baill. (*Balsamocarpum brevifolium*, Clos.), from Santiago, likewise used for tanning and known as ALGARROBO.

No. 211. DIVI DIVI pods (*Caesalpinia coriaria*, Willd.). A powerful astringent imported from the East and West Indies and South America for the use of tanners. Specimens are exhibited from Maracaibo, Savanilla, and other parts, also leather tanned with the pods.

**No. 212.** Pods and seeds of *Caesalpinia Bonducella*, FLEM., a common climbing shrub on tropical shores. SEEDS ARE EXHIBITED THAT HAVE BEEN WASHED UP ON THE SHORES OF KAFFRARIA, TRISTAN D'ACUNHA, AND ST. HELENA; they are also occasionally washed up on the Irish, Scotch, and Norwegian coasts. CASE  
38.

The seeds, known as NICKER NUTS, are used in India in medicine. Their principal use, however, is for making into bracelets, necklaces, rosaries, &c. They are of a slate colour. An allied species is *C. Bonduc*, Roxb., the seeds of which are of a yellow colour, as may be seen from the specimens.

**No. 213.** SAPPAN WOOD (*Caesalpinia Sappan*, L.). A red dye-wood, furnished by an East Indian tree growing to a height of 30 or 40 feet. It is imported from India, Siam, and Ceylon.

**No. 214.** LOGWOOD. The heart wood of *Haematoxylon campechianum*, L., a small spreading tree of Central America introduced into Jamaica in 1715, and now naturalised. The wood is imported in logs, which are cut up into chips and ground for the use of dyers and printers. Esteemed as one of the best deep-red and black dyes. Medicinally Logwood is a mild astringent. CASE  
39.

Note wood and pods of the KENTUCKY COFFEE TREE (*Gymnocladus canadensis*, Lam.). The wood is occasionally used in America for cabinet-work, posts, rails, &c., and the roasted seeds were formerly employed as a substitute for coffee. The fresh leaves macerated and sweetened are sometimes used as a poison for house flies, its action is said to resemble that of the Calabar Bean (see No. 196).

Observe a mounted specimen with pod of *Gymnocladus chinensis*, Baill. From the pods a soapy substance is obtained, used by the Chinese for washing purposes. They are steeped for two days in water, and the liquid resulting is used as soft soap, or it can be dried into hard soap. Note also pods of *Gleditschia sinensis*, Lam. The ashes of these are used by the Chinese to restore animation in partially drowned persons, and the pods themselves are used as soap. On the top of the case is a section of the remarkable spiny stem of this species.

**CASE 39.** Wood and pods of the HONEY LOCUST of North America (*Gleditsia triacanthos*, L.), are also shown, as well as pods of *Wagatea spicata*, Dalz., a robust prickly climber of Western India, which contain a large percentage of tannin.

In the next compartment of this case are various products of the genus *Cassia*. On an upper shelf are specimens of the wood of *Cassia siamea*, Lam., a moderate-sized tree of India, Ceylon, the Malay Peninsula, and Siam; the heartwood is dark brown, and often beautifully marked. It is used in Burma for walking sticks, mallets, &c.

NEGRO COFFEE, the seeds of *Cassia occidentalis*, L., naturalised in Tropical Africa, where they are used, as well as in Central America and the West Indies, as a substitute for coffee.

**No. 215.** Pods, seeds, and bark, of the TANNER'S CASSIA (*Cassia auriculata*, L.), a shrub common in Central and Southern India. The bark is one of the most valuable of Indian tans, and the wood is converted into native tooth brushes. The root is employed in tempering iron and steel. In the South of Ceylon, it is known as the MATURA TEA plant, its leaves being infused as a substitute for tea.

On the lower shelves are pods and seeds of *Cassia Tora*, L., an annual weed widely spread in India and the tropics generally. The seeds yield a yellow dye and are employed in India in the treatment of cutaneous affections. Also pods and seeds of *C. Sophera*, L., a species which contains chrysophanic acid. Note also the woody pods of *C. grandis*, L., the produce of a tree of Brazil.

**No. 216.** Pods of the PURGING CASSIA (*Cassia Fistula*, L.), an ornamental tree, 30 to 50 feet high, bearing numerous racemes of bright yellow flowers. It is a native of Tropical Asia, and is frequently planted in the West Indies, Central America, Brazil, &c. The pods, are pendulous, often 2 feet long, cylindric, and when ripe, of a dark purplish brown. They contain a large number of small seeds, each embedded in pulp, of a blackish-brown colour, which has a sweetish taste, and is

used in medicine as a mild laxative. They are imported from the East and West Indies, but chiefly from the latter. Wood, bark and gum of this species are also shown. The bark is in considerable demand in some parts of India for tanning purposes. CASE  
39.

Observe specimens of AMERICAN SENNA, the leaflets of *Cassia marylandica*, L., a perennial herb, 3 or 4 feet high, common on low sandy ground throughout the United States. American Senna is usually found in commerce in compressed, oblong cakes, often containing leaflets, petioles and flowers.

**No. 217.** ALEXANDRIAN or NUBIAN SENNA (*Cassia acutifolia*, Delile). A shrub about 2 feet high, native principally of Nubia, Sennaar, and Kordofan. This kind of senna is imported in large bales from Alexandria, hence its name. It is sometimes adulterated with ARGEL leaves (*Solenostemma Argel*, Hayne). [See case 78.]

**No. 218.** ARABIAN or TINNIVELLY SENNA (*Cassia angustifolia*, Vahl). A small shrub of Southern Arabia, Somali Land, Scinde, and the Punjab. The leaflets when gathered and dried form part of the senna of commerce, known as Arabian, Mocha, Bombay, or East Indian Senna. These sorts are exported from Mocha, Aden and other ports of the Red Sea to Bombay, from whence they are re-exported to Europe and America. They are regarded in commerce as of inferior quality in consequence of their being carelessly dried and often mixed with portions of legumes, stalks and flowers. All the Sennas are purgative. The kind known as Tinnivelly Senna is furnished by the same plant grown in Southern India, and on account of its more luxuriant growth and careful preparation, is considered in commerce as a fine kind. The best Senna, however, is that afforded by *C. acutifolia*.

Observe also specimens of ITALIAN, TRIPOLI, or JAMAICA SENNA (*C. obovata*, Collad.), the first kind known to botanists, a shrubby perennial found in Egypt, Nubia, Abyssinia and Tripoli. Cultivated in Italy in the first half of the 16th century, and now naturalised in Jamaica.

**No. 219.** CAROB, ST. JOHN'S BREAD or LOCUST CASE BEAN, the pods of *Ceratonia Siliqua*, L., a branching CASE  
40.

**CASE 40.** tree about 30 feet high, native of the Mediterranean coast. It is cultivated for the sake of the pods which contain a quantity of saccharine pulp, and are used in Southern Europe for feeding horses, mules, pigs, and even for human beings in times of scarcity. Large quantities are imported into this country and form one of the ingredients of concentrated cattle foods. The small seeds are said to have been the original carat weight of the jewellers. The knotted branches when straightened make excellent walking sticks, for which purpose they were at one time imported in large quantities; specimens are shown, as well as the wood itself.

On the lower shelves observe various specimens of the woods, pods, barks and fibres, and cordage made from the fibres of various species of *Bauhinia*. The Indian species represented are *B. racemosa*, Lam., *B. variegata*, L., *B. retusa*, Ham., *B. racemosa*, Lam., and *B. malabarica*, Roxb.

**No. 220.** RAIN CAPS (Ghooms) made of leaves of *Bauhinia Vahlia*, W. & A.; also platters, and bellows used for smelting iron by native smiths in Central India.

Observe in the last compartment of this case stems of species of *Bauhinia*, showing a remarkable mode of growth, being flattened and corrugated in the middle; they are termed "Land-turtles Ladders." Also sections of stems showing anomalous structure, and pods of unnamed species of *Bauhinia*, *Macrolobium*, and allied genera. Sections of the trunk of the JUDAS TREE (*Cercis Siliquastrum*, L.) are also shown.

**CASE 41.** **No. 221.** JURUPARI, sent by Mr. Spruce from the Uaupés, a branch of the Amazon, where they are used on the occasion of certain superstitious rites as musical instruments. They are wrapped up in the folds of *Eperua grandiflora*, Bth.

On the middle shelf of this compartment are woods, pods, seeds &c. of the WALLABA of British Guiana (*Eperua falcata*, Aubl.). The wood is used for shingles and vat staves. Note also Gum and Frankincense from the BUNGO TREE of Sierra Leone (*Daniella thurifera* Benn.), and OGEA GUM and wood from West Tropical



Africa believed to be derived from one or more species of *Cyanothyrus* so far undetermined.

**No. 222.** WAR CLUBS from the Fiji Islands made of the dense hard wood of *Afzelia bijuga*, A. Gray. A native pillow, cannibal fork and dish, kava bowl, spear (over the case), and other articles made of the wood from the Pacific Islands.

**No. 223.** TAMARINDS. The pulp of the pods of *Tamarindus indica*, L., imported from India and the West Indian Islands. That from India is usually in the form of a clammy dark mass, consisting of the pulp and seeds, whilst that from the West Indies is of a lighter colour, and generally preserved in sugar syrup. The name Tamarind appears to be derived from the Arabic Tamar-Hindi (Indian Date). The tree grows to a height of 60 to 80 feet, with a wide spreading head of dense foliage. It is now found in all tropical countries, but Africa is, in all probability, its country of origin. Cultivated chiefly for its fruits, in warm countries it is often grown as a shade tree, or for the fragrance of its flowers. Tamarinds have laxative properties and an agreeable acid taste, and in hot countries are used to make cooling drinks. Dried fruits, gum and wood are shown. The latter is very heavy and sinks in water; a table made of it is exhibited in Museum No. III.

**No. 224.** Wood of WEST INDIAN LOCUST TREE, SIMIRI of BRITISH GUIANA (*Hymenaea Courbaril*, L.), tough and close-grained, valuable for treenails and timber of steam-engines. Some of the Brazilian Locust trees, according to Von Martius, attain a size so great that 15 Indians with outstretched arms could just embrace one of them. A resin resembling Anime exudes from the trunk and is found in lumps at the bases of old trees. It is used for varnish making. Samples of the resin as well as of the woody pods are shown.

**No. 225.** METATE or TROUGH made of the wood of *Hymenaea Courbaril*, L. Used by the Caribs for rubbing down flour for making cakes. It was found in a Carib cave in Dominica, and is of great antiquity. On the top of Case No. 36 is a native canoe made of the bark of the tree.

**CASE 42. No. 226.** COPAL or ANIME, various commercial varieties. The produce principally of *Trachylobium hornemannianum*, Heyne, a tree of Zanzibar. The best Anime is that which is dug from the ground near the roots of trees, or where the trees once stood, and is in a semi-fossil state. Specimens of recent Copal attached to the bark of the tree are exhibited, also fruits of the Copal tree. Specimens of the flower and fruit of other Copal trees are much desired. *T. verrucosum*, Oliv., of Madagascar is a closely allied species.

Note on an upper shelf of the next division of this case a section of the trunk with Copal exuding, of an undetermined species of *Trachylobium*, together with another sample of the copal, from the Congo.

Observe also fruits of the DATTOCK of the Gambia (*Detarium senegalense*, Gmel.). The edible pulp is prized by the negroes.

**No. 227.** BALSAM of COPAIBA. An oleo-resin obtained by making incisions in the trunks of several species of *Copaifera*, the principal of which is *C. Lansdorffii*, Desf., a tree widely distributed in Brazil, varying in height from that of a shrub to 60 feet. The other species which yield Balsam of Copaiba are *C. officinalis*, L., a native of Venezuela, Trinidad and Central America; *C. Martii*, Hayne, of British Guiana and North Brazil; *C. guyanensis*, Desf., of the same localities, and probably some other species. The balsam as it flows from the trees is very thin and colourless, but soon becomes thicker and assumes a yellow tint. It is imported from Maracaibo, Rio Janeiro, Demerara, Carthagena, and some of the West Indian Islands, and reaches this country often by way of Havre or New York. A specimen of the stem of a species of *Copaifera* is exhibited showing the balsam exuding.

**No. 228.** PURPLE HEART, the wood of *Copaifera pubiflora*, Benth. A large timber tree of British Guiana, where the wood, which is of a beautiful purple colour when freshly cut, is used for structural purposes on account of its great strength and durability.

On the lower shelves are various specimens of African Copal:—LISBON COPAL, recent and fossil; PEBBLY COPAL; a fine mass of ACCRA, and another sample from

the Gold Coast ; and BENGUELA ; all probably furnished by species of *Copaifera*. Specimens are also exhibited of the SIERRA LEONE COPAL (*Copaifera guibourtiana*, Bth.). INHAMBANE COPAL is produced by *Copaifera gorskiana*, Bth. CASE  
42.

In the last compartment of this case are sections of the hard wood of ANJAN (*Hardwickia binata*, Roxb.), a large deciduous Indian tree. The wood is extremely durable, and is employed in India for bridge and house posts and ornamental work. Note also rope made from the bark, and resin yielded by the tree. The tree is much pollarded for fodder and manure. Samples of resin and oleo-resin from *H. pinnata*, Roxb., are also shown.

**No. 229.** Wood, pods and bark of MORA (*Dimorphandra Mora*, Bth.). A tree 100 to 150 feet high, and frequently unbranched for nearly half the height ; native of British Guiana. The trunk is often from 2 to 2½ feet in diameter. The wood is extremely hard and durable, and considered first-class for shipbuilding ; it does not, however, resist the Tereido, as a specimen in the case will show. A large square trunk of Mora wood is exhibited in Museum No. III., British Guiana Coll. No. 13b. The seeds, which are very large, are eaten by the natives in times of scarcity.

Observe embryos, in spirit, of *Dimorphandra oleifera*, Triana, from Rio Grande, Panama. One measures 14 inches round and 6½ inches in the widest part. This is probably the largest embryo in the vegetable kingdom.

**No. 230.** SASSY BARK of Sierra Leone (*Erythrophileum guineense*, G. Don). A tree 40 to 100 feet high, native of tropical Africa. The bark is a powerful poison, and is used by the native tribes as an ordeal (called CASCA on Lower Congo, used merely as a strong emetic "to bring up the devil"; MWAVI in Makua country). A red juice flows from the tree, which is used for the same purpose. CASE  
43.

**SUB-ORDER III. Mimoseae.** On the middle shelf of this compartment are shown pods and seeds of the OWALA or OPOCHALA of West Africa (*Pentaclethra macrophylla*, Bth.). The pods are very thick and woody

CASE and the valves powerfully hygroscopic. The seeds are  
43. edible and contain 45 per cent. of oil or fat suitable for  
candle and soap-making, and 30 per cent. of albuminoids,  
suitable, after the expression of the oil, for cattle food.

On the lower shelves are pods, &c., of various species  
of *Parkia*, of which note CAFÉ DE SOUDAN, the seeds of  
*Parkia africana*, R. Br., which, when roasted are used as  
a substitute for coffee and chocolate; the tree was long  
supposed to be identical with Cola (*see* p. 29).

**No. 231.** Pods of CACCOON, MACKAY BEAN, SEA  
BEAN (*Entada scandens*, Bth.). A large woody climber,  
widely distributed in the tropics. Some of the legumes  
measure 4 feet in length by 4 or 5 inches in breadth.  
The seeds are about 2 inches across, dark brown, hard and  
shining, and are often made into spoons or small boxes,  
and are used for crimping linen. They are also eaten by  
natives in North Queensland after baking, pounding and  
steeping in water in a dilly bag for 12 hours. This  
process is probably necessary on account of the presence  
of saponin which is to some extent poisonous. These  
seeds are frequently washed up on shores distant from  
the place of growth; specimens are exhibited that have  
been so washed up on the coasts of Western Europe and  
Africa, from the tropics to the North Cape. Observe the  
curiously twisted stem of this plant, also fibre and rope  
prepared from it. Under the name of SINTOH or GOGO  
the stem is beaten out, dried and used in place of soap in  
Perak.

**No. 232.** NIOPE SNUFF, made from the pods of  
*Piptadenia peregrina*, Bth., by the Indian tribes of the  
Rio Negro, Brazil, with the instruments used in its pre-  
paration. The pods are also shown.

On an upper shelf of the next compartment observe  
sample of ANGICO gum from *Piptadenia macrocarpa*,  
Bth., introduced into London from Brazil in 1888 under  
the name of BRAZILIAN GUM ARABIC. Specimens of  
the wood and bark are shown. Note also bark of  
BARBATIMAO (*Stryphnodendron Barbatimam*, Mart.),  
from Brazil. It has astringent properties and is used for  
tanning.

**No. 233.** RED WOOD, or sometimes called RED SANDAL WOOD (*Adenanthera pavonina*, L.). A deciduous tree of India, Malay Islands, China and the Philippines. The heart-wood is red, hard, and close-grained, and is used in South India for house-building, cabinet purposes, and as a red dye. The seeds are worn as necklaces by the women and children, and are used as weights by goldsmiths and jewellers, weighing on an average four grains each. They also yield an oil. CASE  
43.

Note roots of *Elephantorrhiza Burchellii*, Bth., known as ELANDS BONTJES, occasionally imported into this country from Natal for tanning purposes; note also the curious pods of *Tetrapleura Thonningii*, Bth., from West Africa, remarkable for the strong ridge down the back of each valve. They contain saponine and are sold in the markets of Sierra Leone for washing purposes and are also occasionally imported into this country as a soap substitute.

On a lower shelf observe wood of the MESQUIT TREE (*Prosopis juliflora*, DC.) from Jamaica, where it is known as CASHAW. The wood is hard and durable, and a gum resembling Gum Arabic exudes from the trunk. The leaves, shoots and pods are used to feed cattle. In dry weather the pods are said to be as nutritious as corn; but after rains horses often die from the distention due to the germination of the seed in the stomach. It is a native of the West Indies and Central America. *P. pubescens*, Bth., sometimes called the SCREW MESQUIT of which the twisted pods are also used as fodder, is found in Texas, New Mexico and California.

**No. 234.** Candlestick, work-bags, and other ornamental articles formed of the shining brown seeds of *Leucaena glauca*, Bth., a low erect tree, probably native of Tropical America, but now widely spread throughout Tropical Asia and Africa. CASE  
44.

**No. 235.** IRONWOOD of PEGU and ARRACAN (*Xylia dolabriformis*, Bth.). A large deciduous forest tree. The timber is durable, heavy, but difficult to work; it is however largely used for railway sleepers in Burma and India, and is also recommended for paving blocks, &c.

CASE 44. Tanning extract is obtained from the wood, specimens of which are shown.

**No. 236.** Pods and flowers of *Acacia farnesiana*, Willd. A shrub or low tree widely distributed in America, East and West Indies, Australia and Africa, and often planted for its ornamental character or for the sake of the perfume from its flowers, known as CASSIE. It is cultivated largely on the perfume farms of the South of France, and thrives better at Cannes than in any other part of Europe. A model of a still used by the perfumers for distilling flowers is here shown, also frames upon which a layer of fat is spread, over which the flowers are sprinkled, the perfume being absorbed by the fat. The perfume from flowers is also obtained by spreading cloths saturated with the finest olive oil over the wire frames here shown, and laying the flowers upon these cloths, leaving them for a long time till the oiled cloths have absorbed the perfume; the oil is afterwards obtained from the cloths by means of a screw press.

**No. 237.** BABÚL GUM from *Acacia arabica*, Willd., a moderate-sized tree found in India, Arabia, Egypt, Tropical and Southern Africa. Numerous samples of gum are shown of very different character, some in large agglutinated blocks, nearly black in colour, others in small roundish colourless tears. It forms some of the EAST INDIAN GUM ARABIC of commerce, but is mostly mixed with other gums. In India it is employed in native medicine, dyeing and cloth printing. The wood is very durable if well seasoned, and is used in India for wheels, sugar and oil presses, rice-pounders, agricultural implements, &c. The bark is used for dyeing and tanning. In Scinde and Guzerat large quantities of lac are collected from the tree.

**No. 238.** GUM ARABIC, obtained chiefly from *Acacia Senegal*, Willd., a tree about 20 feet high, native of Senegal and the Soudan. The gum exudes from the branches, "principally during the prevalence of the dry "desert winds from the north and east, which blow in "the winter after the rainy season." In some districts the issue of the gum is facilitated by incisions. The best

gum comes from Kordofan. The gum collected in Senegal is mostly shipped to Bordeaux to the extent of 30-35,000 cwts. annually for the last few years. The import of Gum Arabic from all sources into the United Kingdom during 1905 amounted to 73,222 cwts. of the value of £105,062. The bulk of the imports come through Egypt. CASE 44.

Though the best Gum Arabic of commerce is furnished by the species under notice, other species furnish inferior qualities. The following are the names of some of the principal Gum Arabic yielding plants, with the trade names of the gums.

<i>Acacia Senegal</i> , Willd.,	yielding	Kordofan, Picked Turkey, White Sennaar or Senegal Gum.
<i>A. stenocarpa</i> , Hochst. and <i>A. Seyal</i> , Delile, var. <i>Fistula</i> .	„	Suakin, Talca, or Talha Gum.
<i>A. arabica</i> , Willd. ...	„	Morocco, Mogadore, Brown Barbary, or East Indian Gum.
<i>A. horrida</i> , Willd. ...	„	Cape Gum.
<i>A. pycnantha</i> , Bth. ...	}	„ Australian or Wattle Gum.
<i>A. decurrens</i> , Willd....		
<i>A. dealbata</i> , Link. ...		
<i>A. homalophylla</i> , A. Cunn., and perhaps other species ...		

Gum Arabic is largely used for giving lustre to crape and silk, for thickening colours and mordants in calico printing, in the manufacture of ink and blacking, and very largely as a mucilage.

**No. 239.** CUTCH or BLACK CATECHU prepared by boiling the heartwood and pods of the KHAIR (*Acacia Catechu*, Willd.), and *A. Suma*, Kurz., forest trees of India and Burma. It contains much tannin, and is extensively exported to Europe for the use of tanners.

The word *Catechu* signifies tree-juice. It is sometimes called TERRA JAPONICA, a name which is more correctly applied to *Uncaria Gambier* (see case 63).

**CASE 44.** Catechu is packed for exportation in mats, bags, or boxes, the best quality coming from Pegu. Bengal and Burma, however, furnish a very large proportion of that imported into this country and America. Observe fine samples of Catechu, also of the wood, which is extremely durable, a rice-pounder made of the wood, and cordage prepared from the bark. This order (*Leguminosae*) is continued on the next floor.

#### MIDDLE FLOOR.

Observe opposite Case 45 a small cabinet made of Australian woods containing a valuable series of materials, fruits, &c., from the ancient Pile dwellings in the Swiss lakes.

**CASE 45.** The first compartment of this case contains woods, pods, gums, &c., of species of *Acacia* chiefly from India and Africa. In the next division are numerous specimens of the woods, barks and gums of Australian species of *Acacia*, among which may be noted the bark of DEAD FINISH (*Acacia tetragonophylla*, F. Muell.), and bark of MULGA (*A. aneura*, F. Muell.), both of which are useful for tanning purposes; the hard wood of the latter species is employed by the aborigines for boomerangs, spear-shafts, &c. Note also specimens of MYALL WOOD (*Acacia homalophylla*, A. Cunn.), valued for its dark colour, hardness, and fragrance, resembling fresh violets. It is much used for turners' work, and for the manufacture of tobacco pipes. The odour emitted from the tree when in flower, and just before rain, is said to be almost unbearable.

**No. 240.** AUSTRALIAN BLACKWOOD (*Acacia melanoxylon*, R. Br.), sometimes called LIGHTWOOD, chiefly in Tasmania. A large-sized tree affording a timber noted for its hardness and durability, by some people it is considered to be the most valuable of all the Australian timber trees. It was introduced into India more than 50 years ago, and is now completely naturalised in the Nilgiris. The wood is employed in Australia for a great variety of purposes, being much valued for furniture, picture frames, cabinet work, &c. Specimens are shown in the case and on the adjoining walls of axe and spade handles, shafts for carriages, wagons, &c.



In the last compartment of this Case may be noted CASE 45.  
 barks of the following species of *Acacia* from Australia:—  
 GREEN WATTLE or BLACK WATTLE (*Acacia mollissima*, Willd.), SILVER WATTLE (*A. dealbata*, Link.), and BROAD-LEAVED or GOLDEN WATTLE (*A. pycnantha*, Benth.). These species are among the more important of the tanning barks of New South Wales, known as WATTLE BARKS, the last named being described as “the best of the Australian tan barks,” and one of the richest tanning barks in the world. Some of the Wattles are cultivated in India and Natal. 17,513 tons of Black Wattle bark of the value of £102,666 were exported from Durban during 1905. The twigs of *A. dealbata* are sometimes used for basket-making.

The first compartment of this Case contains specimens of wood of various species of *Acacia* from Australia of more or less use for cabinet-making and building purposes. Note also BOOMERANGS, Australian weapons, which recoil when thrown, made of the wood of unknown species of *Acacia*. CASE 46.

**No. 241.** SABICU. The wood of *Lysiloma Sabicu* Bth., a native of Cuba. The wood is valuable for its extreme hardness and durability. It has been used for shipbuilding and for various structural purposes, also for making shuttles, as a substitute for boxwood. Note a specimen of HORSEFLESH MAHOGANY from Bahamas, apparently furnished by the same tree. Also wood of WILD TAMARIND (*Lysiloma latisiliqua*, Bth.), of Florida and the West Indies. Used locally in boat- and ship-building.

The lower portion of this compartment and upper part of the next contain numerous specimens of woods, barks, and gums of different species of *Albizzia*, such as *Albizzia procera*, Bth., a large deciduous tree widely spread in the West Indies, Malay, and Philippine Islands. The wood is even-grained and durable; used for sugar-cane crushers, rice-pounders, agricultural implements, &c. *A. odoratissima*, Bth., also a large tree of the central Himalaya, Ceylon, and Malacca. The wood is durable, and takes a good polish; it is used for wheels, oil mills, and furniture. The leaves and twigs are used as cattle fodder. *A. amara*, Boiv.,

CASE 46. a native of South India. The wood is very strong, close-grained, hard, and durable, and is used for beams, native houses, and carts. *A. Lebbek*, Bth., a large tree found throughout India and Ceylon, West Burma, and Tenasserim. It is often grown as an avenue tree, and its wood varies greatly in weight and strength. It is used for oil mills, wheel work, furniture, &c. A considerable amount of it has been exported to London of late years from the Andamans as a furniture wood under the name of EAST INDIAN WALNUT. The leaves and twigs are used to feed camels. *A stipulata*, Boiv., a large tree of the Tropical Himalayas to Ceylon and Burma. It is used for building purposes, cart wheels, furniture, and "has been tried for tea boxes, for which purpose it will probably suit well." A gum exudes freely from the stem and is used for sizing Daphne paper in Nepal. *A. Julibrissin*, Durazz., a moderate-sized tree found throughout the Himalayas, and distributed in Abyssinia, Eastern and Central Asia, China, and Japan. Like all the species, the tree is of rapid growth, and very handsome when in flower. The wood is used for furniture.

No. 242. Pods of the RAIN TREE (*Pithecolobium Saman*, Bth.); a native of the West Indies and South America. The name of Rain tree is derived from its being spoken of as occasionally in South America distilling moisture to such an extent as to wet the ground beneath. This is described as being caused by "multitudes of cicadas sucking the juices of the tender young branches and leaves and squirting forth slender streams of limpid fluid." The pods are sweet, and are used for feeding cattle. The plant has been introduced into India and other countries, and is considered a valuable shade tree in tropical pastures. In India the phenomenon said to be observed in South America does not occur. A photograph of the tree is shown, as well as a specimen of the wood, pods and seeds.

On the lower shelves are specimens of wood and pods of several other species of *Pithecolobium*. Note also the nearly circular pods of *Enterolobium Timbouva*, Mart., known as the OREJERA, and used as a detergent in Columbia. Saponin is found in all the organs of the plant, but more especially in the pericarp of the fruit.

Note in the first compartment of this case the long and rope-like pods of *Inga edulis*, Mart., a Brazilian tree; and wood and pods of some undetermined species of *Inga* and miscellaneous Leguminosae. CASE 47.

**Rose Order** (*Rosaceae*). A numerous family of trees, shrubs, or herbs, abounding principally in cool and temperate climates, and including many species of great importance. The Apple, Cherry, Rose, and Strawberry may be taken as familiar types of the group.

**COCO PLUM** (*Chrysobalanus Icaco*, L.). A shrub or small tree of Tropical Africa and Tropical America. On the Gambia the seeds, called VARACH, are strung on a stick and used as a candle. In Honduras the Spanish settlers express from them a bland fine oil. The fruits are about the size of an ordinary plum, and are either white, purple, red, or yellow. They have an acid pulp, and are eaten in the West Indies either raw or made into a conserve. Wood, fruits, and the strung seeds are shown.

**No. 243.** Bark of the CARAIPI or POTTERY-TREE of Para (*Moquilea utilis*, Hook. f.). The powdered bark, baked with an equal quantity of clay, makes vessels (**No. 244**) for domestic use, capable of withstanding a great amount of heat.

On the upper shelves of the next compartment are fruits of numerous species of *Parinarium*. The seeds of many of them contain oil, and are occasionally imported as oil seeds. The principal of these are: OITZIKA seeds from Brazil, and NIKO seeds from West Tropical Africa. Specimens in flower and fruit are much needed for their accurate determination. MABO seeds, hard, bony, two-celled stones, the kernels of which are very oily, appear to be furnished by *Parinarium Mobola*, Oliv., known as the MOLA plum in Zambesi-land.

The other species, fruits of which are exhibited, are the following:—*P. polyandrum*, Bth., from Upper Guinea, the fruit of which is described as "hardly edible"; *P. curatellaefolium*, Planch., a small tree of Zanzibar and the Niger River, where it is said to be one of the best native fruits; *P. capense*, Harv., a low shrub of Lower Guinea, South Central Africa, and the Cape. The GRAY

**CASE 47.** or **ROUGH-SKINNED PLUM** of Sierra Leone (*P. excelsum*, Sabine), a large tree; the pulp of the fruit is described as "dry, farinaceous, and, owing to the size of the stone, "small in quantity, with an insipid taste." The **BURI NUT** or **MAKETA** of the Fijis (*P. laurinum*, Gray); the kernels are beaten up, made into a kind of putty, and used for stopping holes in canoes, and for fixing spear-heads (see specimen from the Admiralty Islands) to the shafts.

**No. 245.** **BUCK POT** made by Caribs from the ashes of the **KAUTA** bark (*Hirtella americana*, L.) of British Guiana. Also specimen of the bark.

Observe specimen of the herb of the **MEADOW SWEET** (*Spiraea Ulmaria*, L.), formerly used in medicine in this country.

**No. 246.** **QUILLAIA BARK** (*Quillaja Saponaria*, Mol.). An evergreen tree, native of Chili and South Brazil. An infusion of the bark is much used in the arts as a detergent for washing silks, clothes, &c. In France, under the name of **BOIS DE PANAMA**, a tincture made from the wood is used as an agent in preparing emulsions from various balsams and oils. In medicine it has been proposed as a substitute for Senega root. It is imported into this country for the preparation of a hair wash and for other purposes. Recently an unfamiliar bark has appeared in commerce as Quillaia, but so far its botanical source remains undetermined.

Note on a lower shelf wood of **SAKURA** (*Prunus Pseudo-cerasus*, Lindl.), used by the Japanese for turnery, printing-blocks, carving, pipe-stems, &c. The flowering branches are much esteemed for ornament and are constantly introduced in artistic decorations.

The next compartment contains specimens of wood of several species of *Prunus*, chiefly from North America, also specimens of **PRUNE BARK** (*Prunus occidentalis*, Sw., a native of the West Indies), and a liqueur prepared from it. **WILD BLACK CHERRY BARK** (*P. serotina*, Ehrh.), used in medicine in North America. Wood of the **CHERRY LAUREL** (*Prunus Laurocerasus*, L.), a well-known shrub or small tree, the leaves of which yield hydrocyanic acid, and are used for making laurel water,

flavouring sweetmeats, &c. It is recommended, however, that "they should be employed with caution, as on account of their poisonous properties they may produce injurious, or even fatal effects." The fruits are said to be eaten in Imeritia, East of the Black Sea. CASE 47.

Observe wood, bark, and gum, of the COMMON CHERRY (*Prunus Cerasus*, L.). Also walking sticks and tobacco pipes made of cherry wood. Near these are fruits of *Prunus insititia*, L., the officinal prune of India. CASE 48.

**No. 247.** PLUMS, the fruits of *Prunus domestica*, L. The plum tree grows to 15 or 20 feet high. The French or St. Julien Plum, or Prune, is the produce of a variety, known as *Juliana*, grown in France, chiefly in the valley of the Loire, "especially about Bourgueil, a small town lying between Tours and Angers." It is also largely grown in S.W. France, especially in the department of Indre-et-Loire and Lot-et-Garonne. The fruit when thoroughly ripe is washed, exposed to the sun and then subjected to three or even four cookings on trays in immense ovens; the cookings each last six hours, the first is at a temperature of 50° C., the second of 70° C., and the third of about 90° C. After each cooking, the prunes are exposed to the air, and then flattened between two cylinders covered with india-rubber. Two claes or drying trays are exhibited in this Case. An inferior kind of dried prune is imported, when French prunes are scarce, from Germany. It is there known as Quetschen or Zwetschen, and is the produce of *Prunus domestica*, var. *prunealina*, DC. Another variety of Prune is largely produced in Servia and sent chiefly to Austria-Hungary and Germany, to the value of about £250,000 per annum. There is also an important Prune industry in California.

Prunes are valued for their nutritious, demulcent, and laxative properties. Amongst the other varieties of plums exhibited are Carlsbad plums from Germany, Elva plums from Portugal, Mirabelle Plums, and Greengages.

**No. 248.** PEACHES, the fruits of *Prunus Persica*, Stokes, a small tree, supposed by some to be native of Persia, but considered by De Candolle to be probably a native of China. Early introduced to and cultivated in

CASE 48. this country for the fruits. The nectarine is a variety of the same species. Peaches from Natal, and green peaches from France are exhibited.

On an upper shelf of the next compartment are dried APRICOT FRUITS (*Prunus armeniaca*, L.), an important article of food in the N.W. Himalaya. Oil for lamps, cooking, &c., is expressed from the kernels. Observe flat cake of compressed Apricot pulp, sold in bazaars at Damascus. Note on lower shelf shovel made of Apricot Wood, used in water irrigation of fields in Ladak, and a club for crushing rice in Ladak, made of the same wood.

Observe walking sticks made of the SLOE or BLACK-THORN (*Prunus spinosa*, L.), also portion of fishing line from Essex, the hooks being formed of the thorns of this plant.

**No. 249.** JORDAN and VALENCIA or SWEET ALMONDS, the kernel of the fruit of *Prunus Amygdalus*, Stokes, var. *dulcis*, a tree, cultivated in the North of Africa, Italy, Spain, &c. Jordan (corruption of Jardyne or Garden, *i.e.* cultivated) and Valencia Almonds are imported from Malaga, without the shell, and differ from other sorts by their large size and oblong form.

**No. 250.** BITTER ALMONDS chiefly from Barbary, Sicily, &c., of smaller size than the sweet variety, are the produce of *P. Amygdalus*, var. *amara*. ALMOND OIL is pressed from them on account of the greater value of the residual cake. This when crushed and distilled with water yields the ESSENTIAL OIL, which is extremely poisonous owing to the presence of Hydrocyanic (Prussic) acid.

On a lower shelf are shown leaves of *Rubus strigosus*, Michx., from North America; also a sample of wool dyed with the juice of the fruit of the common Blackberry (*Rubus fruticosus*, L.).

On an upper shelf of the last compartment of this case are specimens of "Blackberry" root (*Rubus occidentalis*, L.), from North America. Note also bundles of the dried herbs of the following:—Avens (*Geum urbanum*, L.), Wild Strawberry (*Fragaria vesca*, L.), Tormentil (*Potentilla Tormentilla*, Neck.), Cinquefoil (*P. reptans*, L.), Silverweed (*P. Anserina*, L.), Agrimony (*Agrimonia*

*Eupatoria*, L.), Salad Burnet (*Poterium Sanguisorba*, L.). CASE  
48  
These were all, at one time, used in medicine in this country, and are still used to a certain extent in rustic practice.

**No. 251.** KOUSSO or KOSO. The flowers of *Brayera anthelmintica*, Kunth, a handsome tree about 20 feet high, native of the higher mountainous districts of Abyssinia, and commonly planted near towns and villages throughout the country. For commercial purposes Koussou is gathered before the seeds are ripe, it is hung in the sun to dry, and then made up into bundles or cylindrical rolls, varying in length from 10 inches to a foot. These are packed in boxes, and reach England by way of Aden or Bombay. Koussou has a pleasant herby odour, and a bitterish acrid taste; it is used as an anthelmintic, and is very effectual in its action on tape worm. In large doses it has produced dangerous and even fatal results.

**No. 252.** ROSE BEDEGUARS: "Robin Redbreast's pincushions." Mossy excrescences often found on the common Dog-rose (*Rosa canina*) in hedges; they are occasioned by the puncture of *Rhodites Rosae*, L. Observe the Bedeguards cut across, showing the cavities containing the larvae.

On an upper shelf of the first compartment of this case note Petals of the French, Provins, or Red Rose (*R. gallica*, L.), cultivated in this country near Mitcham, in Surrey, as well as in Oxfordshire and Derbyshire, and to a large extent in Holland, and in the neighbourhood of Paris, for the petals, which after being gathered and dried, are used for colouring medicines, as well as for making confection of roses, a specimen of which is exhibited. CASE  
49.

**No. 253.** ATTAR or OTTO of ROSES, obtained by careful distillation from the petals of sweet scented species of Rose, *Rosa gallica*, L., *R. centifolia*, L., *R. moschata*, Herrm., and *R. damascena*, Mill., a cultivated race of *R. gallica*. Cultivated on the lower slopes of the Balkans, in Roumelia, for the production of Attar.

For the manufacture of Attar, the flowers are collected before sunrise in April and May. They are distilled as

CASE 49. soon as possible after gathering. "The first portions of the distillate are returned to the still; the second is set by for a day or two, and kept at a temperature not lower than 60°, in order that the oil may separate. The oil in a fluid state is then skimmed from the surface of the water by means of a very small tin funnel, having a fine orifice, and furnished with a long handle." The average annual produce of Roumelia, from whence the London market is chiefly supplied, is about 4,000 lbs., valued at £60,000. Some Attar is also obtained in the South of France, Tunis, and Persia, as well as at Ghazepore, in India. The Turkish Attar is almost invariably adulterated with the oil of an Indian grass (*Andropogon*). See Museum No. 2, Cases 97 and 98. Various specimens of Attar are exhibited, together with the tins in which it is exported, and a glass flask in which the Attar separates from the water and is skimmed off by a pipette which is also shown.

**No. 254. QUINCE** (*Pyrus Cydonia*, L.). The fruit is eaten stewed, in tarts and confectionery, or made into marmalade. Quince seeds are used in medicine for their mucilaginous properties. It grows wild in the South of Europe.

Note near these a series of fruits of **JAPANESE QUINCE** (*Pyrus japonica*, Thb.), from plants grown in the Royal Gardens. Also fruits of **CHINESE QUINCE** (*P. cathayensis*, Hemsl.), a native of China and Japan.

On the lower shelf of this compartment are specimens of woods of several species of *Pyrus* from India, North America, and Algeria.

**No. 255. APPLE** (*Pyrus Malus*, L.). Note dried and sliced apples, and Normandy pippins, also refuse "Trash" left in cider and perry making, used in Switzerland as fuel for stoves. Ordinary Cider contains about 5 to 6 per cent. of Alcohol and about 3 per cent. of ash, mostly due to alkaline salts. Specimens of the close and even-grained wood are shown, together with a gun-stock made of the wood, also branches injured by **AMERICAN BLIGHT** (*Schizoneura lanigera*). Models of several varieties of Apples and Pears are shown in a small case near top of stairs.



**No. 256.** PEAR (*Pyrus communis*, L.). Dried and compressed fruits are shown together with specimens of the hard and even-grained wood used for drawing squares and curves, specimens of which and a gun-stock are exhibited. CASE  
49.

**No. 257.** MEDLAR (*Pyrus germanica*, L.). Common in many parts of Europe, and occurring in English hedgerows.

On the middle shelf of this compartment are specimens of the wood of the MOUNTAIN ASH or Rowan tree (*Pyrus Aucuparia*, Gært.); useful as a nurse-tree in plantations, enduring severe exposure. Formerly regarded as a charm against witchcraft, &c.

Also wood of the WILD SERVICE tree (*Pyrus torminalis*, Ehr.), and on the lower shelves fruits and woods of several species of *Crataegus*.

**No. 258.** Wood of the HAWTHORN (*Crataegus Oxyacantha*, L.), and its variety the Glastonbury Thorn, which flowers sparingly in mid-winter. The wood is extremely hard, close-grained, and has been recommended as a substitute for box for wood engraving. A prepared block is exhibited.

**No. 259.** LOQUAT or JAPANESE MEDLAR, a dessert fruit, afforded by *Eriobotrya japonica*, Lindl. A native of China and Japan, cultivated in most warm temperate countries. CASE  
50.

On the lower shelves are specimens of woods of species of *Photinia* and *Amelanchier*.

**Gooseberry and Currant Order** (*Saxifrageae*). Trees, shrubs, or herbs of temperate or mountainous countries. Note woods of Indian species of *Hydrangea*, the native Laurel of Tasmania (*Anopterus glandulosus*, Lab.), and the Lightwood of New South Wales (*Ceratopetalum apetalum*, D. Don.), a light, tough and fragrant wood used for boat and coach building, tool handles, &c.

Also fruit of DAVIDSON'S PLUM (*Davidsonia pruriens*, F. Muell.), ripened in the Palm House at Kew. It is a native of Queensland.

CASE No. 260. GOOSEBERRIES (*Ribes Grossularia*, L.),  
 50. and CURRANTS (*R. rubrum*, L.), plants native of Britain,  
 and largely cultivated for the sake of their edible fruits ;  
 numerous varieties both of the gooseberry and currant  
 have arisen by cultivation. The fruits are very whole-  
 some, and large quantities are bottled for winter use.

**Witch Hazel Order** (*Hamamelideae*). A small group  
 of trees and shrubs widely distributed over the globe.

Observe fruits of *Altingia excelsa*, Noronha, a tree  
 growing from 60 to 100 feet high in Assam, Bhotan,  
 Pegu, Java, and Yunnan. The wood is used in Assam for  
 building and ordinary domestic purposes. Samples of oil  
 and balsam obtained from the tree in India are exhibited.

**No. 261.** LIQUID STORAX a soft viscid resin the pro-  
 duce of *Liquidambar orientalis*, Mill., a handsome branch-  
 ing tree, 30 or 40 ft. high forming forests on the extreme  
 south-west of Asia Minor. Liquid Storax is extracted  
 from the inner bark by boiling in water when the resin  
 is separated and skimmed off. The boiled bark is sub-  
 mitted to heavy pressure in hair bags, hot water being  
 added to cause the resin to flow more freely. The residue  
 forms the fragrant foliaceous cakes of bark known as  
*Cortex Thymiamatis*, a specimen of which is exhibited.  
 Liquid Storax is chiefly exported in barrels to Constanti-  
 nople, Smyrna, Syra and Alexandria. Some goes to  
 Smyrna packed in goat skins, and transferred to barrels  
 is shipped mostly to Trieste. It is also exported to  
 Bombay by way of the Red Sea, and from thence finds  
 its way in considerable quantities to China, which with  
 India are the principal markets. Liquid Storax, has  
 stimulant and expectorant properties, and is said to be  
 useful in chronic bronchial affections. It is little used in  
 this country except in perfumery.

Observe also fruits and wood of *Liquidambar for-  
 mosana*, Hance, a tree of Formosa, upon the leaves of  
 which a silkworm feeds. Cocoons of this silkworm are  
 exhibited. The wood is much used in China for tea  
 chests.

On a lower shelf are specimens of wood, fruits, and  
 balsam of SWEET GUM (*Liquidambar styraciflua*, L.),  
 a large American tree extending from Connecticut and

Illinois southward to Mexico and Guatemala. The resin exudes either from natural fissures or from incisions. The wood is imported into this country as SATIN WALNUT, AMERICAN RED GUM, &c. It is fairly hard, tough, and close-grained but warps badly in seasoning. Used for furniture, paving blocks, &c.

CASE  
50.

**Mangrove Order** (*Rhizophoreae*). Opposite-leaved trees, growing on the muddy shores of tropical countries.

CASE  
51.

**No. 262.** Germinating seeds of two species of MANGROVE (*Rhizophora Mangle*, L., and *R. mucronata*, Lam.); germinating in the fruit they form a long root before dropping to the ground, which they sometimes reach before becoming detached.

**No. 263.** MANGROVE BARKS and EXTRACTS prepared from them, which from their astringency, are used in tanning.

Note TENGAH BARK and EXTRACT (*Ceriops candolleana*, Arn.), employed in the Straits Settlements, &c., for dyeing and tanning.

**Myrobalan Order** (*Combretaceae*). All tropical trees and shrubs, growing in both hemispheres. They are characterized by some degree of astringency.

**No. 264.** Fruits, wood, gum, and oil obtained from the kernels of BAHEKA (*Terminalia belerica*, Roxb.), a large deciduous tree of India and Ceylon. The fruit is one of the MYROBALANS and is occasionally exported to Europe for dyeing and tanning, but it is thought little of and is barely worth the cost of collection and carriage. It is known in the London Market as BEDA NUT. In India it is employed in native medicine and for making ink.

On the lower shelves of this compartment are specimens of fruits, wood, bark and gum of ASAN, *Terminalia tomentosa*, W. & A., one of the mostly widely distributed and important of Indian forest trees. The wood is largely used for house building, carts, ship and boat building. When polished it resembles walnut, and is considered one of the best woods for making stethoscopes at the Government Medical Store Depôt, Bombay.

CASE No. 265. TUSSEH SILK, raw, and dyed; also specimens of the insects which produce the silk in India. These feed upon the leaves of *Terminalia tomentosa* and of those of several other trees.

No. 266. MYROBALANS or fruits of HIRDA (*Terminalia Chebula*, Retz.). A large deciduous tree found throughout India and Burma. The hard woody fruits are exported in large quantities from Bombay to Europe for the use of tanners. Specimens are also shown of astringent galls which form on the young twigs, and are employed in India for making ink, as well as for dyeing and tanning. The wood is hard and fairly durable; used for furniture, agricultural implements, &c.

Several other species of *Terminalia* are represented in this case including *T. angustifolia*, Jacq., the BOIS BENZOIN of Mauritius. It yields a fragrant resin like Benzoin (see Case 74), said to be used in Mauritius in churches as incense.

Note also fruits, wood, bark and oil of the INDIAN ALMOND (*T. Catappa*, L.). The kernels of the nuts are eaten at dessert and also yield an oil. Specimens are also shown of *T. Oliveri*, Brandis, the THAN tree of Burma where an extract of the bark, though itself poor in tanning, is used to adulterate Cutch (see No. 239).

CASE On an upper shelf are gum, leaves, and wood of 52. *Anogeissus latifolia*, Wall., a large tree common from the Himalayas to Ceylon. The wood is highly valued for its great strength and toughness, and is employed for furniture, ship-building, &c. The gum is extensively used in cloth printing in India, and the leaves in tanning.

The remainder of the compartment is devoted to woods, barks, and fruits of other Combretaceous plants.

**Myrtle Order** (*Myrtaceae*). A very large Order, numbering about 1,800 species, trees or shrubs; abounding in hot countries, especially South America, the East Indies, and Australia. The most northern member is the common Myrtle (*Myrtus communis*, L.), a native of Southern Europe. The Order abounds in a volatile oil, frequently fragrant, and giving character to the products of the group. The opposite and evergreen leaves, dotted with numerous little oil-glands, are marked by a marginal

vein. None of the Order have blue flowers. Observe the numerous specimens of Australian woods furnished by the genera *Melaleuca* (Australian Tea-trees, &c.) and *Eucalyptus* (the Gum, Iron-bark, and Stringy-bark). Some of the Gum and Stringy-bark trees rise to a great height, having straight, unbranched trunks, from 100 to 150 feet. Note also the variety in structure of the bark.

On an upper shelf of the central compartment observe specimens of oil from various species of *Melaleuca*, including *M. Wilsonii*, F. Muell, *M. linariifolia*, Sm., *M. hypericifolia*, Sm., and *M. decussata*, R. Br.

**No. 267.** Bark, annually shed, of *Melaleuca Leucadendron*, L. It is extremely durable, impervious to water, and is employed in Australia for thatching.

**No. 268.** CAJUPUT OIL. Obtained by distillation from the leaves of *Melaleuca Leucadendron*, L., var., *minor*. A small irregular tree of the Indian Archipelago and Malayan Peninsula. Cajuput oil is mostly obtained from Celebes, Bouro, and Amboyna, and comes in ordinary beer or wine bottles. It is used internally as a stimulant and antispasmodic, and externally as a rubefacient.

The last compartment of this case contains woods, fruits, &c., of various species of *Melaleuca*, *Angophora*, and of the important genus *Eucalyptus*, of which may be noted fruits, kino, wood and gun-stocks of the wood of SPOTTED GUM (*Eucalyptus maculata*, Hook.), from New South Wales. The wood is strong, close-grained and durable, and is in demand for ship-building, bridges, girders, and for general building work. From the leaves of *E. maculata*, Hook., var. *citriodora*, the CITRON, or LEMON-SCENTED GUM of Queensland, a fragrant oil is obtained. A sample is here shown.

On the bottom shelf are specimens of wood, kino, Lerp, and other products of *Eucalyptus viminalis*, Lab., the MANNA GUM of Australia, so called, as LERP or Mellitose, a kind of Manna exudes from the bark from injuries believed to be caused by the "Great Black or Manna Cicada" (*C. moerens*). Lerp has a pleasant, sweet taste, and is in much request by the aborigines as a food in the summer season.

**CASE 53.** The whole of this case is devoted to further illustrations of woods, oils, resins, &c. of the numerous species of *Eucalyptus*.

In the first compartment note the hard wood of the RED GUM Tree (*Eucalyptus rostrata*, Schlecht.), of Australia, together with kino from the same species; also tool-handles and wheel spoke of the wood of the IRON BARK Tree of New South Wales (*E. leucoxydon*, F. Muell.).

On a lower shelf observe spoke, felloe, and nave of wheel of YORK GUM (*E. loxophleba*, Benth.) of Western Australia. This timber is stated to be the best in Australia for wheelwright's work.

In the next compartment note mounted specimen of the bark of the PEPPERMINT Tree (*E. piperita*, Sm.), from New South Wales, showing natural deposit of kino. Also specimens of wood, kino, oil from the leaves, and a photograph of the base of a tree of *Eucalyptus amygdalina*, Lab., from Victoria, Australia, known as "Big Ben". The tree measured 56 feet in circumference at the base and was 400 feet high. This species forms the highest of all known trees, one is recorded measuring 470 feet high, far exceeding even the well-known Giant trees of California (*Sequoia gigantea*, Torr.). See Museum No. III.

**No. 269.** BLUE GUM (*Eucalyptus Globulus*, Lab.), of Victoria and Tasmania. One of the largest known trees, occasionally reaching a height of over 300 feet, and of remarkably rapid growth. Of late years this tree has become familiar, having been introduced and widely cultivated in many parts of the world, especially in the malarious parts of Italy and other districts of the Mediterranean region, and in many parts of India, especially in Southern India in the Nilgiris. In Australia the hard wood is employed for a great variety of purposes, including mill work, ship building, railway sleepers, poles and shafts for vehicles, tool handles, &c. The fruits are occasionally used for rosaries and necklaces. The leaves possess febrifugal properties and are smoked in the form of cigars or cigarettes, as a remedy for asthma. From the fresh leaves of this and of other species of the genus, EUCALYPTUS OIL of commerce is distilled. Considerable

attention has of late been bestowed upon the chemical constituents of these oils and they have been found to vary greatly in character. Their commercial value depends upon the percentage of Eucalyptol they contain. CASE  
53.

Note in the last compartment mounted specimens of the flowers and fruits of *E. macrocarpa*, Hook. Also road paving blocks of KARRI (*E. diversicolor*, F. Muell.), and of JARRAH (*E. marginata*, Sm.), two of the most important timber trees of Australia. The Karri is described as the finest and most graceful tree of the Australian forests. It is strictly confined to the South-western Division of Western Australia. An average tree attains a height of 200 feet with a diameter of 4 feet near the base; it is not unusual, however, to meet with trees 300 feet high. The timber is hard, heavy, elastic and tough, red in colour, and is very similar in appearance to Jarrah but not so easily worked. Its chief uses are for bridge planking, shafts, spokes, felloes, wagon work, beams, mining timber and paving blocks. The Jarrah is the principal timber tree of Western Australia, found only in the South-western Division of the Colony. The average height is 90 to 100 feet with a diameter of 2½ to 3½ feet at the base. When thoroughly seasoned the wood weighs 60 lbs. per cubic foot, is red in colour, takes a good polish and is comparatively easily worked. Some of its principal uses are for piles, jetties, bridges, boat-building, furniture, railway sleepers and paving blocks. Fine specimens of these timbers will be found in Museum No. III.

This case contains woods and other products of undetermined species of *Eucalyptus*, also weapons and other articles made by the aborigines. CASE  
54.

**No. 270.** Bark of a *Eucalyptus*, upon the inner surface of which drawings have been made by the aborigines of Victoria.

In the first compartment of this case note specimens of the wood, and essential oil distilled from the leaves of the SCRUB or NATIVE MYRTLE of Queensland (*Backhousia citriodora*, F. Muell.). The lemon-scented oil is used in Australia as a perfume for soap. Small quantities of it have recently been imported into this country as a perfume. CASE  
55.

CASE No. 271. Models and preserved Fruits of GUAVA 55. (*Psidium Guajava*, L.). A small tree, probably indigenous to Mexico and other parts of tropical America, but now cultivated and naturalised in most tropical countries for the sake of the fruits, which are used for dessert. Two distinct varieties are known; the apple-shaped or Red Guava (var. *pomiferum*), and the pear-shaped or White Guava (var. *pyriferum*).

Guava jelly, prepared from the fruits, is imported into this country from the West Indies.

On the top shelves of the next compartment are specimens of wood of Common MYRTLE (*Myrtus communis*, L.), a well-known evergreen plant of the Mediterranean region. On the outside of the case is a well-rope formed of the branches of this plant from Cyprus.

No. 272. ALLSPICE, PIMENTO, or JAMAICA PEPPER, the dried, unripe fruits of *Pimenta officinalis*, Ldl., a tree common in Jamaica; from whence large quantities are imported into this country. Pimento is very largely used as a spice, also in medicine for its aromatic and stimulant properties. Oil of Pimento, obtained by distillation from the fruits, is often used for similar purposes as the Oil of Cloves, as well as in perfumery. Sticks of the pimento are imported in very large quantities for walking sticks and umbrella handles.

From the leaves of an allied species (*P. acris*, Kostel.), the oil of bay or bay berry is obtained, used in the manufacture of BAY RUM, employed in the United States as a refreshing perfume in faintness, or to sprinkle about sick rooms, as well as for hair washes. The dried, unripe berries have similar properties to pimento or allspice.

No. 273. CLOVES. The dried, unopened flower-buds of *Eugenia caryophyllata*, Thunb., a tree originally brought from the Moluccas; now cultivated for this valuable spice in Amboyna, Malacca, Penang, Mauritius, Zanzibar, Pemba, in the West Indies principally at Grenada, and in other tropical countries. Cloves are collected by hand or broken from the trees by means of bamboos, cloths being placed beneath the trees to receive them, and simply dried in the sun. They are gathered in the green state, before



they ripen or turn red, and in drying they change to the familiar brown colour. Several varieties are known in commerce, those from Penang being considered the best. Cloves and Clove-stalks yield essential oil by distillation extensively used by soap makers, perfumers, and in medicine. Cloves themselves are very largely used as a spice, and in medicine, on account of their stimulant and aromatic properties.

During 1905, 136,724 cwts. of Cloves of the value of £287,073 were exported from Zanzibar; these were mostly grown in the island of Pemba. The bulk was exported to India, and nearly £35,000 worth came to the United Kingdom. Of Clove stems exported during the same period 92 per cent. went to Germany. Observe the curious and fragrant ornamental models from Amboyna made of Cloves strung together. Also silvered Cloves, and Clove confectionery from India. The dried fruits of the Clove Tree, under the name of MOTHER CLOVES, are sometimes imported. They contain, however, less oil than cloves, and are inferior in fragrance.

**No. 274.** ROSE APPLES, the fruits of *Eugenia Jambos*, L. A small tree of India, and cultivated in many tropical countries. The tree is planted for hedges, shade, and ornament, as well as for the sake of the fruits, which have a fragrance similar to rose water, but a very insipid taste. They are usually about the size of a small apple, but vary in colour, some being white, others rose pink. Candied Rose Apples, preserved with sugar, are exhibited.

**No. 275.** Fruits and models of fruits of the JAMBOLANA (*Eugenia Jambolana*, Lam.), a large evergreen tree, generally distributed throughout India, Ceylon, the Malay Archipelago to Australia. The fruits are edible, and vary in size, the result of cultivation. The powdered seeds and also fluid extracts of the fruit and bark have a reputation in the treatment of diabetes. The wood, of which specimens are shown, is hard and durable, and is used for building purposes, agricultural implements, &c., and the astringent bark is used in dyeing and tanning, and in medicine. This tree is one upon which the Tasar silkworm feeds.

CASE 55. The rest of the compartment consists of woods and fruits of various other species of *Eugenia*.

CASE 56. Note on central shelf of the first division of this case the angular, float-like fruits of *Barringtonia speciosa*, Forst., a tree found in India and Ceylon, and extending to the shores of the Malay Islands, Australia, and Polynesia. Specimens are exhibited that have been washed ashore on the East Coast of Africa and Madagascar. Also fibrous inner bark of *B. racemosa*, Bl., and cloth prepared from it on the Zambesi. The bark is also used in North Queensland to stupefy fish.

On a lower shelf observe calyces of the flowers of *Careya arborea*, Roxb., used in Scinde as a remedy for colds. The wood is used in Burma for gun stocks, house-building, cabinet-work, &c., and the fibrous bark for coarse, strong cordage, and also for slow matches.

On an upper shelf of the next compartment are wood and fruits of ANCHOVY PEAR (*Grias cauliflora*, L.) a native of the West Indies. The fruit may be sometimes eaten by the natives, but is never gathered for sale to Europeans. The wood is said to split easily, and has been recommended for cask staves.

Observe also the woody fruits of species of *Couratari* from tropical America. The bark when beaten out is used to make articles of clothing. "While stopping for breakfast, some of the boatmen took the opportunity of making themselves new shirts. A young tree of the proper size was stripped of its bark to a height of 8 or 10 feet. This was taken to the river, placed on a log or stone, and beaten with a stick. When free from the outer bark the fibres are opened and form a good cloth. This is then folded in the middle, a space left for the arms, the sides sewn to near the bottom, and a slit cut for the head. When old these shirts are as soft as linen; and thus easily are the boatmen of the Beni supplied with clothing."—*Proc. R.G.S., June 1883, p. 324.*

**No. 276.** FRUIT of the CANNON-BALL tree (*Courou-pita guianensis*, Aubl.), from St. Vincent, so called from its spherical shape.

Under the name of MONKEY POTS the fruits of several species of *Lecythis* are known. They are very remarkable, consisting of a hard, round or lengthened capsule, con-

taining the seeds, and opening transversely by a lid at the top. They grew in the forests of the hottest parts of South America. The fruits of many species are used, after the seeds have been removed, as water vessels. Amongst the species exhibited are *Lecythis ampullaria*, Miers, *L. ampla*, Miers, *L. urnigera*, Mart., *L. lacunosa*, Miers, *L. usitata*, Miers.

In the last compartment of this case note wood of WADADURA (*Lecythis grandiflora*, Aubl.), of British Guiana. It is even-grained, dense, takes a good polish and is employed for furniture, turnery and barrel staves. Also observe wood and specimens of the bark of KAKARALLI (*L. Ollaria*, L.), of British Guiana. The wood is very dense and even-grained. It is said to resist both teredo and barnacles, and to be more durable in water than greenheart (see Case 98). Used for house framing, wharves, sluices, &c. The papery inner bark is employed by the natives of British Guiana for cigarette wrappers.

**No. 277.** SAPUCAIA NUTS, the edible seeds of *Lecythis usitata*, Miers, and of *L. Ollaria*, L., gigantic forest trees of Brazil and Guiana. Sapucaia-nuts are regarded as greatly superior in delicacy and flavour to the closely allied Brazil-nut.

**No. 278.** BRAZIL-NUTS, about twenty-four of which are contained in one of the hard-shelled fruits of the *Bertholletia excelsa*, H.B., an enormous tree, growing on the Amazon.

Note in the upper portion of this compartment, a kind of garment known as "Tacaé" worn by Cubén Indians on the Rio Uaupés, a tributary of the Amazon, made partly of the fibrous bark of a Myrtaceous tree.

On the lower shelves and in the next case the **Melastom Order** (*Melastomaceae*) is represented; a very large tropical family, characterized by opposite three-veined leaves, and splendid flowers with curious stamens, but affording very few economic products.

Note in the first compartment of this case, wood and combs made from the wood of *Memecylon edule*, Roxb., from Southern India, also specimens of the leaves which are used as a dye.

CASE  
57.

**Loosestrife Order** (*Lythrarieae*). Principally herbs with entire, opposite leaves, widely dispersed over the globe, some of the tropical species being shrubs or trees. The common Purple Loosestrife (*Lythrum Salicaria*, L.) of wet ditches, represents the Order in Britain.

Observe the dried flowers, wood, bark, and gum of *Woodfordia floribunda*, Salisb., a large shrub common throughout India and distributed in Tropical Africa, Madagascar, and China. The flowers are used for dyeing red in India.

**No. 279.** TULIP WOOD, from *Physocalymma scaberrimum*, Pohl, a Brazilian tree. The wood is beautifully marked with red streaks, and is used for inlaying costly furniture, caskets, &c.; a small box made of the wood is exhibited.

**No. 280.** HENNA, the powdered leaves of *Lawsonia alba*, Lamk., a shrub found throughout India, in Cabul, Persia, &c., and cultivated in many tropical and warm countries. Made up into a paste, and used by the Eastern women to dye their nails, by way of ornament, an orange-colour. The colour lasts from three to four weeks. Specimens are exhibited from Erzeroum, East Indies, Somali Coast, &c., also a packet of Henna as sold at Damascus. Fruits, wood, and bark of the shrub are likewise shown.

On the upper shelves of the next compartment are specimens of the leaves, fruits, bark, and wood of *Lagerstroemia Flos-reginæ*, Retz, described as the chief timber tree of Assam, Eastern Bengal and Chittagong, and one of the most important trees of Burma. Wood used for ship-building, boats, canoes, gun-carriages, &c. Note also wood, bark, and gum, of *L. parviflora*, Roxb., a large forest tree of India. The wood is employed by the natives for house-building, agricultural implements, &c. The bark is used both for dyeing and tanning, and the leaves are eaten by the Tasar silkworm.

**No. 281.** POMEGRANATES, the produce of *Punica Granatum*, L., cultivated from early antiquity for its fruit; naturalised in the Mediterranean region, but a native of Western Asia, south of the Caspian, and not of

Carthage, as its name would denote (*Malum punicum*). CASE  
 It was known to the Hebrews under the name *Rimmon*, 57.  
 and is mentioned in Deuteronomy as a product of  
 Palestine. The root is an excellent vermifuge; the bark  
 gives the colour to yellow morocco leather, which is  
 tanned with it. The dried rind of the fruit is valued as a  
 remedy in India for diarrhoea and dysentery. The flowers,  
 under the name of BALAUSTINE flowers, are sometimes  
 used for their astringent properties. Walking sticks are  
 made from the stems of young plants imported from  
 Algeria.

**Evening Primrose Order** (*Onagrarieae*). Herba-  
 ceous plants or shrubs, mostly of temperate countries;  
 some species, chiefly American, bearing beautiful and showy  
 flowers, as the Clarkias and Fuchsias of Gardens; Willow-  
 Herbs are among the British members of the group.  
 They do not possess any marked properties.

**No. 282. WATER CHESTNUTS**, the horned fruits of  
 species of *Trapa*, growing in ponds, lakes, &c., in  
 temperate Europe and Asia. In some parts of Southern  
 Europe the seeds of *T. natans*, L. [*T. bicornis*, L.], are  
 ground into flour which is made into bread.

The same species is collected in large quantities in  
 China for use as food. Another widely distributed  
 species, namely, *T. bispinosa*, Roxb., found throughout  
 India and Ceylon, is cultivated extensively for food in  
 Kashmir and in the lakes, tanks, and fresh-water reservoirs  
 of the North West and Central Provinces of India. In  
 Kashmir it is stated to furnish almost the only food  
 of at least 30,000 people for five months of the year.  
 Samples of flour prepared from these seeds in India and  
 known as Singhara flour are exhibited. During the  
 Hooly festival the flour is mixed with a dye from the  
 flowers of *Butea frondosa* and thrown over persons in  
 sport.

Observe rosaries made of the fruits of *Trapa natans*,  
 var. *verbanensis*, De Not., called FRUTTI DI LAGO from  
 Lago di Varese and Lago Maggiore, Italy.

In the small order *Turneraceae* observe specimens of  
 DAMIANA (*Turnera diffusa*, Willd. and its var. *aphro-*  
*disiaca*).

CASE 57. **Passion Flower Order** (*Passifloreae*). A group of twining herbs or shrubs, natives chiefly of South America. Some of the species produce edible fruits, as the GRANADILLAS (*Passiflora quadrangularis*, L., and *P. macrocarpa*, Mast.), SWEET CUP or POMME D'OR (*P. maliformis*, L.), also BELL APPLE (*P. laurifolia*, L.), natives of Tropical America and the West Indies. These fruits, of which examples are shown, may occasionally be seen in Covent Garden Market.

**No. 283.** PAPAWE, fruit of *Carica Papaya*, L. Though now widely scattered in the tropics, it is believed to have originated from the warm part of the American continent. In cultivated plants the fruits are 7 ins. to 15 ins. long, pear or melon-shaped, and are eaten by all classes in the tropics, and may occasionally be bought in this country. The milky juice has the property of rendering meat tender; it also yields Papain, a vegetable pepsin widely employed in the treatment of dyspepsia, &c. Note also fruits of *C. candamarcensis*, Hook. f., cultivated in Ecuador, up to an altitude of 9,000 feet. The fruit is described as possessing a delicious scent and grateful taste.

**Gourd Order** (*Cucurbitaceae*). A group of prostrate or climbing plants with palmately-lobed leaves and tendrils,—chiefly tropical, with but few species extending into cool regions. Cucumber (*Cucumis sativus*, L.) and Melon (*C. Melo*, L.) belong to the Order. Many of the species are acrid and purgative.

Observe on the lower shelves fruits and seeds of *Hodgsonia heteroclita*, Hook. f. and T., a large climber of India, Burma, and Malaya. Also the large acutely ribbed fruit of *Telfairia occidentalis*, Hook. f., a native of tropical Africa, cultivated for the seeds which are boiled and eaten. Fruit and seeds of *T. pedata*, Hook., from East Africa are also shown. The seeds are covered with a fibrous network, and the kernels yield oil; they are also boiled and eaten by negroes.

Observe the variety in form of the fruit of various species of gourd here exhibited, especially the snake gourd (*Trichosanthes anguina*, L.).

The next two compartments contain a large collection of tropical GOURDS and CALABASHES, some of remarkable size and shape; they are principally the shells of the fruit of *Lagenaria vulgaris*, Ser. They are employed for an innumerable variety of purposes,—as domestic utensils, drums, musical instruments, snuff-boxes, &c. The outer surface is often elaborately carved or painted. Specimens are exhibited from China, East Indies, Australia, New Zealand, and Central and Southern Africa. Dried gourds imported from Zanzibar into Bombay for making the native guitars (Tamboora) are considered much superior to the Indian. [The name *Calabash* is also applied to the shell of the fruit of *Crescentia*. See Case 87A.—In Museum No. II., a huge Gourd is suspended from the ceiling in the large room.]

**No. 284.** Fruits of *Luffa acutangula*, Roxb., var. *amara*. A climbing plant met with all over India where the fruits, seeds, and leaves are employed in medicine as an emetic, and the dried fibrous portion of the fruit serves as a brush for sizing paper.

**No. 285.** TOWEL GOURDS or LOOFAHS (*Luffa aegyptiaca*, Mill.), cultivated throughout the tropics. The close vascular network of the inside of the fruit serves as a scrubbing brush, sponge, and to strain palm wine. It is also worked up into light ornamental articles, baskets, &c.

In the German army it is used for stuffing saddles, and in the French as a lining for helmets. In a young state the fruits are edible and have been grown in this country under the name of SOOLY QUA.

Observe fruit and model of fruit of CHINESE WAX GOURD or WHITE GOURD MELON (*Benincasa cerifera*, Savi.). The plant is cultivated in China, Japan, India, and Africa, and often met with in a wild state. The White Gourd is used in India as a cooked vegetable, as a curry, and also for the preparation of a sweetmeat called *heshim*. The fresh juice from the fruit is used as a specific for hæmorrhage from internal organs.

Note also fruits and seeds of the NARAS (*Acanthosicyos horrida*, Welw.). A prickly dwarf shrub confined to the coast region of Angola and Dammaraland, bearing abundance of pleasant melon-like fruits of which the natives

CASE 57. are passionately fond. "They crowd down to the coast region and almost live upon, and then carry away with them, sacks of the seeds which are edible." These are also brought down by the coasters for market to Cape Town.

On the lower shelves of this compartment are fruits and models of fruits of *Momordica Charantia*, L., a climbing plant cultivated throughout India, Malaya, &c., for medicinal uses and as food. Also of *M. cochinchinensis*, Spreng., a species widely distributed in Tropical Asia. The fruit is occasionally used as food in India.

**No. 286.** Models of fruits of varieties of MELONS (*Cucumis Melo*, L.), presented by Messrs. Sutton, of Reading.

Models of Cucumbers (*Cucumis sativus*, L.), are also shown.

Note on a lower shelf of this compartment models of WATER MELONS, the fruits of *Citrullus vulgaris*, Schrad., a plant commonly cultivated in the east and Mediterranean region of Africa and Europe, as well as in the Western hemisphere, for the sake of its fleshy edible fruit.

**No. 287.** COLOCYNTHS, peeled and unpeeled. The fruits of *Citrullus Colocynthis*, Schrad., a perennial herb having a wide range from North-west India to Spain, Northern, Western, and Southern Africa, and Japan. The Colocynth is valued for the pulp in which the seeds are embedded. As seen in commerce the fruit is usually peeled. The pulp has no smell but an intensely bitter taste, and is used as a powerful cathartic, usually in combination with other ingredients.

CASE 58. Observe on the upper shelf of the first compartment roots and fruits of the SQUIRTING CUCUMBER (*Ecballium Elaterium*, A. Rich.), a prostrate perennial herb, common in waste places in the south of Europe. The active principle, *Elaterium*, is prepared from the juice which flows from the fruit when nearly ripe; it is used as a very powerful cathartic.

Note fruits of *Coccinia indica*, W. & A., a climbing plant common throughout India, often cultivated. The fruits are eaten fresh when ripe, and cooked in curries when green.



**No. 288.** Models of fruits of various kinds of Gourds **CASE**  
 as Vegetable Marrow, Dolphin Gourd, Knotted Poteron, **58.**  
 Custard, Crown, &c., furnished by *Cucurbita Pepo*, DC. ;  
 also the Portmanteau and other Gourds from India, the  
 produce of *Cucurbita moschata*, Duch., and Turban,  
 Yellow Poteron, Cushion and Ribbed Gourds, the fruits  
 of *C. maxima*, Duch. Ornamented Gourds of the latter  
 species from Bahia and Old Calabar are shown.

Note in the centre compartment of this case the acrid  
 and cathartic roots of the common BRYONY (*Bryonia*  
*dioica*, Jacq.), also fruits of MELO COTON (*Sicana odorifera*,  
 Naud.), from Jamaica and Brazil ; the spiny fruits of  
 CHAYOTILLA (*Hanburia mexicana*, Seem.) a Mexican  
 climbing plant, and the fruits of CHAYOTE, CHOCO or  
 CHRISTOPHINE (*Sechium edule*, Sw.) of Tropical America.  
 The latter is a favourite vegetable in the West Indies and  
 Madeira, and is sometimes sold in this country. The  
 root yields starch, or it may be eaten when quite young as  
 a substitute for the potato.

Observe also the beautiful winged seeds of *Zanonia*  
*macrocarpa*, Blume, a climbing plant of Java, and the  
 fruits and seeds of the ANTIDOTE COCOON of Jamaica  
 (*Fevillea cordifolia*, L.). The negroes in Jamaica fasten  
 a number of the latter upon a skewer and setting fire to  
 the uppermost, they burn very gradually to the bottom.  
 The oil extracted from them burns in lamps with a clear,  
 fine light and has been used for candle-making. The  
 seeds are also used locally as an aperient medicine.

The bottom shelf contains undetermined cucurbitaceous  
 fruits, seeds, &c.

**Indian Fig Order (Cactee).** A singular group of  
 succulent shrubs, most variable in form—angular, flattened,  
 or almost spherical, and frequently spinous, bearing often  
 large and showy flowers. They are almost exclusively  
 American, although the Indian Fig (*Opuntia Ficus-indica*,  
 Webb), has long been naturalised in Southern Europe and  
 hot countries. The fruits of various species of *Opuntia*  
 and of *Cereus giganteus*, Engel., and *C. Thurberi*, Engel.,  
 are eaten and much esteemed by the Indians of New  
 Mexico and Arizona.

**CASE 58.** Observe specimens of the stem of the **TURK'S CAP CACTUS** (*Melocactus communis*, Link and Otto), from the West Indies; also plants of *Echinocactus cylindraceus*, Engel., with long curved spines.

**No. 289.** *Calcium oxalate* deposited in immense quantities in the tissues of various Cacti (*Cereus* spp.).

**No. 290.** Portions of the **OLD MAN CACTUS** (*Cereus senilis*, Salm-Dyck), so called from the long white hairs which crown the columnar stems. One species in Western North America (*C. giganteus*, Engel.) attains a height of 45 to 50 feet.

**CASE 59.** On the upper shelves of the first compartment are fruits, &c., of various species of *Cereus*, chiefly from Venezuela, also portions of stem and a photograph of *C. giganteus*, Engel., and flowers of species of *Phyllocactus* and *Rhipsalis*.

**No. 291.** Woody portion of stem of *Opuntia Bigelovii*, Engel., from Arizona.

**No. 292.** **COCHINEAL.** Small hemipterous insects subsisting upon species of *Opuntia* and *Nopalea*, to which the wingless females attach themselves. Cultivated in the Canary Islands, Mexico, and Brazil, for the sake of their rich crimson dye, from which carmine and the lakes of the artist are made. Different kinds of Cochineal are known in commerce, as silver grain, black, white, &c. Specimens are exhibited from Teneriffe (which is the principal source of British imports), Mexico, East Indies, Java, &c. A view in the Cochineal Gardens or Nopaleries at Santa Cruz, Teneriffe, is shown in the North Gallery (No. 522). 2,388 cwts. of Cochineal were imported into the United Kingdom during 1905 of the value of £25,748. The remainder of this compartment is filled with fruits of various species of *Opuntia*.

**No. 293.** Fibrous portions of stems of **NOPAL** (*Opuntia Tuna*, Mill.), made into various ornamental articles. From Algeria.

**Fig-Marigold Order** (*Ficoideae*). A tribe of succulent plants, remarkably characteristic of the hot desert

plains of South Africa ; their flowers are often very beautiful. The Order is unimportant from an economic point of view but several of its representatives are employed for medicinal purposes in South Africa. CASE  
59.

**Umbellifer Order** (*Umbelliferae*), so called from the arrangement of the flower-stalks in heads or "umbels." There are about 1,300 species, all herbaceous and abounding in temperate climates. The products of the group vary much in character. Some species are acrid and poisonous, some secrete gum-resins, others again are aromatic and useful as condiments. Celery, Fennel, Parsnip, Carrot, and Parsley, are all familiar esculents belonging to the Order.

Observe leaves of the INDIAN PENNYWORT (*Hydrocotyle asiatica*, L.), used in India, internally as a tonic, and externally as a local stimulant, being more especially useful in cutaneous affections. The drug is generally much mixed with grass and weeds and is occasionally imported into this country.

**No. 294.** BALSAM BOG (*Azorella glebaria*, A. Gray), a singular feature in the landscape of the Falkland Islands, forming huge, hard, and perfectly hemispherical hillocks, often 2 to 4 feet in height. It yields a gum which has been used in medicine. [A "hillock" of the plant is exhibited in a glass case, opposite Case 49.]

Observe also tufts of plants of *Azorella Selago*, Hook. f., a very abundant plant in Kerguelens Land often covering the ground with dense masses of vegetation.

**No. 295.** Epidermis of the leaves of *Hermas gigantea*, L., separated from the veins and midrib by the Hottentots of South Africa. Used as a tinder, and made into miniature socks, gloves, &c.

On a lower shelf observe roots of the SEA HOLLY (*Eryngium maritimum*, L.). A British sea-coast plant, the roots of which are sometimes preserved in sugar and eaten as a sweetmeat.

Also leaves of the HEMLOCK (*Conium maculatum*, L.), a biennial herb on waste ground and hedge banks in many parts of England. Under the name of Conium it is used as a sedative and antispasmodic. In the East it is

CASE 59. prescribed as a neurotic in painful affections of the skin and subjacent tissues. The juice, probably mixed with Opium, was given by the Athenians to citizens condemned to death, as in the case of Socrates and Phocion.

**No. 296.** Tubers of the *ARRACACIA* (*Arracacia xanthorrhiza*, Bancr.), and starch obtained from them, from Jamaica. The tubers when boiled are eaten as a vegetable; grated they may be employed for thickening soup.

In the last compartment of this case observe models of the Celery plant (*Apium graveolens*, L.), the blanched stalks of which are eaten as a vegetable. In its wild state the Celery is found in marshy places by the sea in England and Ireland.

**No. 297.** Umbels of *Ammi Visnaga*, Lam., brought from Africa and the Levant to Marseilles. The "rays" are used in the South of Europe as tooth-picks. They possess the same grateful aromatic taste as the whole plant, which gives them an advantage over ordinary quill tooth-picks.

On the same shelf are shewn fruits (familiarily known as seeds) of the *AJOWAN* of India (*Carum copticum*, Benth.), an annual herb, cultivated in many parts of Egypt, Persia, Afghanistan, and adjacent countries, and abundantly in Bengal. Ajowan fruits are stimulant and carminative, and contain a quantity of oil from which Thymol or Thymic Acid is obtained; both are exhibited.

**No. 298.** *CARAWAY SEEDS*, the fruits of *Carum Carvi*, L., a biennial or annual plant, naturalised in this country and common in Northern and Central Europe and West Asia to the Himalayas. It is cultivated in Essex and Kent, Holland, Prussia, and North Russia. Caraway fruits, called seeds in commerce, contain a quantity of oil, which is readily obtained by distillation. Both the fruits and oil are aromatic and stimulant; the oil is also used for scenting soap. By far the largest consumption of Caraways is as a spice for flavouring confectionery, &c.

On the same shelf observe stems of *Sium helenianum*, Hook. f. one of the few indigenous plants of St. Helena. The green stems are sold in the markets under the name

of JELLICO, (no doubt a corruption of Angelica, which the plant resembles,) and eaten raw. CASE 59.

Fruits are also exhibited of the FENNEL (*Foeniculum vulgare*, Mill.), a well-known garden herb. They are aromatic and carminative. Large quantities are used in cattle medicines, and the oil in cordials.

Observe also the fruits and roots of *Prangos pabularia*, Lindl., a perennial herb, known as the HAY PLANT of Tibet, used as a fodder plant, for which its cultivation in other countries has attracted some attention.

**No. 299.** SUMBUL or MUSK ROOT (*Ferula Sumbul*, Hook. f.). A perennial, dying after flowering, discovered in 1869 in the mountains south-east of Samarkand, at an elevation of 3-4,000 feet. Sumbul root, of commerce, is in roundish pieces,—transverse sections of the root, which vary considerably both in diameter and thickness. It has a bitter, aromatic taste and a strong, but pleasant, musky smell, which it retains for a long period. It is imported into this country and America exclusively from Russia, and is used in dysentery, diarrhoea, hysteria, and similar cases. CASE 60.

Note specimens of GUM SAGAPENUM, a rare drug, believed to be the produce of an Umbellifer of Western Asia, perhaps *Ferula persica*, Willd., or *F. Szowitsiana*, DC. Also on middle shelf a stool made of pieces of the stem of *Ferula communis*, L., from the Island of Amorgos, Greek Archipelago.

**No. 300.** ASAFOETIDA. A gum-resin obtained from the thick roots of *Ferula Narthex*, Boiss., *F. foetida*, Regel, and probably other allied species. These species are large perennial herbs, which die after flowering. The first is a native of dry sunny places on the northern slopes of the mountains dividing Kashmir from Western Tibet, and yields Tibetan Asafoetida. The second grows on the east of the Sea of Aral, and also south-east of Samarkand and in Northern Afghanistan; it probably extends over a wide district in South Western Asia. It furnishes Persian Asafoetida. The gum-resin is collected about the middle of April or somewhat later, when the plant has ceased to grow. The root is cut with a sharp knife, covered with a small domed structure of twigs and clay, and after six

CASE 60. weeks the juice is scraped off with a broad iron spatula and put into a cup. At each collection a thin transverse slice is taken off, which causes the juice again to flow, and this is done till the root is exhausted. The contents of the cups are emptied into large vessels, and the juice exposed to the sun to harden. Asafoetida is mostly met with in commerce in lumps, and rarely in separate tears, varying in size from that of a pea to a walnut. It is a stimulant, antispasmodic, and expectorant, used to some extent in veterinary practice; much more, however, on the Continent than in England. In India and Persia it is also used as a condiment.

Observe stems, fruits and umbels of *Ferula foetida*, also umbel of *F. alliacea*, Boiss., from Kerman, Persia, yielding the Asafoetida exported to Bombay under the name of HING.

CASE 61. **No. 301.** GUM GALBANUM, afforded by *Ferula galbaniflua*, Boiss. and Buh., native of Afghanistan and Persia, and *F. rubricaulis*, Boiss., of Persia. *Ferula Schair*, Borszc., of the desert regions of the Syr-Darja, on the confines of Siberia and Turkestan, is also a source of the drug. In the first-mentioned species the stem, on injury in an early stage of growth yields an orange-yellow gummy fluid which slowly consolidates. The gum is commonly found adhering to the lower portions of the stem. No artificial means are employed in its collection. Galbanum finds its way by the Persian Gulf to Arabia and India and thence to Europe, but the principal supply is by way of the Levant. It occurs in commerce either in tears or masses formed of agglutinated tears with impurities of various kinds. It is separated from these by melting and straining. Galbanum is an antispasmodic and stimulant expectorant; externally, it is applied as a plaster in chronic pulmonary affections. It is, however, not so much used as formerly.

**No. 302.** GUM AMMONIACUM, obtained from *Dorema Ammoniacum*, Don, a large herbaceous plant, found in South-west and Northern Persia and Northern Afghanistan. It contains an abundant milky juice, which exudes upon the puncture of beetles, and dried by exposure to the air constitutes Ammoniacum of commerce. For commercial

purposes Ammoniacum is obtained almost entirely by way of Bombay, where it arrives in bales often mixed with large quantities of extraneous matter, from which it is sorted and sent to the various markets. It occurs in tears of a yellowish straw colour, or in lumps, the tears becoming agglutinated by pressure or heat. It is a powerful stimulating expectorant and valuable in chronic bronchitis and other pulmonary affections. Externally it is applied as a local irritant. Ammoniacum is, however, not so much used as formerly : it has a strong alliaceous smell.

A specimen of DOREMA root is also shown, which is imported into Bombay from Persia in large quantities, and used as incense in the Parsee fire temples. It "was some years ago exported to Europe as Bombay sumbul, "after having been cut up and impregnated with musk." When old or worm-eaten it becomes spongy, and might be mistaken for sumbul. Stems of the plant are shown at the back of the case.

The Ammoniacum here referred to is not that of Hippocrates, Dioscorides, and Pliny, which was used for fumigation and was derived from Africa. This last forms an article of trade between Egypt and Arabia and is furnished by a species of *Elaeoselinum*. A specimen collected in Morocco is shown on the bottom shelf.

A gum-resin very similar to the Ammoniacum of commerce is furnished by *Dorema Aucheri*, Boiss., a plant widely distributed in the western provinces of Persia and the neighbourhood of Ispahan.

Note also DILL seed, the fruits of *Peucedanum graveolens*, Bth. and Hook. f., an annual found throughout Southern Europe, extending from Spain to the Caucasus and Persia, and also into Egypt and Abyssinia. It was introduced into England at the end of the 16th century and is cultivated for the sake of the fruits, from which oil of Dill is readily obtained by distillation. Dill possesses stimulant, carminative, and aromatic properties, and is often administered in the form of Dill water.

On a lower shelf are models of PARSNIPS, the roots of *Peucedanum sativum*, Bth. and Hook. f., cultivated forms of the common wild Parsnip. The parsnip has been cultivated as an esculent from a very early period ;

CASE 61. numerous varieties are known, some of which grow to a great length, particularly in the Channel Islands.

**No. 303.** OPOPANAX. The gum-resin of a species of *Opopanax*, perhaps *O. Chironium*, Koch, a native of North Africa, Spain, and Dalmatia. This gum-resin has been described in old drug books since the time of Dioscorides, but even to the present time, little or nothing is known of its collection except that it exudes from wounds made in the roots. When first introduced Opopanax was not received with much favour as a perfume; of late, however, it is said to have had a larger sale than any other except Eau de Cologne.

At the present day the gum-resin known in commerce as Opopanax is believed to be derived from *Commiphora Kataf*, Engl., a native of Arabia, where the native women employ it for washing the hair.

Observe fruits of the Coriander (*Coriandrum sativum*, L.), known in commerce as CORIANDER seeds. The plant is an annual, found in many parts of the Mediterranean region. Corianders, at the present time, are cultivated largely in most warm countries of the globe, and in smaller quantities in some parts of Europe as well as in England, chiefly in Essex. They are stimulant and carminative, but are little used in medicine; sometimes however employed in veterinary practice, but their chief consumption is as a flavouring agent for culinary purposes and in the distillation of gin. They yield about one-half per cent. of volatile oil, samples of which are shown.

Note fruits of CUMIN (*Cuminum Cyminum*, L.), an annual herb cultivated from earliest times in the Mediterranean countries, used chiefly as a condiment in India, and as a constituent in curry powder, also to a small extent in medicine, and largely in veterinary practice. Cumin fruits are exported from Morocco, Sicily, Malta, Bombay, and Calcutta.

**No. 304.** Models of CARROTS, the roots of *Daucus Carota*, L., a biennial found in a wild state in fields and on the sea shores in England, and extending through Europe, North Africa, North and West Asia to India. By cultivation the roots of the wild carrot have become fleshy, and the various forms of Garden Carrot have been produced.



On the bottom shelf of this compartment observe roots, umbels, and fruits of *Thapsia garganica*, L., one of the plants supposed to be identical with the Silphium of Cyrenaica; a blistering substance obtained from the roots is largely used in France in the preparation of plasters.

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61.

**Ivy Order** (*Araliaceae*). Resembling the Umbellifers in many respects, but chiefly woody-stemmed; many of the species grow in hot countries.

**No. 305.** VIRGINIAN SARSAPARILLA, the climbing stem of *Aralia nudicaulis*, L., used medicinally in the United States.

**No. 306.** GINSENG, the root of *Aralia quinquefolia*, Decne. and Planch., var. *ginseng*, Reg. and Maack, native of North China. So highly valued as a tonic and stimulant medicine in China that it is sold at from 20 to 250 times its weight in silver, sometimes for 500 times this amount. Ginseng is a Government monopoly in Corea and the principal article of export from that country to China. During 1905, China received from Corea 107,485 lbs. of Red Ginseng of the value of £112,351. This variety of Ginseng ranks in quality next to Manchurian or Imperial and is prepared for export by steaming the roots for about four hours in wicker baskets enclosed in a closely fitting earthenware vessel pierced at the bottom with holes and placed over boiling water.

Note also roots of *A. quinquefolia*, Decne. and Planch., from North America, having slight demulcent properties, collected in the Alleghany highlands from Pennsylvania to Tennessee and sold at a dollar a pound for exportation to China as a substitute for the Eastern product. The average importation (of twenty years) mainly through Hong Kong is about 400,000 lbs. It is ranked by the Chinese as about fourth in quality, Japanese being the least esteemed.

**No. 307.** RICE PAPER. An instructive series, continued in the next case, illustrating the preparation of the "paper" from the pith of *Fatsia papyrifera*, Bth. & Hook. f., a tree of Formosa:—the large knives used to cut sheets from the cylinders of pith, specimens of the paper made into bundles (100 squares of about 2½ or

CASE  
62.

CASE 62. 3 inches, being sold by the Chinese for  $1\frac{1}{4}d.$  or  $1\frac{1}{2}d.$ , dyed rice-paper, artificial flowers, and paintings on rice paper by Chinese artists.

On the central shelf, in the middle compartment of this Case, note rope made of fibre of the common IVY (*Hedera Helix*, L.), together with very large section of the stem and a walking stick made of Ivy wood.

**Cornel Order** (*Cornaceae*). A small group of trees and shrubs, scattered over the globe, most abundant in the temperate regions of the northern hemisphere.

Note HASSAGAY WOOD (*Curtisia faginea*, Ait.). A tough wood used in South Africa for furniture, tools, wagons, &c., and by the natives for weapons. A Zulu spear with the shaft of this wood is shown, and on the wall near Case 53 is a painting (by the traveller Baines) of a Zulu war dance in which the natives are armed with the Hassagay.

On a lower shelf observe specimens of the hard and close-grained wood of the FLOWERING DOGWOOD of North America (*Cornus florida*, L.). Used for bobbins and shuttles for weaving; for the bearings of machinery, hubs of wheels, &c. The bark is tonic and astringent, and is employed in medicine in North America.

On the upper shelves of the next compartment note woods of several species of *Cornus* from North America, and India, also wood of the CORNELIAN CHERRY (*Cornus Mas*, L.), used in France for hammer and shovel handles, &c., and in this country under the name of "Acacia" for walking sticks.

The wood is known to the Turks as KIZZILJICK and is employed by them for dyeing their fezzes.

Observe edible fruits, preserved in syrup, of *Nyssa capitata*, Walt., known in North America as OGEECHEE LIME. They are said to have an agreeable acid flavour.

**Honeysuckle and Elder Order** (*Caprifoliaceae*). It consists of shrubs or small trees distributed through the temperate and sub-tropical regions of the northern hemisphere.

**No. 308.** Flowers of the AMERICAN ELDER (*Sambucus canadensis*, L.). Used in medicine in North

America. The flowers of the Common English Elder (*Sambucus nigra*, L.), are used for making Elder flower water, and the berries for making wine. CASE 62.

On the upper shelves of the first compartment are specimens of wood of several species of *Viburnum* and leaves of *V. dilatatum*, Thunb., used in the preparation of a beverage, and known as SWEET TEA in Szechuan. CASE 63.

Note also lace parasol cover made in Ireland from the fibre of the HONEYSUCKLE (*Lonicera Periclymenum*, L.), and a walking stick made of Honeysuckle stem.

**Peruvian Bark Order** (*Rubiaceae*). A very large Order of trees, shrubs, or herbs, numbering about 2,800 to 3,000 species; common in tropical countries. Characterised by opposite, undivided leaves, having scales (*stipules*) between the bases of the stalks. A small section (*Stellatae*), differing in having the leaves in whorls of from four to eight, represents the Order in cool countries. Several species afford most important economic products.

**No. 309.** NEGRO PEACH of Sierra Leone. The dense fruit-heads of the DOUNDAKÉ or EGBESSYE (*Sarcocephalus esculentus*, Afzel.). The root bark yields a yellow dye and a bitter astringent alkaloid, said to be a powerful antipyretic like quinine.

In the next compartment note wood of KADAM (*Anthocephalus Cadamba*, Miq.), used in India for building, and for tea boxes. Also wood of HALDU (*Adina cordifolia*, Hook. f.), an important forest tree of India. The wood takes a good polish, and is much esteemed in Northern India for combs and small articles of turnery; it is also used for furniture, agricultural implements, &c. Note also wood of KEIM (*Stephegyne parvifolia*, Korth.), another important forest tree of India, where the easily worked wood has similar uses to the last mentioned.

**No. 310.** GAMBIER, PALE CATECHU, or TERRA JAPONICA, an astringent extract, prepared by boiling down the leaves and shoots of *Uncaria Gambier*, Roxb., a climbing hooked shrub, growing in the Malay peninsula and islands, used by tanners and dyers. Note on outside of case the heavy wooden fork for removing the spent leaves from the boiling-pans. A series of specimens of Gambier

CASE of various kinds is shown together with a view of a  
63. Gambier Factory in Singapore. (See also model of a  
Gambier Factory, Museum No. 3.)

Various species and varieties of *Cinchona* and *Cascarilla* barks are exhibited in this and the following Case. *Cinchona* bark comes into commerce in several forms, the chief, however, are *quilled bark*, which consists of that from branches and small trunks, which by drying roll up into pipes or quills, and *flat bark*, which is mostly from larger trunks, the bark being submitted to pressure. The barks of the various species of *Cinchona* contain in diverse proportions alkaloids of a valuable character, the most important of which is Quinine; this, in the form of a sulphate, is a highly prized tonic and febrifuge.

**No. 311. PALE CINCHONA, or CROWN BARK** (*Cinchona officinalis*, L.). A tree of 35 feet or more, but often found as a shrub, native of the mountain slopes of the Andes, at an altitude of 6-7,500 feet, in the district of Loxa, on the confines of Peru and Ecuador. Several varieties of this are known, the most distinct are *Uritusinga*, *condaminea*, *bonplandiana* and *crispa*. Very little pale *Cinchona* bark is now imported from Loxa, the plant being extensively cultivated in India, Ceylon, Java, and other countries. Specimens of root-bark, stem-bark, and renewed bark are exhibited from the Government *Cinchona* plantations, Darjeeling, from Madras, Ceylon, and Jamaica.

Note also specimens of *C. lancifolia*, Mutis, *C. pahu-diana*, Howard, from Darjeeling, *C. peruviana*, Howard, *C. humboldtiana*, Lamb., and *C. nitida*, R. and P.

CASE On the upper shelves of the first compartment are barks of  
64. *C. rosulenta*, Howard, *C. macrocalyx*, Pav., *C. micrantha*, R. and P., *C. ovata*, R. and P., and *C. scrobiculata*, H. and B.

**No. 312. YELLOW CINCHONA, or CALISAYA BARK** (*Cinchona Calisaya*, Wedd.). A large tree, native of the valley forests on the borders of Bolivia and South Peru, at an elevation of 4,500 to 5,400 feet. The plant is very variable in form, and several varieties have been cultivated. The richest, however, in quinine, is that known as *C. ledgeriana*, Moens, which is grown both in the

Dutch plantations in Java, and in the Indian plantations in Sikkim. Fine specimens of the bark of this variety are shown from Darjeeling and Ceylon, and of ordinary *Calisaya* from Bolivia, Peru, Darjeeling, and Jamaica. CASE  
64.

Note a series of ALKALOIDS obtained from Cinchona barks, consisting of Quinine, Cinchonine, Cinchonidine, Quinidine, &c. Also samples of CINCHONA FEBRIFUGE, obtained from bark of *Cinchona succirubra*, made and sold in India; the Crystalline febrifuge, also prepared and sold in India, and the Sulphate of Quinine, manufactured at Mungpoo, near Darjeeling.

**No. 313.** RED CINCHONA BARK (*Cinchona succirubra*, Pav.), a tree from 20 to 40 feet high, but sometimes attaining 80 feet. It was formerly common in the province of Huaranda, in Ecuador, but it has long been becoming steadily scarcer, and at the present time is found only on the Western slopes of Chimborazo, near Guayaquil, at an elevation of from 2,500 to 5,000 feet. This species has been very extensively cultivated in India, and also in Ceylon, Java, Jamaica, and elsewhere. Barks, mossed, unmossed, and renewed, are exhibited. Also various samples from Sikkim, Madras, Jamaica, Java, Ceylon, St. Helena, and South America.

Observe on a lower shelf of this compartment specimens of CUPREA BARK furnished by *Remijia purdieana*, Wedd., and *R. pedunculata*, Flueck., from Colombia.

Note also wood and bark of *Hymenodictyon excelsum*, Wall., from India, where the soft wood is in use for scabbards, grain-measures, toys, &c., and the bitter astringent bark is employed as a febrifuge and for tanning.

Specimens are also shown of DEGAME WOOD, believed to be furnished by a species of *Calycophyllum*. It is imported into this country in spars from the West Indies, and has similar uses to those of Lancewood.

On the upper shelves of the last compartment of this Case are specimens of WEST INDIAN or PRINCEWOOD BARK TREE (*Exostemma caribaeum*, R. and S.). The bark is bitter and had at one time a considerable reputation as a febrifuge, similar to Cinchona bark. The wood is hard, strong, close-grained and takes a good polish.

Observe CHAY ROOT (*Oldenlandia umbellata*, L.), collected in India in considerable quantities for use as a

CASE 64. red dye. Also portion of stem of *Posoqueria latifolia*, R. and S. ?, from Bahia, and walking sticks of the wood known as BRAZILIAN or CEYLON OAK.

CASE The first compartment of this Case contains chiefly mounted specimens of fruits of species of *Randia* and *Gardenia*, notably *R. dumetorum*, Lam., the fruits of which are used in India as a fish poison, and, when ripe, are said to be roasted and eaten; *R. malleifera*, Bth. and Hook. f., known as BOOJAY in Sierra Leone, where the fruits are said to yield a pure indigo dye. Under the name of BLIPPO, the Niam-niam of Central Africa employ the dye from this plant for staining their bodies. Note also fruits of *R. macrocarpa*, Hiern, and of *Gardenia Thunbergia*, L.

**No. 314.** DIKAMALI, the greenish yellow gum-resin obtained from *Gardenia lucida*, Roxb., and *G. gummiifera*, L., small Indian trees. The odour of the resin is peculiar and offensive, like that of cat's urine. Used in India in the treatment of cutaneous affections, to keep away flies from sores, and also as an anthelmintic.

A portion of a branch of *G. lucida* with the resin exuding, is shown.

**No. 315.** COFFEE, the seeds of *Coffea arabica*, L. A tree, native of Abyssinia and tropical Africa, now widely cultivated in hot countries. The East and West Indies, Java, Brazil, and Central America, afford the principal supply of this important product. The fruit of the Coffee tree, which resembles a cherry in size and colour, contains two seeds (beans), which are separated by mechanical means from the pulp. After fermentation and washing, the seeds pass through a rolling mill, which removes the parchment-like husk and the silver skin immediately enclosing the seeds. The commercial value depends on the size, form, and colour of the beans, and on their flavour. Pearl coffee is that in which the berry instead of bearing two seeds has only one which consequently takes a rounded form; a proportion of pearl coffee is produced in every crop. TRIAGE consists of the damaged and broken beans which though not of so good an appearance is equal in quality to the other kinds of coffee. Specimens of Coffee in the berry, and of the

different Coffees of the London market are here exhibited and continued in the next case. CASE 65.

The proportion of *Caffeine* in raw Coffee beans varies from about 1·10 to 1·28 per cent. It is not destroyed by roasting, and as a general rule, pure roasted coffee contains as much as 1·3 per cent.

A series of photographs illustrating the cultivation of Coffee in Central America will be found on the wall near Case 61.

Note Coffee sticks from Ceylon sometimes used as walking sticks, and tea made from the leaves of the Coffee tree, from Jamaica and the East Indies.

Also model of a coffee peeler or cleaner from Ceylon, and on the outside of the case one of a coffee sizer, by the use of which berries of three sizes are sifted.

**No. 316.** LIBERIAN COFFEE (*Coffea liberica*, Hiern), a glabrous shrub, native of Liberia. This plant has been introduced into many Coffee-growing countries, in consequence of its more robust habit than the *Coffea arabica*. The beans are much larger, and it thrives at lower elevations. CASE 66.

The total imports of raw Coffee into the United Kingdom from all countries during 1905 amounted to 929,459 cwts., of the value of £2,575,776.

Part of this Case is devoted to illustrations of the various diseases to which the Coffee plant is liable, especially *Hemileia vastatrix*, Berk. and Br., a parasitic fungus common in the Ceylon plantations, and *Cemiotoma coffeellum*, Mann, a small moth which has caused almost the entire destruction of the Coffee plants in Dominica.

**No. 317.** Fruits, wood, and roots of INDIAN MULBERRY; TOGARI of Madras (*Morinda citrifolia*, L.). A small tree or shrub of very variable habit, cultivated throughout India chiefly for its roots which yield the red dye known as AL. Cloth dyed with this substance is said not to be attacked by white ants and on this account is universally employed to wrap round account books of bankers and shop-keepers. Specimens are also shown of *M. tinctoria*, Roxb., which affords a red dye apparently identical with that of *M. citrifolia*, and of *M. angustifolia*, Roxb., and *M. umbellata*, L., employed in India as yellow dyes.

**CASE No. 318. IPECACUANHA.** The root of *Psychotria* 66. *Ipecacuanha*, Stokes, a small shrubby plant found in most parts of Brazil and also cultivated in India and the Straits Settlements. The roots afford an important emetic and valuable specific for dysentery.

During the year 1905, 454 bales of the drug, of an average weight of about 100 lbs., were imported into this country from Matto Grosso, Minas Geraes, Carthagena and Johore, the bulk coming from Brazil. It may be noted that CARTHAGENA or NEW GRANADA IPECACUANHA is believed to be the produce of *P. acuminata*, Benth. Observe also STRIATED or BLACK IPECACUANHA (*P. emetica*, L.), a native of Colombia. This drug occasionally appears in the London Market and is one of the many substitutes for the true product.

On a lower shelf observe mounted specimens of *Hydnophytum formicarum*, Jack.

**CASE** The first compartment of this case contains chiefly 67. mounted specimens of species of *Hydnophytum* and *Myrmecodia*, including *M. Beccarii*, Hook. f., from Australia, and *M. tuberosa*, Jack., from Malaya. These plants are constantly inhabited by ants.

Note a sample of UNDULATED or FALSE IPECACUANHA (*Richardsonia pilosa*, H. B. & K.), a very common plant in Brazil. When fresh it is pure white, becoming of an iron grey colour when dry. It is used for adulterating true ipecacuanha.

**No. 319. MADDER**, the root of *Rubia tinctorum*, L., at one time largely grown for the sake of its valuable red dye, in France, Southern Europe, and the Levant. From it alizarine, carmine, &c., are made. Its cultivation has almost entirely disappeared, owing to the more general use of alizarine artificially made from coal-tar dyes. Specimens of Alizarin, Rubianic acid, and Purpurin obtained from Madder roots are exhibited.

**No 320. INDIAN MADDER, or MUNJEET.** The roots of *Rubia cordifolia*, L., a climbing perennial, common throughout the hilly districts of India, and extending into Ceylon, Malacca, Japan, Java, tropical Africa, &c.; it yields an important red dye used in India. Observe specimen of Munjistin from *R. cordifolia*.



**Valerian Order.** (*Valerianeae*). Herbs of temperate climates, often aromatic or strong-scented. CASE 67.

**No. 321.** SPIKENARD (*Nardostachys Jatamansi*, DC.). A plant of the Himalayas, the rootstock has been highly valued in India from a remote period as a perfume.

Observe specimens of VALERIAN ROOTS (*Valeriana officinalis*, L.), a perennial herb common in this country, and widely distributed in Europe and in Asia, as far as Japan. Valerian is an antispasmodic cultivated for medical use near Chesterfield in Derbyshire, in Holland, and in the United States of America.

**Teazle Order** (*Dipsaceae*). A small group of plants destitute of important properties, having numerous flowers collected into dense heads, from which in some species the flower-leaves (bracts) project in pointed or hooked processes, as in

**No. 322.** FULLER'S TEAZLE (*Dipsacus fullonum*, L.). Cultivated in Yorkshire and on the Continent, for the use of woollen cloth manufacturers, who use the heads fixed in frames to give a "nap" to their fabrics, by raising to the surface some of the fine fibres of the wool. The heads are assorted commercially into different sizes and qualities, known as "King's," "Queen's," "Seconds," and "Buttons." Every piece of fine broadcloth requires from 1,500 to 2,000 teazles to bring out the proper nap, after which they are useless.

Note parasol handles formed of the fasciated stem of this plant.

**Composite Order** (*Compositae*). One of the largest and at the same time most naturally defined families of the Vegetable Kingdom: it is found almost all over the globe, from the tropics to very high latitudes. The Order is botanically marked by the flowers (florets) being collected into dense heads, the whole resembling a single flower, as in the Daisy and Dandelion; the stamens united in a ring by their anthers, and the simple structure of the fruit. Some species abound in a bitter aromatic principle, as the Wormwoods and Chamomile; others afford a milky, narcotic, or bitter juice, as the Lettuce and Dandelion.

CASE 67. Note mounted specimens of several species of *Lychnophora* from Brazil. Also the small black fruits of BUCKCHE (*Vernonia anthelmintica*, Willd.), used in India for the treatment of cutaneous affections, for preserving woollen goods from the attacks of insects, and for the expression of an oil. AYAPANA TEA, the leaves of *Eupatorium triplinerve*, Vahl., from Reunion. The plant is a native of Tropical America and naturalised in many parts of India. The leaves have stimulant, tonic, and diaphoretic properties. THOROUGHWORT, the leaves of *E. perfoliatum*, L., a North American medicinal plant. BITTER BUSH of Jamaica (*E. villosum*, Sw.), esteemed as a tonic and proposed as a substitute for hops.

GUACO (*Mikania amara*, Willd.). The leaves are used in South America and the West Indies as a febrifuge and anthelmintic, and also as a cure for snake-bites. Leaves of the DEER'S TONGUE (*Trilisa odoratissima*, Cass.), used in North America for scenting cigars and tobacco and also as a flavouring agent and perfume. BUTTON SNAKE-ROOT (*Liatris spicata*, Willd.), used as a diuretic in North America.

No. 323. MUSKWOOD of Tasmania, Victoria and New South Wales (*Olearia argophylla*, F. Muell.). The timber is close-grained, of a beautiful mottled colour and takes a good polish. It is well adapted for turnery, cabinet work and perfumery. The whole plant smells strongly of musk and it also yields a brilliant sap green.

CASE 68. On the upper shelves of the first compartment note woods of species of *Commidendron*, as *C. spurium*, DC., and *C. robustum*, DC., known as GUM WOODS in St. Helena, where they form some of the few endemic trees still remaining on the island.

The wood of the BLACK CABBAGE TREE (*Melanodendron integrifolium*, DC.), another species endemic in St. Helena, is also shown.

No. 324. Coat made of the tough leaves of the LEATHER PLANT of the Colonists of New Zealand (*Celmisia coriacea*, Raoul).

No. 325. AI, NGAI, or BLUMEA CAMPHOR obtained from *Blumea balsamifera*, DC., an evergreen shrubby

plant of South China, the Islands of Hainan and Formosa, and a common weed in Eastern India. The Camphor is produced in Kwangtung and Hainan, refined in Canton, and realizes about ten times the price of ordinary Camphor. It does not find its way into Europe as an article of trade, but is used in China in medicine and for perfuming the fine kinds of Chinese ink.

On a lower shelf observe Tinder made from the leaves of *Phagnalon rupestre*, DC., used in Spain.

**No. 326.** Tuft of plant of *Raoulia eximia*, Hook. f. It grows in large tufts on the mountains of New Zealand and is known as the SHEEP PLANT from its resemblance, even at a short distance, to that animal. *R. mammillaris*, Hook. f., is called the NEW ZEALAND PINCUSHION, and tufts of it are often used by the shepherds' wives for the purpose that its name implies.

Some fine tufts of these plants are exhibited in a special Case opposite Case 49.

On the middle shelf are dried leaves of *Helichrysum serpyllifolium*, Less., known as HOTTENTOT'S TEA, and *H. nudifolium*, Less., called KAFFIR TEA, both from the Cape of Good Hope.

**No. 327.** Plant of CAPE EVERLASTING (*Helichrysum vestitum*, Less.). The white silvery flower-heads are imported into this country in large quantities for decorative purposes. Observe Chaplet, or IMMORTELLE, made of the flowers of the "Yellow Everlasting" (*Helichrysum orientale*, Gært.), commonly hung about tombs on the Continent. Other Everlasting Flowers used for decoration exhibited in this Case are *H. bracteatum*, Willd., *Helipterum Manglesii*, F. Muell., &c.

On a lower shelf observe root of ELECAMPANE (*Inula Helenium*, L.), used in medicine as well as in the French liqueur Absinthe.

**No. 328.** Plant of a GUAYULE (*Parthenium argentatum*, A. Gray), from Mexico. This plant has recently come into notice as a source of rubber. There seems little doubt that it will yield rubber of fair quality, but it remains to be seen whether its extraction upon a commercial scale will prove successful.

CASE 68. On the bottom shelf note BHANGRA, the herb *Eclipta erecta*, L., used in Hindoo medicine as a tonic and in tattooing for producing an indelible bluish black.

**No. 329.** JERUSALEM ARTICHOKEs, the tubers of a Sunflower (*Helianthus tuberosus*, L.), originally introduced from the Northern United States. The Jerusalem Artichoke has been cultivated in England as an article of food since early in the 17th century. The tuber does not contain starch, hence it is not floury when boiled, like the potato.

SUNFLOWER SEEDS (*H. annuus*, L.) are here shown, together with samples of oil expressed from them. The sunflower is grown for this purpose in Russia and other countries, and it has also been introduced into India.

The seeds form an excellent food for poultry, and are also given to horses and cattle to keep them in good condition. The oil is extensively used as a food stuff and is said to approach more nearly to olive oil than any other vegetable oil known. The oil cake is rich in nitrogenous matter and is largely used on the Continent for fattening cattle.

**No. 330.** NIGER, INGA, or RAMTIL SEEDS (*Guizotia abyssinica*, Cass.). The plant is a native of tropical Africa, but is cultivated in many parts of India for the small black seeds, from which an oil is expressed, used as a lamp oil, for anointing the body, and as a condiment. In this country the seeds are employed as a medicine for cage birds.

Observe roots of the PELLITORY OF SPAIN (*Anacyclus Pyrethrum*, DC.), a perennial herb found wild in Algeria, and occasionally cultivated in English gardens; it is exported from Algeria to Leghorn and Egypt, from whence large quantities are sent to India. It is used in medicine, chiefly as a local irritant and sialagogue. An allied species (*A. officinarum*, Hayne), furnishes the root known as GERMAN PELLITORY. It is cultivated for similar purposes to the last mentioned in Saxony, Prussia and Bohemia.

**No. 331.** COLORADO RUBBER PLANT (*Hymenoxys* sp.). From the roots a rubber-like substance is obtained.

It does not however compare very favourably with many of the inferior grades of rubber already in commerce. CASE  
68.

**No. 332. CHAMOMILES.** The flower-heads of *Anthemis nobilis*, L., a perennial herb, wild, and cultivated in Europe, West Asia, and North Africa. Chamomiles are cultivated in this country, chiefly at Mitcham. The plant so grown "is always the 'double' state, in which the yellow disc flowers have all or nearly all become converted into white ray flowers." They are used in medicine as a stimulant, aromatic tonic. Oil of Chamomile, a specimen of which is shown, is mostly distilled from the entire plant, though sometimes from the flowers alone. It is a valuable carminative.

Observe specimens of YARROW, or MILFOIL (*Achillea Millefolium*, L.), a common British plant, used as an aromatic tonic and astringent. Also flowers, whole and pulverized, of *Chrysanthemum coccineum*, Willd., which furnishes PERSIAN POWDER, and flowers of *C. cinerariaefolium*, Vis., the source of DALMATIAN INSECT-POWDER; both are well-known insecticides.

On a lower shelf are WILD CHAMOMILE flowers (*Matricaria Chamomilla*, L.), which have somewhat similar properties to true Chamomile, and for which they are used as a substitute both in India and Europe.

Note also tuft of *Abrotanella forsterioides*, Hook. f., which forms dense green cushions on the summits of the Tasmanian mountains.

On the upper shelves of the first compartment of this case are specimens of TANSY (*Tanacetum vulgare*, L.), formerly used as a tonic, febrifuge, and vermifuge. CASE  
69. Observe also specimens of the GÉNÉPI DES ALPES (*Artemisia glacialis*, L.) and the GÉNÉPI BLANC (*A. Mutellina*, Vill.). Both species are collected in the Alps for the manufacture of Génépi, a rich green liqueur of the Absinthe type.

On the middle shelf observe specimen of WORMSEED or SANTONICA (*Artemisia maritima*, L.). This drug consists of the very small, unexpanded flower-heads of the plant, collected on the steppes or vast plains of the Kirghiz in Northern Turkestan. It is an anthelmintic. The crystalline substance to which the action of worm-

CASE 69. seed is due is Santonin ; it constitutes from  $1\frac{1}{2}$  to 2 per cent. of the drug. It is not limited to the flower-heads, but occurs also in the small leaflets. It reaches its maximum in July and August and disappears immediately after the flowering.

**No. 333.** WORMWOOD (*Artemisia Absinthium*, L.). An herbaceous perennial, common in this country, and distributed through the northern temperate old world. It has also become naturalised in the United States, and is cultivated at Mitcham and other places in England. The plant flowers and is collected in July and August. Wormwood has a strong aromatic smell, and a bitter, slightly aromatic taste. It was formerly extensively used as an anthelmintic, and had a reputation as a specific in intermittent fevers, before the introduction of Cinchona bark. A volatile oil is contained in the plant (a specimen of which is exhibited) ; it is one of the principal ingredients in the French liqueur known as Absinthe.

On a lower shelf note tinder formed of the epidermis of the leaves of *Liabum Bonplandii*, Cass., from Quito.

**No. 334.** Flowers, leaves, and root of ARNICA or MOUNTAIN TOBACCO (*Arnica montana*, L.). A perennial herb, native of moist meadows throughout Northern and Central Europe, and found on mountains in Switzerland, North Italy, and the Pyrenees. Arnica root of commerce consists of the dried rhizome and attached rootlets. These and the flowers have a slight aromatic odour, and an acrid bitter taste. Internally they are stimulant and irritant. Arnica, however, is chiefly used in the form of a tincture, for outward application in sprains, bruises, chilblains, &c.

On an upper shelf in the next compartment note flowers of the MARIGOLD (*Calendula officinalis*, L.), formerly in repute as a domestic medicine.

**No. 335.** DOGWOOD of Tasmania (*Bedfordia salicina*, DC.). A shrub 12 to 14 feet high. The wood, which is well mottled, and used for cabinet work, emits a foetid smell when cut and is exceptionally difficult to season.

Note plants of *Echinops strigosus*, L., used for making tinder by the mule drivers in Spain.

Note also a model of the CARDOON (*Cynara Cardunculus*, L.). A hardy perennial. The blanched stalks of the inner leaves are eaten as a vegetable. CASE 69.

Also ARTICHOKE HEADS (*Cynara Scolymus*, L.), a hardy perennial, cultivated in this country as a vegetable. The part eaten is the lower fleshy portion of the imbricated scales of the involucre and the receptacle.

Observe KENGUEL SEEDS (*Silybum Marianum*, Gærtn.), from Asia Minor, where they are roasted and used as a substitute for coffee. They are also believed by the Turks to have a medicinal value.

**No. 336.** COSTUS of the ANCIENTS, the root of *Saussurea Lappa*, Clarke (*Aucklandia Costus*, Falc.), a plant of Cashmere, where it is called KOOT. Large quantities of it are sent to different parts of India, the Persian Gulf, and China. It is used in medicine in India and China, and in Cashmere for protecting bales of shawls from the attacks of insects.

**No. 337.** SAFFLOWER. A beautiful rose-colour, used as a dye and rouge, obtained from the flowers of *Carthamus tinctorius*, L. Cultivated in China, India, the South of Europe, &c. The fruits contain a large quantity of oil, which is expressed and used in India for culinary purposes, and for burning in lamps; it is also said to be an ingredient in macassar hair oil. Under the name of KURDEE SEEDS they are imported into Europe from Southern India as an oil seed.

Observe roots and leaves of *Gerbera lanuginosa*, Sch. Bip. Also specimen of yarn made from the woolly leaves, and a bag made from the yarn and used by the Jampanees or carriers in the Himalayas for holding meal for making into bread.

Note also PIPITZAHOAC root and PIPITZAHOAC acid obtained from roots of *Perezia rigida*, A. Gray, from Mexico.

**No. 338.** CHICORY, the root of *Cichorium Intybus*, L., a plant wild and cultivated in England and other parts of Europe and largely used for the purpose of mixing with coffee. The roots are sliced, kiln-dried, roasted, and ground.

**CASE 69. No. 339. DANDELION ROOTS** (*Taraxacum officinale*, Wiggers), a common and troublesome weed almost wherever cultivation extends. Dandelion roots are inodorous, have a bitter taste, and are tonic, aperient, and diuretic. An extract is prepared from them. The roots dried, roasted, and ground are sometimes used to adulterate coffee, or even as a substitute for it. The blanched leaves are used on the Continent as a salad. Observe crystallized **MANNITE** from the Dandelion.

Note a specimen of **LACTUCARIUM** or Lettuce Opium obtained from several species of *Lactuca* as *L. virosa*, L., *L. Scariola*, L., &c. It is used in medicine as a mild narcotic. The leaves of the Garden Lettuce (*L. Scariola*) are very largely used as a salad.

**CASE 70.** In the first compartment of this Case note roots of **SCORZONERA** (*Scorzonera hispanica*, L.), a native of Spain, cultivated for the roots, which are used as a vegetable, as are also those of the **SALSAFY** (*Tragopogon porrifolius*, L.), which is found in wet meadows in some localities in Britain, but nowhere wild. It is occasionally cultivated in this country as a vegetable, but much more extensively on the Continent.

In the small order *Goodenovieae*, note **TACCADA PITH** from the stems of *Scaevola Koenigii*, Vahl, used by Malays and Siamese for making artificial flowers, &c. Observe models of fruits in this pith from Amboyna.

**Bluebell or Harebell Order** (*Campanulaceae*). A group of herbs or undershrubs scattered throughout the globe. Very few have any economic value.

**No. 340. INDIAN TOBACCO** (*Lobelia inflata*, L.). An erect annual or biennial herb, from one to two feet high, an inhabitant of dry places in the Northern United States, extending to Hudson's Bay and Saskatchewan on the one hand and to the Mississippi on the other, and found also in Kamtschatka. *Lobelia inflata* as imported into this country consists of the dried herb cut into pieces of varying sizes, and mostly compressed in the form of oblong, rectangular-shaped packages. *Lobelia* in small doses is expectorant and diaphoretic, in full doses emetic, and in excessive doses a powerful acro-narcotic poison; its effects being similar to those of tobacco.



**Cranberry Order** (*Vacciniaceae*). Shrubs or small trees, natives chiefly of cold and temperate regions. The fruits of some are edible, as the WHORTLEBERRY or BILBERRY (*Vaccinium Myrtillus*, L.), the COWBERRY (*V. Vitis-Idaea*, L.), and the CRANBERRY (*Oxycoccus palustris*, Pers.). Large quantities of Cranberries are brought to this country from Canada. They are the fruits of another species, *O. macrocarpus*, Pers. CASE  
70.

Observe specimen of BROUSSA TEA (*Vaccinium Arctostaphylos*, L.), used at Broussa and sold at about 8d. per pound.

**Heath Order** (*Ericaceae*). All woody plants, often bearing beautiful flowers, abounding in the temperate parts of the world, and the mountains of intertropical countries. Heaths are remarkably numerous in species at the Cape of Good Hope. In Europe, numerous individuals of two or three species cover very large areas, as the common Ling or Heather (*Calluna vulgaris*, Sal.). Note a Besom of this species on the top of the case.

Observe woods of species of *Arbutus* remarkable for the smooth chocolate-coloured bark.

Also leaves of the BEAR-BERRY (*Arctostaphylos Uva-ursi*, Spreng.), a dwarf sub-alpine shrub found in Europe, North Asia, and North America. The leaves have astringent properties, and are used in medicine chiefly in the form of infusion.

A specimen of cake made from the compressed fruits of *Gaultheria Shallon*, Pursh, from Vancouver Island, is also here exhibited.

Note leaves, and oil distilled from the leaves of the SPRING WINTER GREEN or PARTRIDGE BERRY (*Gaultheria procumbens*, L.), a dwarf shrub of North-West America. The leaves are used as an aromatic stimulant, and in some parts of North America as a substitute for China tea, under the name of Mountain or Salvador tea.

**No. 341.** WOODY ROOT, TOBACCO PIPES in the rough, and a finished PIPE of the TREE HEATH (*Erica arborea*, L.), from the South of Europe. This wood is the BRIAR ROOT of commerce, so much used for making pipes and chiefly produced at the present time in Calabria; the blocks being cut into shape upon the spot and shipped

CASE 70. to Leghorn, where they are selected and packed for export, the name Briar being a modification of the French *bruyère*.

Observe sample of leaves of *Ledum latifolium*, Jacq., known as LABRADOR TEA. The leaves have an agreeable odour and taste and are esteemed for their pectoral and tonic properties. They are said to have been employed as a substitute for tea during the American War of Independence. The plant is found in damp situations in the United States and Canada.

No. 342. *Rhododendron nivale*, Hook. f. Believed to attain the loftiest elevation of any Alpine shrub known; inhabiting a height of 17,500 to 18,000 feet, in the Eastern Himalaya, where it is, for eight months of the year, buried under many feet of snow.

On a lower shelf observe a sample of poisonous honey collected from the flowers of *Rhododendron ponticum*, L., from Erzeroum.

Also a YAK SADDLE made of the wood of *Rhododendron Hodgsonii*, Hook. f. Used in the Himalayas.

CASE 71. In the upper portion of the first compartment are exhibited woods of several species of *Rhododendron*.

Note leaves of SPOTTED WINTER GREEN or PIPSISSEWA (*Chimaphila umbellata*, Nutt.), employed in North America as a tonic and astringent medicine.

**Epacris Order** (*Epacrideae*). A group corresponding very closely to the Heath Order in general appearance and structure, and representing that family in Australia. A few afford edible berries.

No. 343. Observe specimens of *Richea pandanifolia*, Hook. f., a native of Tasmanian forests, which presents a peculiarly striking appearance from the huge crown of waving leaves surmounting a slender naked stem, often 36 feet in height.

Note in the small order *Plumbagineae* the peculiar structure of the woods of *Statice*, also roots of *Plumbago rosea*, L., employed in India in the treatment of cutaneous affections, dyspepsia, &c. The root-bark is a powerful vesicant. Specimens are also shown of the roots of *P. zeylanica*, L., which have similar properties to those of *P. rosea*, though to a much milder degree.

Observe also in the **Primrose Order** (*Primulaceae*) CASE  
flowers of the COWSLIP (*Primula officinalis*, Jacq.), used 71.  
for making wine, and the dried plants of the PIMPERNEL  
(*Anagallis arvensis*, L.), an abundant annual weed known  
as the POOR MAN'S WEATHER-GLASS in consequence of  
the flowers generally closing on the approach of rain.

Note also HAMAMA, the *Amomum spurium* of early  
writers on Materia Medica. It consists of the moss-like  
tufts formed by *Dionysia diapensiaefolia*, Boiss. The  
aromatic constituent probably resides in the glandular  
hairs with which the plant is more or less covered. It is  
a native of Persia from whence it finds its way into the  
Bombay Market.

**Myrsine Order** (*Myrsineae*). A group of tropical or  
subtropical shrubs or small trees of no great economic  
value. On the lower shelf, woods of several species of  
*Myrsine* are shown, and on an upper shelf of the next  
compartment is a pestle and mortar, as used in Dominica  
for cleaning coffee, beating yams, bread-fruit, &c., into  
pulp for use as food. The mortar is made of the wood of  
ADEGON (*Ardisia* sp.), and the pestle of the BOIS  
RIVIERE (*Chimarrhis cymosa*, Jacq.) belonging to the  
natural order *Rubiaceae*.

**No. 344.** FRUITS of *Embelia Ribes*, Burm., a scan-  
dent shrub found throughout India, Malaya, and South  
China. The berries are used as an anthelmintic, and to  
adulterate black pepper.

**Sapodilla Order** (*Sapotaceae*). Mainly trees and  
shrubs of tropical countries; frequently abounding in a  
milky juice. Several species afford edible fruits.

**No. 345.** STAR APPLE (*Chrysophyllum Cainito*, L.),  
a well-known and highly esteemed fruit of the West  
Indies and Tropical America. Spirit obtained from Star  
Apples and specimens of wood of the tree are also  
shown.

On the lower shelf of this compartment are fruits and  
wood of the MAMMEE SAPOTE or MARMALADE PLUM  
(*Lucuma mammosa*, Gaertn.), a native of the West Indies  
and South America, where the tree is cultivated for its

CASE 71. fruit, which contains an agreeably flavoured pulp. The seeds contain hydrocyanic acid, and are used in the West Indies for flavouring, as a substitute for bitter almonds.

CASE 72. In the first compartment of this Case note fruits of *Sideroxylon dulcificum*, A. DC., the MIRACULOUS BERRY of the West Coast of Africa. The fleshy portion of the fruit contains a peculiar sweetening property, and when eaten has the effect of neutralizing bitter and acid substances, such as quinine, lemon, &c.

On the outside of the Case observe section of stem and branches, with fruit, of *Argania Sideroxylon*, R. and S., a tree growing in Morocco. The pulp of the fruit is eaten by cattle; from the kernels ARGAN OIL, resembling Olive Oil, is expressed. A sample is exhibited in the Case, also a series of fruits showing the varied forms they assume; the wood is extraordinarily hard and durable.

Note on a lower shelf fruits of the NASEBERRY or SAPODILLA PLUM (*Achras Sapota*, L.), a native of tropical America, the West Indies, and generally cultivated in the tropics. The excellent fruit is much esteemed, and tastes like a superior medlar. An elastic gum furnished by the plant, and known as Chicle Gum, is imported into New York from Mexico for use as a masticatory. The wood is extremely hard and very durable.

On the upper shelves of the next compartment are samples of GUTTA PERCHA, known as NIATO BUNGA, NIATO TUNBAGA or NIATO BALAM from *Palaquium obovatum*, King & Gamble, also gutta from *P. clarkeanum*, King & Gamble, both large trees of Malaya. Note also oil obtained from seeds of *Dichopsis grandis*, Benth., a large tree of Ceylon, and bark and gutta known as PAUCHONTEE from *Dichopsis elliptica*, Benth., a large tree of Southern India.

No. 346. GUTTA PERCHA from *Palaquium Gutta*, Burck [*Dichopsis Gutta*, Benth.], a large evergreen tree of the Malayan Peninsula. This is the true Gutta Percha tree, and is described as being probably the most valuable of all the trees of the Peninsula. It is the source of TABAN GUTTA or TABAN MERAH, obtained by felling the trees and ringing the bark. Owing to the destructive method of collecting the gutta, the tree has become scarce

in a wild state ; it is now, however, being much planted, and there is every probability of its again becoming common. CASE  
72.

This destruction was stated in 1878 by Dr. Dennys, "to be so enormous that it seems impossible for the supply to long continue. It is computed that over 7,000 trees were cut down during 1877 in the neighbourhood of Klang, while 4,000 must have perished near Selangor in a single month to furnish the 270 piculs (a picul = 133½ lbs.) returned as exported. The estimated annual export from the Straits Settlements and the Peninsula was given as 10 millions of pounds in 1875, which at the high average of 16 lbs. to a single tree would give 600,000 trees. The demand seems always to exceed the supply." The quantity of Gutta Percha imported into this country in 1901 amounted to 88,438 cwts. of the value of £1,382,646, whilst the imports of this product during 1905 only amounted to 45,434 cwts. of the value of £361,475.

Various samples of crude Gutta Percha of different qualities are shown from Perak, Borneo, Singapore, &c.

Observe section of stem from Singapore which has been gashed for the extraction of gutta.

The last compartment of this Case contains numerous articles made from Gutta Percha. Note also sections of marine telegraph cables, telephone wires, &c., insulated with this substance.

On the upper shelves of the first compartment of this Case observe specimens of Gutta Percha from *Palaquium Gutta*, Burck, var. *oblongifolia*, a large evergreen tree of the Malayan Peninsula, and GETAH PUTEH and GETAH TABAN SIMPOR (*P. Maingayi*, King & Gamble), a tree attaining a height of 60 feet, also of the Malayan Peninsula. Near these note GETAH SOENTEI from *P. oleosum*, Burck, and a sample of concrete oil from the seeds, from Sumatra. Other gutta-yielding species of *Palaquium* are contained in this Case. CASE  
73.

**No. 347.** MAHWA or MOWA Tree (*Bassia latifolia*, Roxb.). This is one of the most important forest trees of India, where it is much cultivated, and where cultivated, frequently self-sown. It yields an excellent timber but is valued more particularly for the sweet and fleshy

**CASE 73.** corollas of the flowers, which form an important article of food both for men and animals in Central India, and yield by distillation a large percentage of spirit. The average yield of flowers per tree is estimated at  $2\frac{1}{2}$  maunds and they sell at about 12 annas per maund.

The fruit, ripe or unripe, is also valuable. The outer coat is eaten raw, or cooked as a vegetable; the inner one is dried and ground into meal. From the kernel a greenish-yellow oil or butter is obtained, largely used by jungle tribes or sold for soap-making. The oil cake is employed for feeding cattle.

**No. 348.** Seeds and oil of the MEE or ILLUPI (*Bassia longifolia*, L.), a large evergreen tree of India. The flowers are eaten in the same way as those of the last-named species, and the oil expressed from the seeds is used for similar purposes to that of Mahwa. The leaves, bark, and young fruit are used medicinally.

In the next compartment observe the seeds and vegetable butter of *B. butyracea*, Roxb. The solid white oil obtained from these seeds is of the consistence of lard. It keeps a long time without deteriorating, and is said to make good soap and candles. It is perfumed and used as an ointment in rheumatism.

The pulp of the fruit is eaten, and in Sikkim the bark is employed as a fish poison.

Note seeds of *Diplocnema sebifera*, Pierre, believed to be the source of the vegetable fat exported from Borneo under the name of MINJAK TANKAWANG. A sample of the fat is shown. Observe also wood, bark and GETAH SUNDEK from *Payena Ieerii*, Benth. and Hook. f., Perak. It is a tree growing from 80 to 100 feet high, and yields a second-rate variety of Gutta Percha and is probably also the source of GETAH SUNDI of Sumatra.

**No. 349.** BALATA, the inspissated juice of the BULLET or BULLY Tree (*Mimusops globosa*, Gærtn.), a large forest tree of tropical America. Balata is analogous to Gutta Percha, for which it is employed as a substitute in some industries where the use of the best quality of Gutta is not imperative; it is chiefly produced in the Guianas and Venezuela, from whence it is exported to European countries.

Specimens of this substance, both raw and in a manufactured state, together with samples of the hard, heavy and durable wood, are exhibited.

Observe portion of the stem and samples of the concrete milk of the MASSARANDUBA or COW-TREE of Para (*Mimusops elata*, Allem.); the milk, resembling good cream in consistence, exudes slowly from the wounded bark. It is too viscid to be a safe article of diet.

In the next compartment observe fruits, flowers, and oil expressed from the seeds of *Mimusops Elengi*, L. The fruit is largely eaten in Guiana and elsewhere, the fragrant flowers are used for making garlands, and the bark yields a tonic and febrifuge.

**No. 350.** Fruits and Seeds of KARITÉ or SHEA BUTTER Tree (*Butyrospermum Parkii*, Kotschy), grown in Western Africa. From the kernels a fat is obtained, called Shea butter, and used as butter by the natives. Samples of the fat as imported are shown, together with soap made from it. GUTTA SHEA, a hydrocarbon obtained from the fat in the manufacture of soap, is present to the amount of from .5 to .75 per cent. The milky juice of the tree when solidified is stated to have all the properties of Gutta Percha.

**Ebony Order** (*Ebenaceae*), consisting principally of tropical Indian trees, several of which afford a heavy and valuable wood.

On the lower shelves and in the next compartment, are specimens of woods of species of *Maba*, *Euclea*, and *Diospyros*.

**No. 351.** CALAMANDER or COROMANDEL WOOD (*Diospyros quaesita*, Thw.). A large tree of the forests of Ceylon, below 1,000 feet.

This is the chief of the trees producing CALAMANDER wood, now unfortunately scarce; it is a most beautiful cabinet wood, taking a high polish, and is so hard that edge tools can scarcely work it. Boxes and other articles made from it are exhibited.

**No. 352.** ANDAMAN MARBLE or ZEBRA WOOD (*Diospyros Kurzii*, Hiern). An evergreen tree growing

CASE 73. to a height of about 60 feet. Native of the Andaman and Nicobar Islands.

This splendid wood does not appear to be known in commerce, though it might prove of value in the European market, if it could be supplied in sufficient quantity.

It is recommended for cabinet-work, sticks, frames and carvings, but is said to be difficult to season, and liable to shrink and warp.

**No. 353. EBONY.** The chief source of this wood is (*Diospyros Ebenum*, Koenig). A large tree of Southern India and Ceylon. Very little of the wood is exported from India, as in that country the tree is usually of small size and somewhat scarce. Ceylon exports about 300 tons of the wood annually, the chief markets being England, Germany, and China. In Europe, Ebony is employed for turnery, cabinet-work, piano keys, rulers, &c. This wood is characterised by the extremely dark colour and hardness of the heart-wood (*duramen*), the sap-wood (*alburnum*) being white, and not durable.

The Greeks and Romans were acquainted with Ebony; it is mentioned by Dioscorides, Pliny, &c. Indian caskets, inkstand, and other articles, carved in Ebony are shown.

CASE 74. **No. 354. GAUB FRUITS** (*Diospyros Embryopteris*, Pers.). The Gaub is a tree growing to a height of about 35 feet, extending through India from the Himalaya to Ceylon, Siam, and the Malay Archipelago. The large round fruit is of a reddish colour and contains a viscid pulp, which is used as gum in bookbinding, and in place of tar for covering the seams in fishing boats. The fluid contains a large quantity of tannin, and is used medicinally as an astringent. The oil extracted from the seeds is also used by the natives in medicine. The leaves are used as cigarette wrappers in Bombay.

Note woods, fruits, &c., of other species of *Diospyros*, including *D. ehretioides*, Wall., a common Burmese tree, and *D. Melanoxydon*, Roxb., a tree of the Deccan Peninsula and Ceylon. This species yields Ebony, and the leaves are largely used as cigarette wrappers in Bombay. Note also edible fruits of EUROPEAN DATE PLUM (*D. Lotus*, L.), a native of Italy and of the East.



The fruit is eaten by Afghans, either fresh or dried, and is also employed as a remedy for diarrhoea. Specimens are also shown of the edible fruits of *D. mespiliformis*, Hochst., the MONKEY GUAVA of Upper Guinea. It is a shrub or small tree with a black heart-wood similar to Ebony, and is widely distributed in tropical Africa.

On the lower shelves note fruits and wood of the PERSIMMON (*Diospyros virginiana*, L.), a tree common in the Middle and Southern United States. The fruit has a strong astringent taste, and is hence used medicinally; when fully ripe or bletted it is edible. From the unripe fruit an indelible ink is made in the Southern States. The bark is bitter and a febrifuge; the wood is dark-coloured and hard, and used for weaving-shuttles, turnery, shoe-lasts, &c.

Observe on the upper shelves of the next compartment, edible fruits of the CHINESE DATE PLUM or KAKI of JAPAN (*Diospyros Kaki*, Linn. f.). They are highly esteemed in the East, both in the fresh and dried states. The plant has been introduced into European gardens, and the fruits may occasionally be seen in fruiterers' shops in this country. By cutting this fruit in halves, and putting it in water, the Chinese are stated to obtain an oil, which they employ for waterproofing umbrellas and hats.

**Storax Order** (*Styraceae*). A small group of woody plants affording the fragrant resins Benzoin and true Storax.

Observe LODH BARK (*Symplocos racemosa*, Roxb.), an Indian shrub or small tree. It was formerly regarded in Europe as a cinchona bark and known as 'China nova' and 'China californica.' At the present day the leaves and bark are used to a considerable extent in India for dyeing, giving yellow and red tints. The bark is also employed in medicine. Woods of other species of *Symplocos* are shown on the adjoining shelves.

**No. 355.** TRUE STORAX, a fragrant gum-resin obtained from wounds in the stem of *Styrax officinale*, L., a small tree of Southern Europe and Asia Minor. This substance was held in great estimation from the time of Pliny to the close of the 18th Century, since

CASE 74. which time it has completely disappeared from commerce. LIQUID STORAX is obtained from *Liquidambar orientalis*, Mill. (See No. 261.)

**No. 356.** GUM BENJAMIN or GUM BENZOIN, obtained from *Styrax Benzoin*, Dryand. A moderate-sized tree, found abundantly in Sumatra (where also it is cultivated), Java, Borneo, and in the Malay Peninsula, where, probably, it has been introduced.

Benzoin of commerce is obtained both from Sumatra and Siam. That from the latter country is procured from the district east and north-east of Luang Prabang, in the Shan States, but the plant furnishing it has not yet been identified.

Benzoin is collected in Sumatra by cutting deep incisions into the bark when the trees are about six or seven years old; as the resin exudes it becomes hard, and is scraped off with a knife. The best quality is that which is obtained during the first three years, and for the next seven or eight years the produce is browner in colour, and less valuable. A quantity of Benzoin is scraped from the wood of the tree after it is cut down; this is of a still darker colour, and is often mixed with pieces of bark and other impurities. Sumatra Benzoin always comes into commerce in lumps, and is of inferior quality to that from Siam, which comes either in tears or in masses of agglutinated tears. Benzoin is used as a stimulant and expectorant in chronic bronchitis and other affections of the lungs. It is one of the principal ingredients in "Friars' Balsam." Its chief use, however, is for incense, both in Europe and in the East. Various specimens of Benzoin are exhibited from Sumatra, Siam, Penang, and India. Of special interest is a sample which formed part of a ton of Benzoin recovered by divers in Table Bay about 20 years since. From the cases in which the gum was packed and from the date, 1691, which they bore, there is little doubt that it formed part of the cargo of a Dutch East Indian Company's Merchantman, bound for Europe, and wrecked in the Bay. Note also Benzoic acid and oil from Benzoin.

**Olive Order** (*Oleaceae*). A family characterised by opposite leaves and flowers with two stamens, natives of temperate latitudes; represented by the Ash in Britain.

Observe MOHLE FLOWERS (*Jasminum Sambac*, Ait.) and oil obtained from them, used in perfumery in India. They are also largely used by Hindus for making garlands. CASE 74.

Note also flowers of HARSINGHAR (*Nyctanthes Arbor-tristis*, L.), employed in India as a yellow dye for cotton cloths. They also yield an essential oil used in perfumery, and like those last mentioned, are made into garlands by the Hindus.

Observe wood of AMERICAN ASH (*Fraxinus americana*, L.), and various articles made of it. This wood is inferior to English Ash and is used for agricultural implements, carriages, tool-handles, oars, &c.

**No. 357.** MANNA, the concrete, sweet juice of the Manna Ash (*Fraxinus Ornus*, L.), growing in Sicily and Southern Italy. It is obtained from incisions in the bark, made in summer and autumn. A portion of a trunk showing the incisions is exhibited, also mannite and manna sugar. Manna is a mild and agreeable laxative.

**No. 358.** INSECT WAX, from China, secreted by *Coccus Pe-la*, Westw. The insects live and reproduce themselves spontaneously on *Ligustrum lucidum*, Ait. The Chinese transport the females and cultivate them in Western China on *Fraxinus chinensis*, Roxb., which is readily propagated by cuttings; in Eastern China *Ligustrum lucidum* itself is used. The wax is employed for a variety of purposes by the Chinese, as for coating candles (note examples), glazing paper, polishing furniture, and finishing the plastered walls of rooms (*see also* Case 75).

**No. 359.** Wood of the COMMON ASH (*Fraxinus excelsior*, L.), the toughest and most elastic of British timbers, greatly valued by the cart-wright, wheel-wright, cooper, machine-framework, and agricultural implement maker. In request in olden time for spears, and used at the present time for the shafts of lances carried by the British cavalry. An English ash-shafted cavalry lance is exhibited over the doors.

Note in the Case a series of specimens illustrating the manufacture of tennis rackets, an alpenstock, and other articles made of Ash.

CASE 74. Woods of other species of *Fraxinus*, chiefly from U.S. America, may be noted in this compartment.

In the last compartment of this Case note wood specimens of *Fraxinus floribunda*, Wall., a large deciduous tree of India, Burma, &c. The wood is tough and hard, and is employed in India for oars, jampan poles, ploughs, and other purposes.

On the lower shelves observe woods of several species of *Osmanthus*, *Notelaea*, and *Olea*, including *Notelaea ligustrina*, Vent., known as IRONWOOD in Australia and Tasmania. The wood is exceedingly hard, close-grained, and is used for mallets, sheaves of blocks, turnery, &c. Also INDIAN OLIVE, RAHU of SIND (*Olea cuspidata*, Wall.). The wood takes a good polish, and is highly prized for turning, for combs (specimens of which are shown), agricultural implements, &c. An oil obtained from the fruit is employed in medicine as a rubefacient. Both the fruits and the oil are shown.

On the bottom shelf observe BLACK IRONWOOD of Natal and the Cape (*Olea laurifolia*, Lam.). The wood is close-grained and very durable, and is extensively employed in South Africa for wagon work; it is also stated to be an excellent furniture wood.

CASE 75. No. 360. Branches of the OLIVE TREE (*Olea europaea*, L.), emblems of peace and plenty. A tree of Syria and Greece, naturalized abundantly on the shores of the Mediterranean, cultivated also in California and South Australia. Valued from a remote period for the sake of the oil obtained by pressure from the pulp of its fruit. Note Rosaries made of the wood and seeds of the Olive from Jerusalem. Also fruits from France, Italy, Spain, and California.

No. 361. Samples of OLIVE OIL, from Portugal, Spain, Sardinia, Tuscany, South Australia and California. During the year 1905, 7,690 tuns of Unrefined or Raw Olive oil, of the value of £256,601, and 4,352 tuns of the Refined or Edible oil, of the value of £184,885 were imported into the United Kingdom. The best quality of Tuscan olive oil is imported into London in casks.

Olive oil does not reduce silver nitrate, which cotton seed oil does. This affords a means of detecting as small

an adulteration as one per cent. Castile soap is made of olive oil and soda.

On a lower shelf observe IBOTA WAX from Tokio, Japan, obtained from *Ligustrum Ibotia*, Sieb., and probably the secretion of a *Coccus*.

Note also Chinese WHITE WAX and candles prepared with the same.

**Mustard Tree Order** (*Salvadoraceae*), a small group of trees or shrubs, natives of hot countries, of but little economic value.

Observe wood, bark, fruits, and oil of TOOTH-BRUSH TREE (*Salvadora persica*, L.). A small glaucous tree of India, Ceylon, Arabia, &c. The Mahomedans of Persia form tooth-brushes of the twigs. The bark has an odour like cress and the root-bark is very acrid and acts as a vesicant. The leaves are eaten as salad, and are also given as fodder to cattle. The seeds yield an oil.

**Dogbane Order** (*Apocynaceae*). Erect or twining shrubs, often with a milky, elastic, and sometimes very poisonous juice, mostly natives of the tropics. The Periwinkle (*Vinca*) of our gardens belongs to the Order.

The remainder of this Case and a portion of the next is devoted to illustrations of India-rubber or caoutchouc-producing plants.

Observe dried mounted specimen of *Leuconotis eugeniifolius*, A. DC., an evergreen shrub of Penang, Sumatra, and Borneo, and one of the sources of the Borneo Rubber, known under the name of MENUNGAN. Note also a portion of the stem, and a sample of Rubber from *Leuconotis Griffithii*, Hook. f., an evergreen shrub of Malacca.

Near these are portions of stems and rubber from *Willughbeia firma*, Blume, a large climber of Singapore, Sumatra, and Borneo. In both Borneo and Singapore it is said to yield the "GUTTA SINGARIP." Note also specimens of *Willughbeia flavescens*, Dyer, a large climber, yielding rubber, from Singapore.

On a lower shelf are samples of rubber and of the edible fruits of *Willughbeia edulis*, Roxb., an immense climber of India, Burma, Malacca, and Borneo. Also fruits, portions of stem and rubber from species of

CASE 75. *Clitandra*, including rubber from *C. henriquesiana*, Schum., a shrubby plant and one of the sources of root rubber from Lower Guinea.

This form of rubber is obtained by cutting the rhizomes into small pieces and extracting the rubber therefrom by pounding or beating.

On the bottom shelf observe specimens of rubber from the Gambia, probably yielded by *Landolphia Heudelotii*, A. DC., a shrub or climber of Upper Guinea, and one of the most valuable sources of West African rubber. Also rubber from *L. turbinata*, Stapf, Uganda, and portion of root and rubber from *L. Thollonii*, Dew., a dwarf shrub of Lower Guinea and a source of root rubber. The last compartment of this Case contains fruits, stems, and rubber from various species of *Landolphia* from Tropical Africa.

**No. 362.** Fruits, portions of stem and rubber from *Landolphia owariensis*, Beauv., a more or less scandent shrub or tree widely distributed in Tropical Africa, and one of the principal sources of African rubber. *L. Klainei*, Pierre, a scandent shrub of Upper and Lower Guinea and the principal rubber vine of the Gaboon district. *L. florida*, Benth., a tall, climbing shrub widely distributed in Tropical Africa. The fruits of this species are very sour, but are eaten by the natives of the West Coast and are known as ABOLI. Opinions as to the economic value of *L. florida* as a rubber producer are highly contradictory.

On a lower shelf observe fruits, portions of stem and rubber from *L. Kirkii*, Dyer, a scandent shrub, and one of the most important rubber plants of East Africa. Also samples of rubber from VAHY (*Landolphia madagascariensis*, Bth. and Hook. f.), a climbing plant of considerable size, and one of the sources of Madagascar Rubber.

CASE 76. **No. 363.** ROOT RUBBER from *Carpodinus lanceolata*, K. Schum., a glabrous perennial erect herb of Lower Guinea and South Central Africa. This species yields most of the root rubber of the Congo.

**No. 364.** FRUITS and RUBBER of MANGABEIRA (*Hancornia speciosa*, Gomez). A small tree native of

Brazil, and the source of MANGABEIRA or PERNAMBUCO RUBBER of commerce. During 1905, 1,404,825 lbs. of this rubber, of the value of £144,751 were exported from Brazil. The fruits known as MANGÁBA have an agreeable taste, and are eaten either in a fresh state or cooked in various ways.

Note fruits of the KARAUNDA (*Carissa Carandas*, L.), cultivated in most parts of India; the half ripe fruit is much used for pickles, and is also employed for tarts and puddings. When ripe, it makes good jelly, and is universally eaten by the natives. The wood is well adapted for turning. Spoons delicately carved from it in South India are exhibited.

Note specimens of the leaves, wood, &c., of *Acokanthera Schimperii*, Schwein., a glabrous shrub of East Tropical Africa. From the wood, the Wy Nyika and other tribes prepare a poisonous extract, used as an arrow poison over an extensive area in East Africa. Samples of the poison are shown.

Observe on the same shelf roots of *Acokanthera venenata*, G. Don, employed in the Taita District of South Africa as an arrow poison.

Note on the bottom shelf a Fijian native dress made of leaves of the VONO (*Alyxia stellata*, Roem. et Sch.).

In the next compartment note fruits of the TANGHIN (*Cerbera Tanghin*, Hook.), containing a poisonous juice, formerly used in Madagascar as an ordeal in cases of suspected crime or apostasy. Also fruits, oil from the seeds, and wood of *Cerbera Odollam*, Gaertn., an evergreen tree of India, Burma and Ceylon. The oil is used for burning. Note also fruits of the POKOSOLA (*Ochrosia elliptica*, Lab.), from the Solomon Islands. The flat kernels are said to be edible.

**No. 365.** PADDLE-WOOD, the remarkable buttressed or fluted stem of *Aspidosperma excelsum*, Bth. A tree of Guiana used for the rollers of cotton-gins, and by the Indians in making paddles. Observe the beautiful winged seeds.

Observe also bark, wood, and fruits of QUEBRACHO BLANCO (*Aspidosperma Quebracho-blanco*, Schlecht.), a tree native of the Argentine Republic. An extract has been used medicinally in various forms of dyspnoea.

**CASE 76.** The wood is used for tanning, but is not so valuable for this purpose as that of the Quebracho Colorado. (See Case 30.)

Note wood, bark, and weaving shuttle made of **CAPE BOXWOOD** or **KAMASSI** (*Gonioma Kamassi*, G. Mey.). The bark is employed at the Cape as a substitute for Angostura bark in making bitters.

Specimens are here shown of the wood and bark of *Alstonia scholaris*, R. Br., a tree of tropical Asia, Africa, and Australia. The bark, called **DITA BARK**, has been recommended as a most valuable antiperiodic, anthelmintic, and tonic. The milky juice yields a substance resembling gutta percha. Another species, *A. constricta*, F. Muell., a native of Queensland and New South Wales, has a tonic bark.

**No. 366.** Fruit, portion of stem and samples of **GETAH JELUTONG** or **PONTIANAC** from *Dyera costulata*, Hook. f., a large tree of Malaya. Getah Jelutong resembles a poor quality of gutta percha, and is mostly shipped to the United States of America.

On a lower shelf observe fibre and cloth called **DODO** cloth from the **KPOKPOKA TREE** (*Conopharyngia pachysiphon*, Stapf). A shrub of Upper Guinea.

**CASE 77.** Observe wood and bark of **KURCHI** or **CONESSI** (*Holarrhena antidysenterica*, Wall.), a small Indian tree, the wood of which is largely used for carving, turnery, furniture, &c., and the bark and seeds in Hindoo medicine. The former is one of their principal remedies for dysentery; both are very bitter.

**No. 367.** Frame carved in the hard, white wood of *Wrightia tinctoria*, R. Br., much used in India for carving and turning, and the leaves in dyeing. Note also fork, spoon, and platters carved in wood of *Wrightia tomentosa*, R. & S., from India.

**CASE 78.** On the upper shelves of the first compartment note fruits and seeds of species of *Strophanthus*, including those of **KOMBE** (*S. Kombe*, Oliv.), a rambling or climbing shrub of the Mozambique District. The seeds are imported into this country for medicinal purposes, being chiefly used for the treatment of cardiac affections.



On a lower shelf observe edible fruits and rubber from **CASE**  
**KYETPAUNG** (*Urceola esculenta*, Benth.), a large climbing .78  
 evergreen shrub of Burma, where it is common in the  
 Teak forests. Note also samples of fibre from *Apocynum*  
*cannabinum*, L., and articles prepared from the fibre by  
 North American Indians. Also fibre from the bark of  
*Anodendron paniculatum*, DC., a climber of India and  
 Ceylon. The fibre is strong and is used for fishing  
 nets, &c.

**No. 368.** Fruits, portion of stem incised for the  
 collection of rubber, and various samples of rubber, from  
 the **IRE** or **SILK RUBBER TREE** of Lagos (*Funtumia*  
*elastica*, Stapf), a large tree and one of the most  
 important sources of West African Rubber. This species  
 has been recently found in Uganda. A native drum made  
 from the wood of this tree from the Gold Coast is also  
 shown.

**Asclepias Order** (*Asclepiadeae*), represented in hot-  
 houses by the fleshy-leaved Hoyas and other beautiful  
 species. The Asclepiads are mainly tropical, many of  
 them African and Indian twining shrubs, frequently with  
 a milky juice. The structure of the flowers is very  
 anomalous.

**No. 369.** **INDIAN SARSAPARILLA**, the root of *Hemi-*  
*desmus indicus*, Br., a twining shrub, used medicinally in  
 India.

**No. 370.** **YERCUM** or **MADAR FIBRE**, obtained from  
*Calotropis gigantea*, Br., common in waste places in India.  
 The fibre obtained from the inner bark is very durable  
 and is used for bow-strings, fishing lines and nets.  
 Attempts have been made to weave the hair or floss from  
 the seeds, without, however, any satisfactory results.  
 The plant abounds in acrid milk, which has powerful  
 medicinal properties. Stems of the plant with the fibre  
 partially removed are exhibited, also twine made from  
 the fibre, and a specimen of woven fabric made from the  
 floss.

On the upper shelves of the first compartment observe **CASE**  
 specimens of fibre from the bark, floss from the seeds, .79.

**CASE 79.** which, like the last mentioned, is known as **MADAR**, and roots of *Calotropis procera*, Br. The dried bark of the root has alterative, tonic and diaphoretic properties.

Ob-serve stems and bark of **CONDURANGO** (*Marsdenia Cundurango*, Nichols.), a climbing plant of South America. The bark has alterative and tonic properties, and is a reputed cure for snake bites and cancer.

Also **RÁJMAHÁL HEMP**, the fibre of *Marsdenia tenacissima*, Wight and Arn., a large twining shrub of India. The fibre is very strong and durable, and is used for making bow-strings. *Marsdenia tinctoria*, Br., was formerly cultivated in Java as a source of indigo.

Note specimens of the seeds of **Asclepiads**, showing the beautiful crest of silky hairs which usually surmount them.

**Strychnos Order** (*Loganiaceae*). Chiefly tropical, bearing opposite, undivided leaves. The Order is eminently poisonous, affording some of the most dangerous drugs known to us.

Note **FALSE JASMINE ROOT** (*Gelsemium sempervirens*, Ait.), a woody vine, native of North America. Used in medicine, especially in cases of neuralgia, rheumatism, and fevers.

Observe herb of the **INDIAN**, or **MARYLAND PINK ROOT** (*Spigelia marilandica*, L.), a native of the Southern United States. It is an acro-narcotic poison, and is used in medicine in America.

**No. 371.** Fruits, seeds, wood, and bark of **NUX-VOMICA** (*Strychnos Nux-vomica*, L.), a moderate-sized tree of India, Burma, and Ceylon.

**No. 372.** **STRYCHNINE**, a poisonous alkaloid prepared from *Nux-vomica* seeds. Valued in medicine as a tonic and stimulant.

**No. 373.** **WOURALI** or **CURARE** of Guiana, a virulent poison, prepared from the bark of *Strychnos toxifera*, Schomb., by scraping it, steeping it in water, and concentrating the fluid by evaporation. It is used by the Indians to tip weapons for war and the chase. Note small calabash containing the poison as kept by the **Macusi** Indians, the principal makers of it.

Observe wood and seeds of the **CLEARING NUT TREE** **CASE**  
*(Strychnos potatorum, Linn. f.)*, a moderate-sized tree of **79.**  
 India and Ceylon. The ripe seeds are used to clear  
 muddy water, by rubbing them round the inside of the  
 vessel.

They are also much used in medicine, and the pulp of  
 the fruit is eaten and made into preserve. The wood is  
 used for ploughs, building purposes, cart-wheels, &c.

**No. 374. ST. IGNATIUS' BEANS.** The seeds of **CASE**  
*Strychnos Ignatii, Berg.*, a shrub or small tree, native of **80.**  
 the Philippine Islands. The properties of these seeds are  
 identical with those of Nux-vomica, hence they are largely  
 used in India, and with us for the manufacture of  
 Strychnine. The supply, however, is very irregular.

Note seeds of **MUSSAENDA COFFEE** (*Gaertnera vagi-*  
*nata, Lam.*), from Reunion. It is a low erect shrub, and  
 the seeds have been recommended as a coffee substitute,  
 but are of little value, as they do not contain caffeine.

**Gentian Order** (*Gentianeae*). A numerous and  
 widely dispersed family of herbaceous plants, generally  
 with smooth, entire, opposite leaves and beautifully  
 coloured flowers. They are characterised by a powerful  
 bitterness in every part; hence their use by all nations as  
 febrifugal and stomachic medicines.

Note specimens of root of *Gentiana Kurroo*, Royle,  
 occasionally used in India in medicine.

**No. 375. GENTIAN ROOT** (*Gentiana lutea, L.*). Native  
 of France, Germany, the Alps, Pyrenees, &c.; principally  
 employed as a tonic.

Note also roots of **FIELD GENTIAN** (*Gentiana cam-*  
*pestris, L.*), employed in rustic medicine as a tonic and  
 stomachic.

On an upper shelf of the next compartment observe  
**CHIRETTA** or **KIRÁYAT** of India (*Swertia Chirata,*  
*Ham.*). The entire plant is collected when in flower, and  
 is valued in Hindu medicine on account of its tonic,  
 anthelmintic, and febrifuge properties. It is frequently  
 imported into this country for medicinal purposes.

Note also **BOGBEAN** (*Menyanthes trifoliata, L.*), a  
 perennial marsh herb of this country, used in medicine

CASE 80. as a tonic and febrifuge, and also to add bitterness to beer.

**Borage Order** (*Boraginaceae*). Rough-leaved plants, with one-sided flower-spikes; growing in temperate countries, especially around the Mediterranean. The roots of some species afford dyes.

Observe woods of several species of *Cordia*, including that of the SEBESTEN TREE (*Cordia Myxa*, L.); also cordage made from the bark. It is a moderate-sized tree, found throughout India, Burma, and Ceylon.

The upper shelves of the last compartment contain a continuation of woods and fibres furnished by species of *Cordia* and of *Ehretia*.

On a lower shelf observe ALKANET-ROOT (*Alkanna tinctoria*, Tausch.), from the shores of the Mediterranean. It yields a red dye, used to stain furniture, &c.

CASE 81. On an upper shelf of the first compartment are specimens of THE DE MONTAGNE, the plant of *Lithospermum officinale*, L., dried and used as tea in the Pyrenees.

**Bindweed Order** (*Convolvulaceae*). Usually twining herbs or shrubs, with handsome plaited corollas, abundant all over the tropics. Represented in Britain by the common Bindweeds. The roots commonly possess an acrid and purgative juice.

**No. 376.** VERA CRUZ JALAP, the tubers of *Ipomoea Purga*, Hayne, a well-known drug, named Jalap from Xalapa, a city of Mexico, near to which the plant grows. This species is the principal source of Jalap. Specimens are also shown of TAMPICO JALAP (*I. simulans*, Hanbury), and of ORIZABA or MALE JALAP (*I. orizabensis*, Led.). During the year 1905, 119 tons of Jalap of the value of £3,948 passed through Vera Cruz for export.

**No. 377.** SWEET POTATO. The tubers of *Ipomoea Batatas*, Poir. Extensively cultivated in all tropical countries, although not known in a wild state. The tuber contains much starch and saccharine matter. In the Azores it is largely cultivated for the distillation of alcohol which is exported to Lisbon.

Models of tubers, sliced tubers, and starch obtained from them are shown. CASE  
81.

Note also tubers of the KUMARAH (*Ipomoea chryso-rhiza*, Hook. f.), of the natives of New Zealand; probably a variety of the last.

**No. 378.** SCAMMONY, a gum-resin obtained from the roots of *Convolvulus Scammonia*, L., a native of Asia Minor and Syria. It is chiefly exported from Smyrna and Aleppo, and is employed in medicine as a cathartic and vermifuge. Scammony is very frequently adulterated by the collectors, who mix with it carbonate of lime, wheat flour, sand, black lead, and other substances. Specimens of the root and of different qualities of Scammony are shown.

**Nightshade Order** (*Solanaceae*). A large and widely distributed group of herbs and shrubs, most abundant between the tropics, characterised by dangerous and narcotic properties. Familiar representatives are the Potato, Tomato, and Tobacco.

**No. 379.** TOMATOES, the fruits of *Lycopersicum esculentum*, Mill. A plant probably of Mexican or South American origin; commonly cultivated as an esculent.

Observe fruits of the BRINJAL, or AUBERGINE (*Solanum Melongena*, L.), a plant largely cultivated in hot countries. The fruits, which are more or less egg-shaped, vary considerably in size and colour, being either white, yellow, violet, purple, or nearly black. They are very highly esteemed in France, and are sometimes seen in the markets in this country.

Note also stems and herb of the BITTER-SWEET, or Woody Nightshade (*Solanum Dulcamara*, L.), a well-known hedge plant in this country; used in medicine in the form of decoction, in rheumatic or cutaneous affections.

On an upper shelf of the first compartment of this Case observe edible tubers, and models of tubers, of *Solanum Maglia*, Schlecht., native of Chili. This species is under experimental cultivation in this country. CASE  
82.

Observe a large series of models of POTATOES (*Solanum tuberosum*, L.)

**CASE 82.** The next compartment is chiefly devoted to illustrations of the uses of the POTATO, our most important esculent.

**No. 380.** Plant of Potato, showing the tubers to be an altered (thickened) condition of subterranean stems. It is a native of Chili, and is represented by nearly allied forms in the South-Western States of America. The potato was brought first to Great Britain in 1563. It was not, however, till late in the 18th century that it became popular. In the wild state the tubers are very small, seldom exceeding the size of a walnut. Specimens of these are shown in the second compartment. Observe BRITISH GUM or DEXTRINE, an altered product of potato starch, used for postage stamps; STARCH or English arrowroot, syrup and sugar from potatoes; dried compressed potatoes.

The potato is very liable, especially in hot and damp seasons, to attacks of disease caused by a fungus known as *Phytophthora infestans*, De Bary. A drawing is exhibited showing the progress of the disease in a potato leaf. Note also specimens and description of COLORADO POTATO BEETLE (*Doryphora Decemlineata*, Say.), a potato pest of North America.

Observe fruits of TREE TOMATO (*Cyphomandra betacea*, Sendt.), a shrub or small tree, native of Peru, cultivated in the South of Europe, West Indies, and other warm countries. When ripe the fruit is eaten for dessert and is also made into a preserve.

Also fruits of CAPE GOOSEBERRY (*Physalis peruviana*, L.), a native of Tropical America and cultivated in India and other parts for the fruits which are eaten raw or made into a preserve.

**No. 381.** CAPSICUMS and CHILLIES, the acrid biting fruits of *Capsicum annuum*, L., and *C. frutescens*, L., respectively, cultivated in all hot countries for use as a condiment.

CAYENNE PEPPER consists of the pulverised rind or skin and is chiefly prepared from the smaller fruits known as Bird-peppers or Chillies. The latter are regularly imported into this country, chiefly from Zanzibar and Sierra Leone for medicinal purposes, and for use as a condiment.

The upper portion of the first compartment of this Case contains Capsicum fruits from South America. CASE  
83.

Observe also fruits of PANIRBAND (*Withania coagulans*, Dun.), a small undershrub of Northern India and Afghanistan, where the fruits are employed by the natives to coagulate milk instead of using rennet, to which they object on religious grounds.

Specimens are also shown of MANDRAKE ROOT (*Mandragora officinarum*, L.). It was known to the ancients, and credited with many virtues, on account of the supposed resemblance of the root to the human figure.

**No. 382.** DEADLY NIGHTSHADE (*Atropa Belladonna*, L.). A dangerous powerful narcotic poison, usefully employed in medicine. It is an herbaceous plant, with solitary, lurid flowers, and violet-black berries, on short stalks, springing from the bases of the rather large ovate leaves. Found in waste places, often near old buildings, in England and on the Continent. Leaves and cigars made from them, also root and extract, as well as the alkaloid atropine, are exhibited.

**No. 383.** THORN APPLE or STRAMONIUM (*Datura Stramonium*, L., and allied species), a poisonous narcotic used in medicine. The leaves, fruits, and extract are shown.

**No. 384.** HENBANE (*Hyoscyamus niger*, L.). A viscid and hairy weed, growing in waste places about villages, with a dingy yellow flower, veined with purple. It is used in medicine as a sedative and substitute for opium, and is cultivated near Banbury in Oxfordshire, as well as in Surrey, Herts, Bedfordshire, and Cambridge-shire. The plant is known under two forms, annual and biennial. The latter produces in the first year only a large tuft of spreading radical leaves, and is preferred for medicinal purposes, an extract being prepared from the leaves.

Observe foliage of PACHI (*Fabiana imbricata*, R. & P.), a small shrub of Peru. It has been found useful as a diuretic and for the treatment of kidney diseases.

The remainder of this Case is devoted to TOBACCO, the dried leaves of species of *Nicotiana* (*N. Tabacum*, L., and

**CASE 83.** *N. rustica*, L.), both of American origin. During the year 1905, the total imports of Tobacco, manufactured and unmanufactured, into the United Kingdom, amounted to about 87,000,000 lbs., of the value of over £3,000,000. By far the greater proportion of the Tobacco consumed in the United Kingdom, is the produce of the United States. From Cuba, the Northern provinces of South America, Manila, Borneo, &c., further supplies are obtained.

The peculiar and characteristic narcotic principle of Tobacco, is developed in the leaf after it is collected, by a fermentative process, promoted by moistening it with syrup or brine. Latakia tobacco, specimens of which are shown in this Case, derives its peculiar aroma from the fact of its being dried over the smoke of the burning wood of *Quercus Robur*.

The last compartment of this Case contains various forms of Tobacco including samples from Persia, China, Japan, and Fiji.

**CASE 84.** The whole of this Case is devoted to Tobacco.

Observe in the first compartment samples from Manila, Borneo, Sumatra, &c., and in the second division various forms of Indian and Ceylon Tobacco and cigars.

Of the samples exhibited in the last compartment note specimens from Africa and commercial forms from America.

**CASE 85.** The exhibit of Tobacco is continued in this Case. On the upper shelves of the first compartment note specimens from the West Indies.

**No. 385.** English-grown Tobacco, and cigars made from the leaf, also samples of manufactured Tobacco from plants grown in Ireland.

Observe also in this Case various specimens of cut Tobacco, Cigars, Snuff, and a Water-pipe, as commonly used in China for smoking tobacco.

The last compartment contains a collection of Tobacco Pipes from various parts of the world.

**No. 386.** PITURI. The broken leaves and twigs of *Duboisia Hopwoodi*, F. Muell., a bush or small tree found in the barren deserts from the Darling River to Western Australia. Pituri leaves are chewed by the natives as a stimulating tonic to strengthen them in long journeys, or



to give them courage in warfare. Observe dilly bags as used by the natives for carrying Pituri; they are made in North Queensland from the split young leaves of *Pandanus aquaticus*, F. Muell. CASE 85.

The Australian Case on the opposite side contains a large series of Drift fruits and seeds from the shores of the West Indies, Ecuador, Keeling Islands, Solomon Islands, Fiji, New Guinea, Java, &c.

#### GROUND FLOOR.

**Figwort Order** (*Scrophularineae*), a numerous family, with a wide distribution, but few are prominent in economic use. Several are highly valued as ornamental flowers, as *Calceolaria*, *Pentstemon*, and *Paulownia*. CASE 86.

In the first compartment of this Case observe MULLEIN (*Verbascum Thapsus*, L.), a widely distributed plant, found in waste dry places. The leaves were formerly used in this country in domestic medicine in catarrh, and the wool for lamp wicks. The stems are occasionally used as walking sticks, specimens of which are shown.

Also herb of the FIGWORT (*Scrophularia nodosa*, L.), found in damp woods and thickets, and formerly employed in this country in medicine, as a purgative and emetic.

Specimens of the wood, fruits, and oil from the seeds of *Paulownia imperialis*, Sieb. and Zucc., are exhibited on the lower shelves. The wood is much valued by the Japanese for making boxes; one is exhibited.

Observe also flowers of *Lyperia atropurpurea*, Bth., from the Cape of Good Hope, used both in medicine, and for producing an orange dye.

**No. 387.** FOXGLOVE (*Digitalis purpurea*, L.). A tall and handsome plant, frequent in hedges in Britain. A powerful poison, used in medicine as a sedative and diuretic. The stems are occasionally used as sunshade handles.

Observe rhizomes of KUTKI (*Picrorhiza Kurroa*, Royle), a small plant of the Alpine Himalaya, employed in Indian medicine as a bitter tonic and antiperiodic.

Also CULVERS ROOT (*Veronica virginica*, L.), a native of the Eastern United States, where it is used in medicine as an emetic and cathartic.

**CASE 86.** Near this are specimens of **THÉ D'EUROPE** and **THÉ DE MONT CENIS**, the first is composed of the leaves of *Veronica officinalis*, L., and the second of those of *V. Allionii*, Vill. ; both are used as medicinal teas.

Note also herb of the **EYEBRIGHT** (*Euphrasia officinalis*, L.), a British plant, found in meadows and on heaths. It is astringent, and was formerly used in the preparation of an eye wash.

**Broom-rape Order** (*Orobanchaceae*), characterised by parasitical habit, brown colour, and absence of other than mere scale-like leaves.

**No. 388.** Mounted specimens of **BROOM-RAPE** (*Orobanche minor*, Sutt.), showing its parasitism on Clover and on Garden Pelargonium.

**Trumpet-flower Order** (*Bignoniaceae*), characterised by twining or climbing stems, often bearing divided leaves and magnificent flowers. They are mainly inter-tropical. Note the beautiful membrane-like wing, often of curious microscopic structure, surrounding the seeds of several species of the Order.

**CASE 87.** The first division of this Case contains chiefly mounted fruits and seeds of various species of *Bignonia*, *Adenocalymma*, *Pithecoctenium*, &c.

**No. 389.** Red Pigment, prepared from the leaves of the **CHICA** (*Bignonia Chica*, H. & B.), used by the Indians of South America as a paint for their bodies.

In the next compartment of this Case are pods, seeds, wood and bark of *Oroxylon indicum*, Vent., a small deciduous tree, found throughout India. The fruit and bark are used for tanning and dyeing, and the winged seeds as a lining for hats and for making umbrellas ; for the latter purpose they are placed between two layers of wickerwork.

In the last compartment observe wood of *Tecoma leucoxydon*, Mart., from the West Indies, also **WEST INDIAN BOXWOOD** (*Tabebuia pentaphylla*, Hemsl.). Both woods are hard and even grained. Sometime since the latter was proposed as a substitute for boxwood, for engraving purposes. This wood is exported in consider-

able quantities from Maracaibo to the United States, under the name of MARACAIBO BOXWOOD. CASE 87.

The first two divisions of this Case contain chiefly fruits, and woods, of species of *Spathodea*, *Dolichandrone*, *Heterophragma* and *Stereospermum*, from India and Burma. CASE 87A.

**No. 390.** Calabashes, the shells of the fruit of *Crescentia Cujete*, L., a tree of the West Indies and South America, applied to various domestic purposes, and often carefully carved or painted.

**No. 391.** Woody fruits of species of *Kigelia*, from Mauritius, Abyssinia, &c. CASE 88.

**Sesamum Order** (*Pedalineae*). A small group of herbaceous plants distributed over the tropical and sub-tropical regions of the New and Old Worlds.

**No. 392.** Remarkably armed fruits of *Martynia diandra*, Glox., and of *M. fragrans*, Lindl.

The rind of the fruit of the latter species is used by the Pima Indians of Arizona for basket work. Strips prepared for plaiting and a basket ornamented with them are shown.

**No. 393.** Fruits of the GRAPPLE PLANT (*Harpagophytum procumbens*, DC.), from South Africa.

**No. 394.** Seeds of SESAMUM, BENI, BENNE, TIL or GINGELLY (*Sesamum indicum*, L.), an annual, cultivated in warm countries, especially in Asia Minor for European demand, for the sake of the valuable—

**No. 395.** OIL OF SESAMUM or GINGELLY OIL, expressed from the seed. It is "the Oil" of India, where it is universally used in cooking, anointing, for soaps, &c.; in England it is used chiefly in soap-making, and to burn in lamps, and also for mixing with olive oil. In France and Italy cold drawn oil of Sesamum is used for salads, and in Japan and China the lampblack used in making the best Chinese ink is obtained by burning Sesamum oil.

**Acanthus Order** (*Acanthaceae*). A tribe of plants chiefly tropical, including, besides many weeds, some very beautiful hothouse species; but few have any economic value.

**CASE 88.** Observe ROOM or MAIGYEE, a blue dye (indigo) produced by *Strobilanthes flaccidifolius*, Nees, a shrub of North and East Bengal, extending from Assam into South China, where it is thought finer than the blue dye obtained from any other plant.

Note also stems of the KARIYAT (*Andrographis paniculata*, Nees), a plant common in dry, shady places in nearly all parts of India and Ceylon, and introduced into the Mauritius and West Indian Islands. It has bitter, tonic and stomachic properties similar to Chiretta and Gentian, with the former of which it has been confounded in Indian medicine.

Observe flowers, leaves, and wood of *Adhatoda Vasica*, Nees, a small shrub of India, Burma, and Malaya. The leaves yield a yellow dye, but their chief use is as a dressing for rice-fields, as they seem to have the power of killing aquatic weeds. An infusion of them is also used as an insecticide. The wood is employed for charcoal for making gunpowder.

Note specimens of root of TONG-PANG-CHONG (*Rhinacanthus communis*, Nees), used in India and China in the treatment of ringworm and other cutaneous diseases. The plant is universally known in Lower India as NAGAMULLIE.

Note a few products of a minor character belonging to the small order *Myoporineae*, an order of shrubs and small trees, chiefly Australian.

**Vervain Order** (*Verbenaceae*). A large Order widely distributed over the New and Old Worlds, but most abundant within the tropics; some of the species furnish valuable timbers.

**CASE 89.** Observe wood of *Petitia domingensis*, Jacq., from the West Indies where it is one of the woods known as FIDDLEWOOD, the name being a corruption of *Bois-fidèle*.

**No. 396.** TEAK (*Tectona grandis*, L.). A deciduous tree attaining a height of 120 to 150 feet, with a girth of 20 to 25 feet. Native of India, Burma, and the Malay Archipelago. This is the chief export timber of India and Burma, and it is also exported from Java, where there exist large plantations of great value. Once seasoned, Teak-wood does not split, warp, or alter its shape; its principal value is its great durability. It is one of the

most useful timber-trees, for ship and railway-carriage building. In India the wood is used for house building, bridges, railway-sleepers, &c., and in Burma it is extensively used for carving. CASE 89.

Various specimens are shown including a musical instrument and screen, carved in it.

**No. 397.** TEAK, quite sound, from Salsette in Bombay, supposed to be 2,000 years old.

The rest of this Case is devoted to species of *Premna* and *Gmelina*, from India and Burma.

The first compartment of this Case is devoted chiefly to specimens of woods and fruits of species of *Vitex*. CASE 90.

On the upper shelves of the next compartment are woods of *Avicennia nitida*, Jacq., from British Guiana, and *A. officinalis*, L., from Queensland. They are sometimes known under the name of WHITE MANGROVE, in consequence of their growing in tidal estuaries near the sea coast.

**Labiata Order (*Labiatae*).** A large and well-marked group of about 3,000 species, prevailing in dry situations in the warmer temperate regions. Marked botanically by the four-angled stem; opposite dotted leaves, whorls of lipped (labiate) flowers, often of great beauty, as in *Salvia*, and a deeply four-lobed dry fruit. The order is devoid of hurtful properties. Many species are highly fragrant and aromatic, as Sage, Pennyroyal, Lavender, Peppermint, Marjoram, &c., specimens of which, with many essential oils, are here exhibited.

Observe rosaries made of beads turned from the roots of **TOOLSII** (*Ocimum sanctum*, L.) a plant cultivated throughout India, sacred to Vishnu and held in great veneration. The beads are worn round the necks and arms of the Vishnu Brahmins. In North Queensland the leaves are crushed in water which is drunk by the natives in fever and sickness; dried, the white people make 'bush tea' of them.

Note also seeds of *Hyptis spicigera*, Lamk., an annual; probably a native of America, but also widely spread in Tropical Africa. The seeds have been occasionally imported into this country, both from the East and West African Coasts, as oil seeds.

**CASE 90.** Near these are shown tubers of *Plectranthus madagascariensis*, Bth., and of *Coleus parviflorus*, Bth., the former occasionally cultivated in Madagascar and Mauritius as an article of food, and the latter in Java for the same purpose.

**No. 398.** LAVENDER OIL is distilled from the flowers of *Lavandula vera*, DC. A native of the South of France, Spain, North Italy, and other parts of the Mediterranean. It is cultivated extensively in the neighbourhood of Mitcham in Surrey, as well as in Lincolnshire. The oil distilled from the plants grown at Mitcham is considered the finest quality, and fetches the highest price. It is chiefly used in perfumery.

**No. 399.** PATCHOULI, the essential oil of *Pogostemon Heyneanus*, Bth. [*P. Patchouli*, Pell.], a plant of India. A powerful perfume, not so much used in this country at the present day as formerly.

**No. 400.** JAPANESE PAPER, steeped with "Yegoma," oil, obtained from the seeds of *Perilla ocymoides*, L., made to imitate leather, and used for walls of rooms, book-binding, &c., also for water-proof papers for windows, umbrellas, &c. Seeds of *P. ocymoides*, L., and oil expressed from them in Japan, are shown.

Observe herb of PENNYROYAL (*Mentha Pulegium*, L.), carminative and stimulant. SPEARMINT (*M. viridis*, L.), also used as a carminative, as well as for flavouring. Oil is distilled from this plant chiefly in the United States, where it is used as a perfume by soap makers.

On a lower shelf are specimens of Japan Peppermint (*Mentha arvensis*, L. var.), and oil. Also MENTHOL, or Peppermint Camphor, the crystalline portion of the oil, used in neuralgia and as an antiseptic.

**No. 401.** PEPPERMINT (*Mentha piperita*, L.). A well known perennial, a doubtful native of this country, but extensively cultivated for medicinal purposes in the neighbourhood of Mitcham, Lincoln, Cambridge, and Herts. Two forms of Peppermint are cultivated at Mitcham, one known as the Black Mint, and the other the White Mint, both of which are forms of *M. piperita*, var. *officinalis*. The white yields the best oil. Peppermint is

largely grown in America, France, Germany, Russia, &c. CASE  
It possesses aromatic properties, and the oil is used in 90.  
medicine, cordials, lozenges, &c.

On the upper shelves of the first compartment of this CASE  
Case are specimens of SWEET MARJORAM (*Origanum* CASE  
*Marjorana*, L.), of THYME (*Thymus vulgaris*, L.), and on 91.  
a lower shelf SAGE, the foliage of *Salvia officinalis*, L.,  
all culinary herbs.

Note also PHASKOMYLIA TEA, the leaves and twigs of  
*Salvia triloba*, L., as sold in Athens; also SAGE APPLES,  
galls formed on *S. triloba* from the puncture of *Cynips*  
*Salviae*, eaten as fruits at Athens. Observe also CHIA  
SEEDS (*Salvia Columbariae*, Bth.), used in North America  
in the preparation of a mucilaginous drink.

The adjoining shelves contain specimens of the dried  
plants of ROSEMARY (*Rosmarinus officinalis*, L.), which  
yields an oil used in perfumery and medicine, both in  
this country and in India.

Observe also AMERICAN HORSE MINT (*Monarda*  
*punctata*, L.). Employed in medicine in the United  
States of America as a stimulant and carminative.

On the upper shelves of the next compartment note  
CAT MINT (*Nepeta Cataria*, L.). It has tonic and anti-  
spasmodic properties and, like the last mentioned, is used  
medicinally in the United States of America.

Also HOREHOUND (*Marrubium vulgare*, L.), a tonic  
and aromatic stimulant, sometimes used in the form of  
tea or candied with sugar.

Near this observe tubers of CROSNES or CHINESE  
ARTICHOKE (*Stachys Sieboldii*, Miq.). Introduced into  
this country in 1885 as a new esculent, and also cultivated  
in France for the Paris markets.

**Plantago Order** (*Plantagineae*). A small order of  
herbs widely spread over the globe, but principally in the  
temperate regions of the Old World.

**No. 402.** ISPAGHUL, or SPOGEL SEEDS (*Plantago*  
*ovata*, Forsk.). An annual, found wild in North-western  
India, and cultivated for the seeds, which are of a greyish  
pink colour, and boat shaped. They have neither taste  
nor smell, but are extremely mucilaginous, yielding a

CASE 91. thick jelly in water, and are highly valued in India for their demulcent properties.

**Marvel of Peru Order** (*Nyctagineae*). A group of herbs, shrubs, or trees, natives chiefly of Tropical America. The order has but little economic value.

Note roots of *Boerhaavia repens*, L., a widely distributed medicinal herb of India, Ceylon, &c. In India the roots are employed in the treatment of asthma, and as a laxative, diuretic, and anthelmintic.

In the order *Illecebraceae* note THE ARABE or ALGERIAN TEA, the flowers of *Paronychia argentea*, Lam., and *P. capitata*, Lam., used as a medicinal tea in Algeria, and sold in Paris.

Also SERGENA ROOTS (*Corrigiola littoralis*, L.). They are dried in quantities at Arzilah, Morocco, for export as a dye.

In the Amaranth Order (*Amarantaceae*) observe seeds of *Amaranthus paniculatus*, L., and *A. gangeticus*, L., cultivated throughout India and Ceylon for use as food.

CASE 92. **Goosefoot Order** (*Chenopodiaceae*). A group of herbaceous, weed-like plants, with insignificant flowers, growing in waste places all over the world; least numerous in hot climates. Some, as Spinach and Orach, are used as pot-herbs.

**No. 403.** Models of varieties of BEET-ROOT, red and white, of market gardens. All forms, originated under cultivation, from a native seaside plant *Beta vulgaris*, L.

**No. 404.** BEET-ROOT SUGAR. Several varieties of Beet are cultivated in Europe and North America for the production of sugar. During the year 1905, 8,182,108 cwts. of unrefined Beet-root Sugar of the value of £4,368,867 were imported into the United Kingdom from the Continent, of this quantity 5,510,108 cwts. came from Germany and 1,054,998 cwts. from Belgium.

**No. 405.** Models of roots of MANGOLD WURZEL, a cultivated variety of the Beet (*Beta vulgaris*, L.).

In the next compartment observe specimen of SPINACH (*Spinacia oleracea*, L.), prepared by Messrs. Chollet's process.



**No. 406. QUINOA.** The farinaceous seeds of *Chenopodium Quinoa*, Willd., an important article of food on the slopes of the Andes of Chili, Peru, and Central America.

Note wood of the SACSAOUL (*Haloxyylon Ammodendron*, Bunge), a small tree, with the habit of a conifer, of Western and Central Asia in the Kizil-Koumi desert; it forms small forests, and the wood, which is so dense as to sink in water, is prized for fuel and also yields a green dye.

Note samples of BARILLA, an impure carbonate of soda, formerly an article of considerable commercial importance in soap and glass making. It was obtained from the ashes of several species of *Salsola* principally *S. Soda*, L., a South European and North African species. One of the samples exhibited is from Spain, obtained from *Halogeton sativus*, Moq. A mounted specimen of the plant is also shown. Near these observe a cake of Barilla prepared from *Suaeda fruticosa*, Forsk., at Bir Ahmed near Aden, also specimens of Barilla from Sind known under the name KHARSUGI and believed to be derived from a species of *Salsola*.

On the middle shelf are tubers of *Ullucus tuberosus*, Caldas, cultivated in Peru and Bolivia under the name of OCA-QUINA as a regular article of food.

Under the **Poke-weed Order** (*Phytolaccaceae*), observe sections of the stem of *Phytolacca dioica*, L., the BELLA SOMBRA, an umbrageous tree of South America, introduced into Spain, where it is planted as a shelter in public promenades.

Note also fruits and roots of *P. decandra*, L., a North American species, with emetic, cathartic and narcotic properties.

**Buckwheat Order** (*Polygonaceae*). Mostly herbaceous plants, marked by the membranous sheath at the base of the stalk of their alternate leaves. Widely diffused; many are common and troublesome weeds, as the Dock and Knotgrass.

On a lower shelf note abortive flowers of PHOG (*Calligonum polygonoides*, L.). Used in Afghanistan,

**CASE 92.** Punjab, and Sind as an article of food, either made into bread or cooked with ghee.

**CASE 93.** In the first compartment of this Case observe roots of **BISTORT** or **SNAKEWEED** (*Polygonum Bistorta*, L.), a perennial herb in moist or swampy meadows in this country. The root or rhizome is a powerful astringent, and was formerly used in medicine as a gargle and injection.

Also note on the upper shelves specimens of **CHINESE INDIGO** plant (*Polygonum tinctorium*, Ait.), known as Tjok in Corea, with samples of indigo prepared from it. The plant is also commonly cultivated in Japan, and is the source of Mandschurian Indigo.

**No. 407.** **BUCKWHEAT** (*Fagopyrum esculentum*, Moench). Long cultivated on the Continent of Europe, and generally in temperate countries, for its farinaceous seeds, from which an excellent bread is made; it forms a staple food of the inhabitants of the Himalaya and Central Asia. Often planted in Britain for feeding game and poultry. Its native country is probably Russia or Western Asia. Specimens of seeds are exhibited from Japan, East Indies, New Brunswick, &c.

The seed husks are commonly used as a packing material.

Samples of **KANGRA BUCKWHEAT** (*Fagopyrum tataricum*, Gaertn., var. *himalaica*, Batalin.) are here shown. It is grown as a hill crop in Kulu and is very rich in nutrient constituents. The typical plant (*F. tataricum*, Gaertn.) is cultivated throughout the Himalaya, at elevations of 3,000 to 12,000 feet.

**No. 408.** **RHUBARB**, an important medicine, valuable for its mild purgative properties. As it appears in commerce it consists of the dried root deprived of more or less of its cortex, the bulk of the drug being derived from species of *Rheum* natives of China and Tibet, of which the following are the principal:—

1. *Rheum officinale*, Baill., a striking plant, with a tall loose inflorescence of white flowers, 7 to 8 feet high, found in the mountainous district of the Szechuan-Tibetan border. From the latest information upon the subject it appears probable that the bulk of **TA HUANG**

or Medicinal Rhubarb exported from China, by sea to foreign countries, is the produce of this species. *R. officinale* was first grown in this country in 1873 by the late Daniel Hanbury, since which time it has been cultivated at Bodicote near Banbury, and the roots have found their way into commerce.

2. *Rheum palmatum*, L., var. *tanguticum*, a large perennial herb of the Western Alpine region of Western Kansuh, where it is also cultivated for the drug. This species was first found wild in 1872-73 by Col. Przewalski in the Tangut district of Kansuh, the extreme north-western province of China, whence it was long known that the root was procured. This is probably one of the sources of the product, formerly known in commerce as Russian or Turkey Rhubarb.

3. *Rheum Rhaponticum*, L., a well-known species, cultivated in our gardens for the acid leaf stalk, used for culinary purposes, and generally called English Rhubarb, is a native of Southern Siberia, and is known to have been cultivated at Padua early in the 17th century, from whence it was brought to England, the first plant being raised about the year 1628. It is largely cultivated at Bodicote for medicinal purposes. Fine samples of Rhubarb of different qualities and from different countries are exhibited, also roots of other species of *Rheum*, besides those mentioned above.

During the year 1904, China exported to Europe and America 9,648 cwts. of this drug, of the value of £14,044.

Observe on a lower shelf of the middle compartment of this Case roots of CANAIGRE or GONAGRA (*Rumex hymenosepalus*, Torr.), a plant found abundantly in the sandy soil of both sides of the Rio Grande, and northward over a large portion of Western Texas and New Mexico. The roots are much used as a tanning material and contain a large proportion of tannin.

In the next compartment note fruits and wood of the SEASIDE GRAPE of Jamaica (*Coccoloba uvifera*, L.). When ripe the fruits are edible, but very astringent. The wood is used for fancy work and takes a fine polish.

**Podostemon Order** (*Podostemaceae*), moss-like plants growing in fresh water, chiefly in tropical countries.

**CASE 93.** Some fine specimens of *Hydrostachys imbricata*, A. Juss., from Madagascar, are here shown.

**No. 409.** SALT, called *Caarura*, from the Uapès branch of the Amazon. Prepared from a *Podostemaceae*.

**CASE 94.** **Pepper Order** (*Piperaceae*). A large family of jointed herbs or shrubby plants, with minute flowers borne on spikes. They grow in the hottest countries of the globe, chiefly Tropical America and India. Many species are pungent and aromatic.

On the upper shelves of the first compartment observe **AFRICAN CUBEBS** (*Piper Chusii*, C. DC.), and **ASHANTI PEPPER** or **DOJVIE** (*Piper guineense*, Schum. & Thonn.). The fruits of both species are employed by the natives of the West Coast of Africa as condiments. Note also **CUBEBS**, dried fruits of *Piper Cubeba*, L. fil., and Cubeb oil and Cubebine used in medicine.

**No. 410.** **PEPPER; BLACK and WHITE.** The fruit of *Piper nigrum*, L., a climbing Indian shrub, cultivated in India, Straits Settlements, Malaya and elsewhere in the tropics. Black Pepper consists of the dried unripe berries; White Pepper is the ripe fruit deprived of its rind by macerating. Various specimens of both Black and White Pepper are exhibited. 18,563,635 lbs. of Pepper of the value of £481,371 were imported into the United Kingdom in 1905. Nearly half of this quantity came from the Straits Settlements.

Observe **LONG-PEPPER**, the dried unripe fruit-spikes of *Piper Chaba*, Hunter, and *P. longum*, L., Indian shrubs.

**No. 411.** **MATICO.** The coarse leaves of *Piper angustifolium*, R. and P., a Peruvian shrub, used as a mild aromatic. A portion of the leaf or the leaf reduced to powder is very effectual in arresting hæmorrhage.

**No. 412.** **KAVA ROOT** (*Piper methysticum*, Forst.), used in the Society and South Sea Islands, in the preparation of a beverage, prepared by chewing the root and ejecting the saliva into large bowls, in which it is fermented, &c. In the Society Islands the plant is cultivated with great care, the root, which is dried and looks something like very large horse-radish, is pounded.

between two stones; it is then put into a wooden bowl (which after long use acquires a bluish, almost iridescent glaze, and is then much prized) and water is poured upon it; it is then kneaded and the disintegrated *débris* is finally removed by drawing a bundle of Pandanus fibre through the liquor, which is then fit for drinking. It is slightly intoxicant or narcotic and tastes like soapsuds; but the taste for it seems to be easily acquired and it is said to quench the thirst better than any other liquid. In Samoa and elsewhere in the Pacific the root is cut into small pieces, and masticated into a paste before the addition of water.

The active properties of *Piper methysticum* appear to be due to a resin, which like Cocaine, produces local insensibility.

Note KAVA BOWLS from Samoa and Fiji.

**Nutmeg Order** (*Myristiceae*). Evergreen trees confined to the tropics, often characterised by their red viscid juice and aromatic properties.

Observe fruits and seeds of various species of *Myristica* occasionally imported into Liverpool as oil seeds, amongst them *M. surinamensis*, Roland, *M. angolensis*, Welw., *M. guatemalensis*, Hemsl. Butter obtained from seeds of *M. Otoba*, H.B., from Antioquia, and seeds, mace and butter from *M. malabarica*, Lam., from India.

**No. 413.** NUTMEGS, the seeds of *Myristica fragrans*, Houtt. A beautiful tree of the Moluccas, scattered also in other islands of the East Indian Archipelago, and introduced into Mauritius, West Indies, and South America. The fruit of the nutmeg, which resembles a Peach, consists of a fleshy exterior, which is edible and splits into two, disclosing the solitary seed or nutmeg surrounded by the scarlet aril, which latter is the spice called MACE. Specimens preserved in fluid show the entire fruits, some of which are partly open, exhibiting the shell of the nutmeg and the MACE covering it.

Other species allied to *M. fragrans* yield inferior Nutmegs. Observe instrument used in Banda for gathering nutmegs from the trees. "By far the largest supply of nutmegs are derived from the Banda Islands. These are all at first shipped to Batavia."

**CASE 94.** During 1904, 433,432 lbs. of Nutmegs and 155,856 lbs. of Mace were exported from Java. The principal consumption of nutmegs is as a condiment, but they are also used in medicine for their aromatic and stimulant properties.

**No. 414.** Concrete OIL OF NUTMEG, obtained in the Moluccas, from the seeds, by heat and pressure.

**CASE 95.** **Pitcher-Plant Order** (*Nepenthaceae*). A small but strange group of plants of South-Eastern Asia, especially remarkable for the prolonged midrib of the leaf, which is hollowed in the form of a pitcher and surmounted by a lid-like expansion. "Pitchers" of several species are exhibited; among them *Nepenthes Rajah*, Hook. f., the largest known; *N. Edwardsiana*, Low; *N. sanguinea*, Ldl.; *N. Lowii*, Hook. f., and *N. khasiana*, Hook. f.

**CASE 96.** On the upper shelves of the first compartment of this Case note pitchers of several species of *Nepenthes* including *N. Northiana*, Hook. f.

Under the **Rafflesia Order** (*Cytinaceae*), which consists of fleshy herbs parasitic upon the roots of other plants, observe *Cytinus Hypocistis*, L., the only European representative.

**No. 415.** Flowers of *Rafflesia* (*R. Patma*, Bl., and *R. Arnoldi*, Br.). Of the latter, the largest flower in the world, see a model in wax, in a table-case, near Case 81 on the middle floor; it is a native of Sumatra, and consists of a flower alone, which grows parasitically on the trailing stems of a kind of vine.

**Birthwort Order** (*Aristolochiaceae*), natives of the tropical parts of both hemispheres, with bitter and acrid properties.

Observe ASARABACCA LEAVES (*Asarum europaeum*, L.), formerly used as a purgative and emetic medicine.

Also ALPAM ROOT (*Bragantia Wallichii*, R. Br.), used for the treatment of snake bites in India. Specimens are also shown of GUACO, the roots of unknown species of *Aristolochia* from Central America, where they have a reputation for the cure of snake bites. [See also GUACO (*Mikania amara*), Willd., Case 67, p. 128.]

**No. 416. VIRGINIAN SNAKE ROOT** (*Aristolochia Serpentaria*, L.), a native of moist fertile woods in the United States of America. At one time it had a reputation for the cure of the bites of venomous serpents, as its common and specific names imply. It is now used as a stimulant tonic. CASE 96.

Observe on the bottom shelf flower of *Aristolochia gigas*, L., var. *Sturtevantii*, modelled from a plant grown in the Royal Gardens.

In the last compartment of this Case note the remarkably large flower of *Aristolochia Goldieana*, Hook. f., from West Tropical Africa, together with a photograph of the flower produced in the Royal Gardens. Also roots of Jamaica CONTRAYERVA (*Aristolochia odoratissima*, L.), used both as an alexipharmic and vermifuge.

**Australian Sassafras Order** (*Monimiaceae*). Trees, shrubs, or woody climbers chiefly natives of South America, represented also in the Mascarene Islands, Tropical Asia, New Zealand and Australia.

**No. 417. BOLDO LEAVES** (*Peumus Boldus*, Molin.). The Boldo is a shrub 10 to 20 feet high, native of Chili, and frequently grown in gardens for the sake of the agreeably scented flowers and fragrant evergreen leaves. These leaves are used in medicine for the purpose of assisting digestion. The fruit is sweet and is eaten in Chili, and the bark is used for tanning.

Observe bark of *Atherosperma moschatum*, Lab., a large tree of Victoria and Tasmania. The bitter aromatic bark is used for making a kind of tea. It affords an essential oil, two drops of which it is said will almost stay the heart's action.

Note also wood of *Doryphora Sassafras*, Endl., also a large tree, native of New South Wales. An infusion of the bark is used as a tonic medicine. Both these trees are known as AUSTRALIAN SASSAFRAS.

**Laurel Order** (*Laurineae*). Fine trees, principally of cool islands and mountain slopes within the tropics. But one species, the Sweet Bay Laurel, is native of Europe. The stamens are remarkable for the mode in which their anthers open, by little valves or doors, as in the Barberry. CASE 97.

CASE  
97.

In the first compartment note fruits of *Cryptocarya Peumus*, Nees. They are cooked and used as food by the poorer natives of the province of Aconcagua, Chili.

Observe wood of TARAIRE, (*Beilschmiedia Tarairi*, Bth. and Hook. f.=*Nesodaphne Tarairi*, Hook. f.), and TAWA (*B. Tawa*, Bth. and Hook. f.), both large New Zealand trees.

Near these are specimens of MASSOY BARK (*Massoia aromatica*, Becc.), from the forests of Southern New Guinea; the aromatic bark is an article of commerce amongst the Malays.

On the lower shelves note woods of several species of *Cinnamomum*, including *C. Cecicodaphne*, Meissn., which has a strong camphoraceous odour, *C. inunctum*, Meissn., *C. obtusifolium*, Nees, and *C. tavoyanum*, Meissn., from India and Burma.

On the upper shelves of the next compartment, specimens are exhibited of the wood and bark of CASSIA LIGNEA or CASSIA CINNAMON (*Cinnamomum Tamala*, Nees), an evergreen tree of India, where the aromatic bark is collected and sold under the name of TAJ, as a substitute for, or as an adulterant of, true Cinnamon. The leaves are known as TEZPAT or TEJPAT and are used in medicine, and also to flavour curries.

Note buds and bark of *Cinnamomum iners*, Rwdt., from the East Indies. This species is said to produce the Cassia Buds collected in Southern India.

**No. 418.** CINNAMON, the bark of *Cinnamomum zeylanicum*, Breyn., a tree of Ceylon. Specimens of unbarked branches, affording the different qualities of this valuable spice, with the instruments used in peeling it, are exhibited, also a series of photographs illustrating the growth and preparation of Cinnamon in Ceylon. 871,642 lbs. of Cinnamon of the value of £24,031 were imported into the United Kingdom in 1905.

**No. 419.** CASSIA BUDS. The unripe fruits of *Cinnamomum Cassia*, Bl., a tree of Southern China, used as a spice, chiefly in confectionery.

Another CASSIA LIGNEA, or CHINESE CASSIA as it is sometimes called, is the bark of the tree that yields Cassia Buds. Specimens are exhibited, of different ages and



qualities, from Pakhoi and from Tai-wu and Luk-po in Southern China. Cassia Bark is used in the same way as cinnamon, it is, however, more astringent. Note instruments used in collecting the bark, also samples of Cassia oil. CASE  
97.

**No. 420.** CAMPHOR, obtained by distillation from the wood of *Cinnamomum Camphora*, Nees, a tree of Formosa, Japan and China. It is also cultivated in India and Ceylon. In the latter country successful experiments have recently been carried out for extracting Camphor from the leaves and twigs. Camphor of commerce is obtained from the root, trunk, and branches, broken up and heated with water in closed vessels, the volatilised Camphor being sublimed upon Rice-straw. It is further refined on its arrival in Europe. Samples of crude and refined Camphor are shown, also specimens of Camphor wood and Camphor oil. From this oil, Safrol, the prevailing ingredient of Oil of Sassafras Root [No. 423], is largely prepared in Germany. (See also SUMATRA CAMPHOR, Case 11, No. 64, p. 24.)

In the first compartment of this Case observe specimens of the Muga, or Moonga silk and silkworms (*Antheraea assama*, Helf.). The insect feeds on the leaves of several Indian trees, amongst them *Machilus odoratissima*, Nees, the wood of which is used for building purposes. CASE  
98.

**No. 421.** AVOCADO PEAR, the fruit of *Persea gratissima*, Gært. Grown in Tropical America, the West Indies (where it is much esteemed), and in the Atlantic Islands. Note also the wood of this plant.

**No. 422.** NAN-MU WOOD (*Persea Nanmu*, Oliv.). This wood is highly esteemed by the Chinese on account of its great durability, and is employed by them for making coffins, buildings, bridge work, book-cases, &c. A model of a coffin made from the wood is exhibited.

Note wood, bark, and fruits of one of the trees known as COMINO in Colombia (*Aniba perutilis*, Hemsl.). The wood is beautifully marked, and possesses exceptional qualities to recommend it for high class furniture and also for building purposes.

**CASE 98.** On the lower shelves observe **STINKWOOD** (*Ocotea bullata*, E. Mey.). A valuable South African timber, both strong and durable, and having a very disagreeable odour: used for building purposes, wagon work, cabinet making, &c.

On the outside of the Case is a large washing bowl cut from the solid trunk of a tree of *Ocotea foetens*, Bth. and Hook. f., from Madeira. It is the **TIL** of the evergreen forests.

**No. 423.** Root-bark, root, wood, and pith of **SASSAFRAS** (*Sassafras officinale*, Nees). A fine tree of the United States and Canada. Used in medicine as an aromatic and sudorific. Sassafras owes its properties to a volatile oil, of which the root bark contains twice as much as the wood; the prevailing constituent of this oil is **Safrol**. This oil is employed as a flavouring agent and for scenting soap.

The wood is durable in contact with the soil and is largely used in North America for fencing and for coeprage.

Observe **PICHURIM** or **PUCHURY BEANS** (*Nectandra Puchury*, Nees). They are aromatic, and are used as a tonic and astringent and are occasionally imported into this country from Brazil.

**No. 424.** Wood of the **GREENHEART** (*Nectandra Rodioei*, Schk.), a remarkably hard timber, of British Guiana, highly valued for its strength and durability. Note portions of old piles of this wood showing that the heart wood is not liable to attacks of *Teredo*. Note also fruits of the Greenheart, and sulphate of Bebeerine. The bark occasionally enters commerce as **BEBERU** or **BIBIRU** bark for use as a tonic medicine and comes from British Guiana.

The next compartment contains chiefly fruits and woods of various species of *Litsea*.

**No. 425.** Leaves and Fruit of the **SWEET BAY** (*Laurus nobilis*, L.). The classic Victor's Laurel, sacred to Apollo. A South European shrub. The aromatic leaves are employed in cookery. From the berries a green odorous oil is obtained, sometimes used in perfumery.

Observe also the filiform, or wiry twining stems of species of *Cassytha*, a group of leafless parasites found in tropical regions. CASE 98.

**Protea Order** (*Proteaceae*). Abounding in Australia and at the Cape of Good Hope, with a few outliers in India and South America. Termed *Proteaceae* from the extraordinary diversity in structure of their often beautiful inflorescence and of the fruit. They do not furnish many useful products. The wood, which seldom reaches a large size, is prettily marked by its peculiar "silver grain." Numerous specimens are exhibited in this Case, also in Case 99.

Note wood and fruits of the SILVER TREE (*Leucadendron argenteum*, R. Br.), which in its native state is confined to a slope of the Table Mountain close to Cape Town.

In the next compartment note wood and flowers of various species of *Protea*, likewise from South Africa.

On a lower shelf are specimens of the hard, heavy, and prettily grained wood, of TERBLANZ (*Faurea saligna*, Harv.), from Cape Colony and Uganda.

**No. 426.** WILD ALMONDS, fruits of *Brabejum stellatifolium*, L., a native of South Africa, where the seeds are eaten raw, and when roasted and ground, used as a substitute for coffee.

Near these are the edible seeds of *Gevuina Avellana* Molina, from Santiago, and of the QUEENSLAND NUT (*Macadamia ternifolia*, F. Muell.). The wood of the latter species is used in Australia for cabinet making, shingles, staves, &c.

Note also WOODEN PEARS (*Xylometum pyriforme*, Knight), so called from the extreme hardness and form of the fruits.

In the next compartment are shown specimens of the wood of the SILKY OAK of Australia (*Grevillea robusta*, A. Cunn.). A beautifully marked wood valued in the Colony for cabinet work and occasionally exported to this country for similar purposes.

The remainder of this Case contains fruits and woods of various species of *Hakea* and *Banksia* from Australia.

**CASE 99.** The first two compartments of this Case are mainly devoted to mounted cones and sections of woods of a large number of species of AUSTRALIAN HONEYSUCKLE (*Banksia*), a genus endemic in Australia.

**Spurge-Laurel or Lace-bark Order** (*Thymelaeaceae*). A family of shrubby plants, with remarkably tenacious inner bark (*liber*) and caustic juice, represented in our gardens and greenhouses by *Daphne Mezereum*, *Pimelea*, &c.

In the last compartment of this Case observe specimens of bark of MEZEREON (*Daphne Mezereum*, L.). A slender straggling shrub, found in some parts of Britain and distributed throughout the sub-alpine districts of Europe. The bark which is very acrid is used in medicine, and for this purpose is imported chiefly from Germany; near this are shown barks of the SPURGE LAUREL (*Daphne Laureola*, L.), and SPURGE FLAX (*D. Gnidium*, L.), used medicinally for the same purposes as *D. Mezereum*.

**No. 427.** Fibrous bark of *Daphne cannabina*, Wall., a tall evergreen shrub of the Himalaya and Khasia Hills, also "Half-stuff" and paper made from it, of various qualities and in different stages of manufacture. Nepal and Bhutia paper are made from this bark, which is also converted into rope for various purposes.

Some models are shown illustrating the manufacture of paper in India. *Daphne* paper is in common use in Northern India. It is extremely strong and durable, and the finer qualities are well suited for engravings.

**CASE 100.** On the upper shelves of the first compartment of this Case are specimens of the wood and bark of the BURN-NOSE or BONACE of Jamaica (*Daphnopsis tinifolia*, Griseb.). The inner bark is very fibrous, and is used for ropes, cordage, &c.

Note also paper made in Japan from *Edgeworthia Gardneri*, Meissn. Some of the finer kinds of NEPAL PAPER are said to be manufactured from this plant, which is found in the Central and Eastern Himalaya and Bhotan.

Specimens are also shown of paper made from *Wikstroemia viridiflora*, Meissn., from Pakhoi, China.

**No. 428.** Stem, with the bark-layers partly turned back, of the JAMAICA LACE-BARK (*Lagetta lintearia*, Lam.), a tree of from 23 to 30 feet. The lace-layer is carefully removed through considerable lengths of the stem, and when pulled open made up in various ornamental articles,—collars, purses, &c. CASE  
100.

On the upper shelves of the next compartment, note fibrous bark of *Lasiosiphon eriocephalus*, Dcne. Also ropes and paper pulp made from the bark which is also employed in India as a fish poison.

**No. 429.** EAGLE-WOOD or LIGN-ALOES. The produce of *Aquilaria Agallocha*, Roxb., and *A. malaccensis*, Lamk. Both large evergreen trees, the first of Eastern Himalaya, Assam, Khasia and Martaban Hills and the latter of Malacca, Tenasserim and the Malay Islands. The woods are white, soft, and even grained, and when freshly cut give off a perfume. In the interior of old trees irregular masses of darker coloured and harder wood are found, which are carefully removed and cleaned for commerce. These are known under the name KAYU GARU by the Malays and as AKYAU by the Burmese.

By some writers this substance is considered to be identical with the Aloes Wood of the Bible.

**Oleaster Order** (*Elaeagnaceae*). Consisting of a few trees or shrubs with their leaves more or less covered, especially beneath, with minute silvery scales. They are chiefly Asiatic or European.

**No. 430.** TREBIZONDE DATES, the fruit of *Elaeagnus angustifolia*, L., a small tree widely distributed in Northern Asia, extending to Europe. The fruits are used as dessert, in the preparation of sherbet, and in Yarkand for the distillation of spirit.

**No. 431.** BUFFALO BERRIES, the fruits of *Shepherdia argentea*, Nutt., a somewhat spiny shrub of North America. In July and August it is sometimes loaded with bright red pellucid berries, which have the acidity and flavour of the red currant. They are used for making tarts and preserves.

**CASE 100.** **Mistletoe Order** (*Loranthaceae*). A remarkable group of shrubs, almost invariably parasitical upon other plants, with leaves usually opposite, thick, and fleshy. In tropical countries numerous species abound, some with large, brilliantly coloured flowers. These have not yet been introduced into our hot-houses. In Europe, the Order is represented by the MISTLETOE (*Viscum album*, L.).

Observe gum of the FLAME TREE (*Nuytsia floribunda*, R. Br.), a tree endemic in Western Australia.

Note on a lower shelf specimens of FLORES DE PALO or WOOD FLOWERS from Guatemala. These curious growths are the matrices of dead *Loranthus*, and are occasionally offered for sale in this country as curiosities.

**CASE 101.** **No. 432.** Sections showing the mode of union which takes place between the wood of the Mistletoe and that of the Apple, Thorn, and Lime trees, upon which it generally grows. These parasites, frequently decaying after death, before the stock upon which they grow, leave curiously furrowed moulds or casts, answering to the space occupied by their attachment.

**Sandalwood Order** (*Santalaceae*). Herbs, shrubs, or trees, widely dispersed over the globe.

Specimens are here shown of SANDWICH ISLANDS SANDAL-WOOD (*Santalum Freycinetianum*, Gaud.), and FIJI SANDAL-WOOD (*S. Yasi*, Seem.).

**CASE 102.** **No. 433.** Boxes made of SANDAL-WOOD afforded by an Indian tree (*Santalum album*, L.). The wood is fragrant, and is used to burn as incense in temples and private houses. It is largely used for carving and for ornamental purposes. Observe samples of spotted wood, caused by the growth of adventitious buds and known in Kanarese as NAGA or COBRA and NAWAL KANU or PEACOCK'S EYE. These woods are held in veneration by the Hindus. Note Sandal-wood oil used in perfumery and in medicine, also Chinese JOSS-STICKS in part made of Sandal-wood. Specimens are also shown of Australian Sandal-wood (*Fusanus spicatus*, R. Br., and *F. acuminatus*, R. Br.). The former yields the fragrant Sandal-wood of West Australia, while the latter has little or no

perfume. Observe also the ornamental stones of the fruit of this species, used for necklaces, bracelets, buttons, &c. CASE 102.

Also on a lower shelf observe leaves of BARK BOSCH or CAPE SUMACH (*Colpoon compressum*, Berg.), a South African bush; it is cut over every four or five years and used as sumac in tanning. It gives the peculiar bloom to leather characteristic of Sumac (see No. 164).

Near this, note sample of Tea formed of the leaves of *Osyris arborea*, Wall., from Kumaon. When specially prepared the leaves are said to smell remarkably like ordinary tea, but the infusion has powerfully emetic properties.

**Balanophora Order** (*Balanophoreae*). Under this head are collected a few most anomalous plants of very different structure, agreeing in the absence of green colour and of leaves, and in their parasitism upon the stems and roots of other vegetables.

Note specimens of *Sarcophyte sanguinea*, Sparrm., from South Africa.

**No. 434.** FUNGUS MELITENSIS, of the Old Writers (*Cynomorium coccineum*, Michx.). It was valued by the Crusaders as a styptic, and was used in Malta as a remedy for dysentery. So highly indeed was it valued that the place where it grew was carefully guarded and "even up to a recent date the plant was gathered, and its growth secured by a person specially appointed to the office by the English Government." The plant grows in the Mediterranean region from the Canaries to Syria.

**No. 435.** CANDLES made in Java from the wax secreted by *Balanophora elongata*, Bl.

Note on the lower shelves *Balanophora fungosa*, Forst., from North Australia. Also Cups used by the Himalayan tribes, Tibetans, &c., made from knots formed on the roots of Oaks, Maples, &c., by the parasitical *Balanophora involucrata*, Hook. f. Some of these, esteemed antidotes to poison, fetch a great price.

The last compartment of this Case, as well as a portion of the first compartment of Case 103, contain further illustrations of plants of this Order.

**CASE 103. Spurge Order (*Euphorbiaceae*).** A large family, consisting of about 3,000 species, exhibiting great variety in floral structure, which is very imperfectly represented by our British Spurges. The order is widely diffused, most abundant towards the Equator, especially in South America. Many contain a milky juice, which is often dangerously poisonous. Several species afford invaluable medicines; some, after the removal of their venomous juice, yield excellent farina.

Observe **QUEENSLAND ASTHMA HERB** (*Euphorbia pilulifera*, L.), a common weed in the tropics, employed as a remedy in asthma, bronchitis, and other diseases of the respiratory organs. Near this note **KATTI-MANDU**, the inspissated juice of *Euphorbia trigona*, Haw., employed in India for fixing knives into handles, and for similar purposes.

On a lower shelf are wood and inspissated juice of *Euphorbia antiquorum*, L. The fresh juice is employed in medicine in India as a purgative and for the treatment of rheumatism and toothache.

In the next compartment of this Case note specimens of iron coated with paint prepared from the gum of species of *Euphorbia*. The paint so prepared is said to be durable, and a preservative against corrosion, and is used for ships' bottoms. **GUM EUPHORBIVM**, an occasional article of import into this country, one of the ingredients used, is furnished by *Euphorbia resinifera*, Berg., a fleshy perennial plant of Morocco. It is obtained by making incisions in the plant, when the milky juice flows, and hardens on exposure to the air. It was formerly used as an emetic and purgative, but owing to its violent and dangerous action, it is now seldom employed, except in veterinary practice, and as a rubefacient and vesicant.

Specimens are also shown of the inspissated juice of *Euphorbia Tirucalli*, L., a small tree, native of Africa, cultivated in India and Burma as a hedge plant. This is probably the source of **ALMEIDINA**, **POTATO GUM**, or **CASSONEIRA GUM**, of Angola and Loanda, a poisonous gutta-like substance which soon becomes brittle, but is however believed to be employed as a substitute for Gutta Percha in some industries.



**No. 436. BOXWOOD** (*Buxus sempervirens*, L.). A **CASE 103.**  
 well-known evergreen tree of Europe, growing in some situations in Britain. Its dense, compact wood is admirably suited for the use of wood-engravers, for graduated scales, &c. Specimens of different qualities of boxwood are shown from Persia, Trebizonde, Anatolia, and of British growth; also blocks prepared for wood engraving, one upon which the drawing has been made ready for engraving, and a finished engraved block, also shuttles, walking sticks, rules, &c. Russia and Persia are the principal sources of boxwood of commerce, but the supplies of late years have been decreasing. A hard even-grained wood that would prove a perfect substitute for boxwood has yet to be discovered.

Observe a specimen of **CAPE BOXWOOD** furnished by *Buxus Macowani*, Oliv., a tree about 30 feet high, native of South Africa.

The remainder of this compartment contains various Euphorbiaceous woods, mostly from the East.

**No. 437. Fruits of the EMBLIC MYROBALAN** **CASE 104.**  
 (*Phyllanthus Emblica*, L.), a moderate-sized tree of the Indian and Burmese forests. The fruits are edible, and are used for preserves, in medicine, and for dyeing and tanning. The wood is durable, and is used for agricultural implements, buildings, furniture, &c.

Observe fruits and wood of **OTAHEITE GOOSEBERRY** (*Phyllanthus distichus*, Muell. Arg.), a deciduous tree of the East Indies. The fruits are acid and astringent, and are used either in pickles, preserved with sugar, or in tarts.

On the lower shelf are specimens of bark of **BITTER BARK** or "**QUININE TREE**" (*Petalostigma quadriloculare*, F. Muell.), introduced from Australia as a substitute for *Cinchona*.

It also yields a brownish-yellow dye. The wood is hard and fine-grained and useful for cabinet work.

**No. 438. AFRICAN OAK** or **TEAK** (*Oldfieldia africana*, Bth. and Hook. f.), from Sierra Leone. A fine, close-grained timber, formerly imported into this country for shipbuilding. At the present day this timber is hardly known in commerce. The "**African Oak**" now imported is the produce of *Lophira alata*. [See Case 21.]

CASE  
104.

On the upper shelves of the next compartment of this Case, note specimens of wood of *Bischofia javanica*, Bl., a deciduous tree of India, Burma, Malaya, &c. The timber is hard, heavy and durable, particularly in damp situations, and is recommended for pile foundations and railway sleepers. In Assam it is largely used for bridges and other works of construction.

Note also KOKRA wood of Bengal (*Aporosa Roxburghii*, Baill.), a moderately hard and even-grained wood of a light red colour. The name KOKRA has occasionally been confounded with COCUS [See No. 186].

Observe fruits of *Baccaurea racemosa*, Muell. Arg. They are acid and eaten in Java. Also fruits of LUTQUA (*B. sapida*, Muell. Arg.); these are eaten in India, and have an agreeable acid taste. The leaves are employed as a dye. Fruits are also shown of other edible species of *Baccaurea*, including RAMBEH (*B. dulcis*, Muell. Arg.), from the Malay Islands.

On a lower shelf observe specimens of *Antidesma Bunius*, Spreng., and of *A. Ghaesembilla*, Gaertn., small trees of the East. The leaves and fruits of both species are eaten in India.

Near these note large stones of fruits of *Joannesia Princeps*, Vell. The fruit is about the size of an apple, and of an ash colour. The stones contain two seeds, which yield by expression a pale yellowish oil, used as a cathartic in Brazil.

On the bottom shelf are seeds and oil from the PHYSIC NUT (*Jatropha Curcas*, L.), a bush or shrub of tropical America, but introduced into most tropical countries. The oil expressed from the seeds is a strong purgative. It is employed in medicine in India and is also used in the manufacture of soap and candles.

On an upper shelf of the next compartment are seeds of BALUCANAT (*Aleurites trisperma*, Blanco), from the Philippines. Occasionally imported into this country as an oil-seed.

No. 439. Fruits, seeds and oil from the TUNG YU or CHINESE VARNISH TREE (*Aleurites Fordii*, Hemsl.). The oil known as WOOD OIL is an article of enormous consumption by the Chinese, who use it for caulking and

painting junks preserving wood work, varnishing furniture, &c. CASE  
104.

During the last few years large quantities of this oil have been exported from Hankow to European and American ports, by far the greater quantity going to America. Of 84,501 piculs (the picul=133½lbs. avoirdupois) shipped from Hankow during the year 1905, 49,514 piculs were absorbed by America. So far as can be gathered the applications of Wood Oil in the West are for the manufacture of linoleum, as a substitute for linseed in other industries, and it is also believed to form the basis of a varnish to compete with that produced from Copal. The oil has poisonous properties, and the refuse cake is employed as manure in China.

Note also fruits of *Aleurites cordata*, R. Br., from Hong Kong. The seeds yield an oil similar to that of the last mentioned.

**No. 440.** CANDLE-NUT or COUNTRY WALNUT OIL, from the seeds of *Aleurites triloba*, Forst., a handsome tree widely distributed in tropical countries. The seeds, strung upon a stick, are burnt as candles in the Sandwich Islands. When pressed they yield a large proportion of pure palatable oil.

**No. 441.** CROTON OIL, expressed from the seeds of *Croton Tiglium*, L., a shrub of India and the Indian islands, a powerful purgative; employed externally as a rubefacient.

**No. 442.** SWEET BARK, or CASCARILLA BARK (*Croton Eluteria*, Benn.). It is a native of the Bahamas, is aromatic, bitter, and tonic, and was at one time used as a substitute for Cinchona. On account of its agreeable musky odour when burned it is used as an ingredient in fumigating pastilles. It is sometimes inserted in cigars to give a pleasant odour when smoked.

Note COPALCHI BARK [QUINA BLANCA of the Mexicans] (*Croton niveus*, Jacq.), a shrub, native of Venezuela. This bark has bitter properties and is occasionally imported into Europe as a drug.

**No. 443.** The whole of this Case is devoted to PARA RUBBER, the most important source of Rubber or CASE  
105.

**CASE 105.** Caoutchouc of commerce. It is obtained from incisions made in the trunk of *Hevea brasiliensis*, Muell. Arg., a large forest tree of Brazil, now extensively cultivated in Ceylon and the Straits Settlements. Various samples of the product are shown from Brazil, Ceylon, Straits Settlements, Burma, Gold Coast and Trinidad. Of the many forms from Brazil observe models of animals, bottles, &c., made by moulding the rubber over a clay base which was afterwards broken up and removed. This method of preparing the rubber for commerce is now obsolete. On the lower shelves of the middle compartment note a series of specimens to illustrate the industry in Brazil. Note (1) small axe for tapping the trees; the milk falls into small bowls (2), whence it is poured into a collecting gourd (3), from which it is emptied into a large clay bowl (4). From the latter it is ladled with a *cuvia* or calabash (5), and poured over the round blade of the paddle (6), which is then held in the smoke of the stove (7), the invariable fuel being Urucury nuts (*Maximiliana regia*). This is the mode of production of the black rubber of commerce. Many of the numerous applications of Caoutchouc, including those of hard vulcanised rubber for jewellery, &c., are here illustrated by a large series of specimens presented by the India Rubber, Gutta Percha and Telegraph Company.

The exports of rubber from Brazil during the year 1905 amounted to 31,474 tons, of the value of £13,795,372. The imports of rubber into the United Kingdom from Ceylon during the same period were 60 tons 18 cwts., of the value of £34,594; and from the Straits Settlements 975 tons 14 cwts., of the value of £265,863.

On the lower shelves of the last compartment of this Case are fruits, seeds, and rubber from other species of *Hevea* including *H. Spruceana*, Muell. Arg., from British Guiana, *H. Benthamiana*, Muell. Arg., and *H. lutea*, Muell. Arg., from Brazil. Other important Caoutchoucs are afforded by species of *Landolphia*, *Carpodinus*, &c., Case 75; *Funtumia*, Case 78; *Manihot*, Case 106; *Sapium*, Case 108; *Ficus*, Case 114; and *Castilloa*, Case 115.

**CASE 106.** Note on an upper shelf the dark green wood of SANTAL VERT (*Croton* sp.) from Zanzibar. It is said to be

exported from Zanzibar and Madagascar into India, where it is used for burning the bodies of Hindoos. **CASE 106.**

**No. 444.** Figures carved in wood of *Givotia rottleriformis*, Griff. The wood is exceedingly light, very soft, but even-grained, and is much used in India for making toys as here shown. The seeds yield an oil valuable for lubricating fine machinery.

**No. 445.** CEARA or MANIÇOBA RUBBER and specimen of the plant yielding the rubber (*Manihot Glaziovii*, Muell. Arg.), a South American tree, which has been introduced into India, Ceylon, and many other tropical countries. The tree grows rapidly and yields rubber of excellent quality. Of the specimens in the Case note a complete series of articles and photographs illustrating the cultivation and preparation of rubber in the Nilgiris. Specimens are also shown of the tuberous roots and starch prepared from them.

**No. 446.** CASSAVA or MANDIOCCA Meal, obtained from the root of two species of *Manihot* (*M. utilissima*, Pohl, and *M. palmata*, Muell. Arg.); the former Bitter, the latter Sweet Cassava. **CASE 107.**

The juice of Bitter Cassava, which contains Hydrocyanic (Prussic) acid, is highly poisonous. Cassava is grown chiefly in Brazil, Peru, and on the African Coast,—forming a main article of native food. The roots of Bitter Cassava, which are often large, weighing from 30 to 40 pounds, contain much farinaceous matter. They are grated after washing, the poisonous juice separated by pressure, and the residue made into thin cakes (**No. 447**), which are baked. Prussic acid being volatile, the heat dissipates the remaining poison.

Observe CASSAREEP, the concentrated juice of *Manihot* roots rendered harmless by boiling. It is largely used in the West Indies for culinary purposes, and in this country as the basis for many table sauces.

**No. 448.** TAPIOCA. A very pure form of Starch, which settles from the water employed to wash Cassava meal. It is granulated upon hot plates. A close imitation of Tapioca is prepared from potato starch.

**CASE 107.** No. 449. *Mandiocca* strainers. Long, cylindrical, plaited baskets in which the grated pulp is put after washing and pressed by torsion.

No. 450. *Mandiocca* grater, studded with particles of granite, secured in the tough wooden frame by the viscid juice of *Couma utilis*, Muell. Arg., one of the Dogbanes.

**CASE 108.** Observe on an upper shelf of the first compartment of this Case mounted specimen of plant of *Chrozophora plicata*, A. Juss., a common weed in Indian Cotton fields, and sometimes known as INDIAN TURNSOLE, a purplish blue dye being obtained from the fruits.

No. 451. KAMALA. The red powdery substance obtained as a glandular pubescence from the exterior of the fruits of *Mallotus philippinensis*, Muell. Arg., a small evergreen tree of India, Ceylon, Malaya, &c. Kamala powder is extensively employed as an orange dye for silks, and in medicine as a vermifuge. The fruits, wood and bark are also exhibited. Both the bark and roots are used for dyeing. Waras (Case 36) is sometimes used as a substitute for Kamala.

On a lower shelf observe ENDI cloth made from silk of the Castor oil Silkworm (*Attacus ricini*, Boisd.), much used in Sikkim, Nepal, and Bhotan. Cocoons, moths, and raw silk made by the worm which feeds on the Castor oil plant are shown.

No. 452. CASTOR OIL, obtained by pressure, either with or without some degree of heat, from the seeds of *Ricinus communis*, L., a native originally of India. It is now widely dispersed through tropical and warm countries. Known from antiquity as a valuable laxative medicine. Castor oil seeds vary considerably in size and colour. Specimens showing this variation are exhibited from the East and West Indies, Central Africa, &c. Various samples of oil are also shown.

Note fruits, seeds, and roots of the BOMAH NUT of Natal (*Pycnocoma macrophylla*, Bth.). The fruits are used for tanning purposes, the seeds yield a sweet bland oil, and the roots are employed in medicine as a purgative.

Observe also JAMAICA COB NUTS (*Omphalea triandra*, L.), a small tree exuding a white juice which dries black, and bearing a yellow globose furrowed drupe, called

Noisettier in the French W. Indies and known in Jamaica as pig or hog nut. When ripe the seeds burst from the pericarp; they are eaten raw or roasted. By compression they yield a fine flavoured oil.

Note also fruits, seeds, and oil from the seeds of *Omphalea megacarpa*, Hemsl., from the West Indies. The seeds and the oil extracted from them possess purgative properties.

**No. 453.** Tallow from the seeds of *Sapium sebiferum*, Roxb., largely collected in China for candle-making. The seeds, which are enveloped in the tallow, are steamed, beaten, and sifted. The coarse tallow thus obtained is strained through a cylinder of twisted straw. The candles are usually dipped in wax,—owing to the tallow becoming soft in warm weather. For festivals they are made very large, and ornamented. It is the most common shade-tree in New Orleans, and is said to be the only one which will sustain the vibration of the tram-cars.

Observe wood of the MANCHINEEL TREE (*Hippomane Mancinella*, L.). A tree of moderate size, native of tropical South America and the West Indies. Though of a poisonous character, its power, like that of the Upas, has been much exaggerated. The milky juice of the stem and fruit causes great pain if incautiously handled or allowed to come in contact with the eyes.

In the next compartment note samples of COLOMBIAN SCRAP or VIRGEN RUBBER, TOUCKPONG from British Guiana, and BOLIVIAN RUBBER, believed to be from *Sapium Aucuparium*, Jacq., a widely spread and variable tree of tropical America, but the precise source of this particular rubber is still involved in some doubt.

Specimens are also shown of JUMPING SEEDS, the carpels of *Sebastiana Palmeri*, Rose, from Mexico. Each carpel contains, when fresh, the larva of an insect (*Carpocapsa saltitans*), the movements of which cause the carpel to jump or jerk, especially when placed in a warm situation.

**No. 454.** Fruit of SAND-BOX TREE (*Hura crepitans*, L.). The valves of the fruit separate with much violence when mature and dry. It is a native of the West Indies

CASE and tropical America, sometimes grown as a shade for  
108. Cacao. The seeds contain a purgative oil.

CASE **Nettle Order (*Urticaceae*).** A large and important  
109. group represented in almost every climate by trees, shrubs, or herbs. Their economic properties are very varied. The order is divided into eight tribes as follows:—

TRIBE I. *Ulmeae*.—American and European species of which are valuable timber trees; the English ELM (*Ulmus campestris*, L.), being especially suited for works in damp situations. Specimens of this wood as well as of the North American species *U. fulva*, Michx., *U. americana*, L., and *U. racemosa*, Thomas, are shown.

Observe section of the Wellington Elm, the tree under which the Duke of Wellington stood during part of the battle of Waterloo.

Note also specimens of the beautiful wood of KEYAKI of Japan (*Zelkova acuminata*, Planch.), and boxes made of the wood.

TRIBE II. *Celtideae*.—Under this tribe are exhibited specimens of wood and bark of various species of *Celtis* and *Trema*.

TRIBE III. *Cannabineae*.—The Hop and the Hemp are alone included in this tribe.

CASE No. 455. Samples of HOPS used by brewers; the  
110. dried heads of fruit of *Humulus Lupulus*, L. Remarkable among the great Nettle-tribe for its twining stem. A native of Europe, Russian Asia, and perhaps of England. Cultivated in Germany from the eighth century, and introduced into England under Henry VIII. for the sake of its odorous and resinous cones used in brewing.

Note also TALLIES as used in Hop gardens in Kent and Worcester, and HOP TEA formed of Indian Tea mixed with dried hops.

No. 456. HEMP (*Cannabis sativa*, L.), cultivated in cool climates for its invaluable fibre; in tropical India, &c., for the narcotic resin exuded by the leaves and stem. Hemp grows wild in Northern India and temperate Asia. It was cultivated by the Greeks and Romans, but the Egyptians and Hebrews appear to have been unac-



quainted with it. Specimens of Indian, Russian, Prussian, Spanish, and Italian Hemps are exhibited, with Hempen cordage, &c., from the Royal Dockyards. The separation of the fibrous bark of the stem is brought about by soaking in stagnant water. The preparation of the fibre is quite similar to that of Flax (Case 17). Observe portions of cable of the "Royal George," sunk at Spithead in 1782, and samples of paper made from it.

On the bottom shelf of the middle compartment are Hemp seeds and oil expressed from them.

**No. 457.** BHANG or SIDEE, the larger leaves of the Hemp plant, dried, roughly broken, and mixed with some of the fruits. It is dark green in colour, and has a strong narcotic odour and taste. It is chiefly used in India for smoking, and an intoxicating drink is prepared by infusing it in water. Bhang when mixed with flour, sugar, &c., is made in India into a kind of sweetmeat called "Majoon."

**No. 458.** GUNJAH or GANJA. The dried flowering tops of the female Hemp plant with the resin attached. In Assam Ganja is smoked in a *Chilam*, an earthen receptacle used for ordinary tobacco smoking. A wet rag is sometimes put round the *Chilam* which is held between the hollows of the smoker's hands. The hookah is scarcely, if ever, used; when used it contains no water. To a beginner two or three pulls are sufficient to produce intense giddiness and prostration for five or six hours. Habitual consumers feel no inconvenience but experience a refreshed feeling. Ganja smokers seldom smoke alone; a single chilam does for a number of men. Gunjah, like Bhang, is of a dark greenish colour, and has a faint narcotic smell. It is chiefly used for smoking, and sometimes comes into the English market, where it is known as "Guaza."

HASHISH, which is used as an intoxicant by the Arabs, is a similar preparation.

**No. 459.** CHURRAS or CHARAS, the gum-resin of the Hemp-plant. Chiefly used for smoking. Various samples from different localities are exhibited. Lyall states that for the production of Ganja rich in resin it is essential.

CASE 110. that the ovaries should be abortive; the hypertrophied perianth and bracts then secrete the CHARAS in large quantities. It is therefore necessary in cultivation to eliminate the male plants. The finest Charas is produced in Yarkand and Kashgar. In collecting it men, clothed with leather garments, are said to walk about among the hemp plants, brushing up against them, the gum resin comes off and adheres to the garments, which are then taken off, and carefully scraped.

TRIBE IV. *Moreae*.—On this shelf note cigarettes smoked universally in Burma. They are covered with the leaves of a species of *Cordia*, and filled with a mixture of equal parts of tobacco and finely chopped wood of *Streblus asper*, Lour.

In Siam the bark of this tree, under the name of TON KHOI, is much used in the manufacture of paper. A series of specimens illustrating this industry, as carried on near Bangkok, is shown.

CASE 111. In this Case note specimens of the bark of the PAPER MULBERRY (*Broussonetia papyrifera*, Vent.). A small tree widely distributed in the East, and often cultivated. It is the source of TAPA or KAPA CLOTH of the South Sea Islands prepared in the following manner:—The bark of slender stems is stripped off in ribbons; after soaking in water the outer bark, which is useless, is scraped off. Each ribbon of the white inner bark is beaten into a broad strip of cloth; these are joined together with arrowroot, and beaten together so as to form pieces of any size desired. Note shells used for scraping the bark, and several specimens half prepared, also many examples of finished Tapa cloth, and articles of clothing, &c., made from it.

No. 460 is a portion of a piece which originally measured 2 miles in length by 120 feet wide.

In the middle compartment of this Case, note clubs made of the hard wood of *Casuarina equisetifolia*, Forst., used in Fiji for beating the bark of the PAPER MULBERRY, in the manufacture of Tapa cloth.

Note memorandum books made in Burma of *Broussonetia* paper coated with charcoal of *Cassia Tora*. The

writing is done with a steatite pencil, and can be erased with Betel leaves. CASE 111.

Note in this Case an interesting collection of articles made of *Broussonetia* paper from Corea and Japan. CASE 112.

The first compartment of this Case contains a series of specimens illustrating the manufacture (and various uses) of paper in Japan from the barks of *Broussonetia papyrifera*, Vent., and *B. Kaempferi*, Sieb. CASE 113.

**No. 461.** Portions of branches, rough bark, and bark partially prepared of *B. Kaempferi*, Sieb. Note on the adjoining wall copies of native drawings showing the different processes of paper making.

**No. 462.** FUSTIC (*Chlorophora tinctoria*, Gaud.), a large tree of tropical America and the West Indies. The yellow, close-grained timber is largely used in dyeing, and is chiefly imported from the West Indies and Brazil.

Note wood of IROKO, ROKO, or ODUM tree (*Chlorophora excelsa*, Benth. and Hook. f.) from Upper Guinea; the wood, which has a finely mottled grain, is much used in building on account of its resisting the attacks of white ants.

On the bottom shelf of this compartment are shown fruits of the OSAGE ORANGE (*Maclura aurantiaca*, Nutt.), a North American tree, which has been used as a substitute for the Mulberry in feeding silkworms. Its yellow juice was formerly used by the Indians to disfigure their faces in war time. The wood is known in America as BOW WOOD, and is largely employed for fence-posts, paving blocks, &c.

On the upper shelves of the next compartment are shown Cocoons, Moths, and silk of the SILKWORM (*Bombyx Mori*, L.). The insects feed on the leaves of the WHITE MULBERRY (*Morus alba*, L.), specimens of the wood of which, as well as of the BLACK MULBERRY (*M. nigra*, L.), are also exhibited. The White Mulberry is cultivated in Southern Europe and China for the sake of its leaves for feeding silkworms, and the black chiefly in Europe for its fruit.

Observe CONTRAYERVA ROOT (*Dorstenia brasiliensis*, Lamb.), from Brazil, formerly employed in medicine in this country as a stimulant, tonic and diaphoretic. Note

CASE 113. also roots of *D. Contrajerva*, L., likewise known as CONTRAYERVA, and formerly employed in medicine.

TRIBE V. *Artocarpeae*.—A group of tropical trees or shrubs marked by a milky juice and the large scales (stipules) at the base of each leaf-stalk, which fall and leave a ring-like scar.

Observe the skeletonised leaves of *Ficus religiosa*, L., the PEEPUL or PIPAL tree of India, covered with gelatine and painted upon by Chinese artists. The tree, which is sacred to the Buddhists, is commonly planted by them in Ceylon and Burma, and also by the Hindoos throughout India. Observe photograph of SACRED BO TREE of Anarajapoorra "in all probability the oldest historical tree in the world," it was planted B.C. 288. The Buddhist priests object to "lop it with any weapon" and only distribute to pilgrims the leaves which fall naturally to the ground. Lac is produced in large quantities on the Peepul, specimens of which are shown.

The last compartment contains specimens of wood, &c., of several species of *Ficus* from India, also a specimen of the SYCAMORE FIG (*F. Sycomorus*, L.), a large Egyptian tree affording a fruit used by the Arabs. Its light wood is said to be almost imperishable, and served to make the cases of Egyptian mummies; specimens are shown.

No. 463. Leaves, Wood, Bark, Cordage, and Lac of the BANYAN (*Ficus bengalensis*, L.), one of the most famous trees of India, remarkable for its enormous extension by means of rooting branches. The milky juice is made into birdlime, the leaves are made into platters, specimens of which are shown.

CASE 114. Observe fruits of *Ficus pumila*, L., known as OK-GUE in Formosa. These fruits are much used in Southern China and Formosa for making jelly.

No. 464. FIGS. The well-known heads of fruit of *Ficus Carica*, L., long cultivated in South Europe and West Asia.

Note FIG PIES or CAKES from Greece and Cyprus where they are used as an important article of food.

In the next compartment are samples of Rubber, raw and manufactured, from the ABBA or ABO tree (*Ficus Vogelii*, Miq.) from Lagos.

**No. 465.** INDIARUBBER FIG or CAOUTCHOUC Tree of India and Malaya (*Ficus elastica*, Roxb.). A handsome tree, with firm glossy leaves: often a parlour plant in England. The tree is usually epiphytic, the seeds germinating at the top of forest trees, it sends down innumerable aerial roots, which extend to considerable distances below, giving the tree a wide spreading appearance. This is well illustrated by the accompanying photographs, as well as by some fine photographs on the staircase. CASE  
114.

Observe samples of GETAH RAMBONG from Malacca, GETAH KARET from Sumatra and other forms of rubber obtained from this species from Assam, Java, &c.

In the last compartment of this Case note specimens of BARK CLOTH from Uganda, prepared by beating out the bark of a species of *Ficus*.

Observe a fine series of Lac and Lac dyes. LAC is a resin produced by the puncture of a small hemipterous insect abounding in India on various trees, especially species of *Ficus*, *Butea frondosa*, Roxb., &c. The collection of Lac and its products is continued in the next compartment. Specimens are exhibited of shellac, grain, button, liver, seed, and thread lacs; also a fine sample of bleached lac, sealing wax, into the composition of which lac is a principal ingredient, and various ornaments made from lac in India. CASE  
115.

**No. 466.** Lacquered Work from the Punjab, Scinde, Kashmir, and other parts of India, consisting of jewel cases, pen boxes, &c.

**No. 467.** Concrete Milk and Wood of the COW TREE (*Brosimum Galactodendon*, Don.). It is a native of the South American forests, particularly in Venezuela, where it grows to a height of 100 feet, and often unbranched for 60 or 70 feet. The milk, which is obtained from incisions in the trunk, closely resembles cow's milk. It is said to be wholesome, nourishing, and agreeable in taste, and is largely used by the people as an article of food.

**No. 468.** LETTER, LEOPARD or SNAKE-WOOD (*Brosimum Aubletii*, Poepp.). A tree, often of considerable size, native of Guiana, Northern Peru, Brazil, and

**CASE 115.** Trinidad. The heart-wood is exceedingly hard and very finely marked or mottled with dark blotches, having a fancied resemblance to letters, or the skin of a leopard or snake. The wood is used for inlaying, walking sticks, bows, &c.

**No. 469.** UPAS. Inspissated juice of *Antiaris toxicaria*, Lesch., a large evergreen tree of India and Malaya. The fresh juice is a virulent poison (IPOH), and is used by the Sakais and other aboriginal tribes of the Malay Peninsula to tip their arrows. Note quiver with Ipoh-tipped arrows and bamboo blow pipes from Perak.

**No. 470.** Sacks made in Western India from the bark of *Antiaris toxicaria*, by soaking and beating the trunk until the bark is sufficiently loosened to be removed whole. A portion of the stem remains at the end to serve as a bottom.

**No. 471.** CENTRAL AMERICAN and WEST INDIAN RUBBER from *Castilloa elastica*, Cerv. One of the largest forest trees of the North-east Coast of Mexico, and found also in Honduras, Guatemala, Nicaragua, Guyaquil, &c. It is the ULÉ of the natives. The plant has been introduced into India, Ceylon, and other countries. Several specimens of different qualities of rubber are exhibited.

Observe fruits and seeds of the OKWA or AFRICAN BREAD-FRUIT (*Treculia africana*, Dene.), also fruit of AFFON (*Treculia Affona*, N.E.Br.). The seeds of both species are ground into meal and used as food by the natives of West Tropical Africa.

**No. 472.** BREAD-FRUIT (*Artocarpus incisa*, L.). A staple food of the South Sea Islanders. Introduced into the East and West Indies. Observe biscuits, &c., made of slices of the Bread-fruit ; also Bread-fruit Meal.

**No. 473.** JACK-FRUIT (*Artocarpus integrifolia*, L.). Grown from time immemorial in Southern Asia. The fruit attains an enormous size. Certain varieties are highly esteemed as an article of food by the natives of India. The name "Jack" is derived from the Sanscrit name of the fruit, "Tchackka." Fruits from the East and

West Indies are exhibited. Specimens of the wood, which is valuable for furniture, are also shown. CASE  
115.

In the next compartment are fruits and woods of other species of *Artocarpus*, and on the upper shelves of the next division of the case observe TAMBARAM bark (*Artocarpus elastica*, Reinw.) and specimens of native cloths from Borneo, prepared by beating out the bark.

TRIBE VI. *Conocephaleae*.—Observe wood, bark, and cordage of TRUMPET WOOD (*Cecropia peltata*, L.), a soft-wooded tree of Jamaica. Note also AMBAUBAS, or drum, from Brazil, and a Jamaica rat trap made of the wood. The rough leaves are used in place of sandpaper by the Forest Indians of British Guiana in polishing their weapons.

TRIBE VII. *Urticeae*.—Represented by herbs, or sometimes trees, bearing leaves often formidably armed with stinging hairs. Their economic value depends chiefly on the tenacious fibre of the bark. A few species are used in rustic medicine and cookery. The sting of some East Indian species is dangerous, occasioning great and long-continued suffering.

No. 474. Parasol-cover made of the fibre of the COMMON NETTLE (*Urtica dioica*, L.). The young tops of this plant are used as a pot herb.

Note sections of the extremely light and open-grained wood of a gigantic nettle of Australia (*Laportea gigas*, Wedd.), sometimes exceeding 80 feet in height. From the bark the Aborigines extract fibre, which they employ for their fishing nets and lines.

Note specimens of the silky fibre of the Neilgherry Nettle (*Girardinia palmata*, Gaud.) used in Sikkim for ropes, twine and coarse cloth.

The last compartment of this Case and the first division of the next contain a large series of specimens of CHINA GRASS, RAMIE or RHEA (*Boehmeria nivea*, Gaud.). CASE  
116. There are two forms of this plant, one (*B. nivea*) a temperate plant with leaves white felted beneath, and the other (*B. nivea*, var. *tenacissima*) a tropical plant with larger leaves, which are green on both sides. [See *Kew Bulletin*, Additional Series II, Vegetable Fibres, pp. 52-95.]

CASE  
116.

In the next compartment observe wood and turned articles of *Boehmeria rugulosa*, Wedd., a small evergreen tree of Northern India and Burma. The wood may be easily cut or carved without splitting or warping, and on this account is largely used in India for bowls, cups, plates, and other domestic utensils.

Near these note stems and fibre of *Maoutia Puya*, Wedd., from which cloths, net-bags, fishing nets, &c., are made in India.

**Plane Order** (*Platanaceae*). A small order, consisting only of the genus *Platanus*, moderate-sized trees of Europe, Asia, and North America. Observe the beautifully marked woods of *Platanus occidentalis*, L., the AMERICAN PLANE, used for cabinet work and for musical instruments; and *P. orientalis*, L., the ORIENTAL PLANE, or LACEWOOD, native of Greece, Macedonia, Northern Persia, &c. It is used for cabinet work, turnery, &c., and commonly in Persia for internal fittings.

**Walnut Order** (*Juglandaceae*). Trees or shrubs, important in economic botany from the value of the timber of two or three species, and the fruits of the Walnut and Hickory.

No. 475. HICKORY NUTS (*Carya alba*, Nutt., and *C. tomentosa*, Nutt.), the former species affording the principal supply. They are natives of North America, and the woods are both tough and elastic, especially that of *C. alba*, which is much used for spokes for carriage wheels, shafts, &c. The fruits and woods of several other species, all natives of North America, are shown.

Note also PECCAN NUTS (*Carya olivaeformis*, Nutt.), occasionally to be found in English fruit-shops; the kernels are sweeter than those of the former.

CASE  
117.

No. 476. BLACK WALNUT (*Juglans nigra*, L.). A large tree of North America. The timber is durable, susceptible of a fine polish, and is largely employed both in North America and in this country for furniture, gun-stocks, boat-building, &c.

No. 477. WALNUT WOOD (*Juglans regia*, L.), figured and plain. The chief cabinet-wood of Europe before the



introduction of Mahogany. The tree is widely cultivated, and is also found in the Himalayan forests, the timber being commonly used throughout Kashmir and the Punjab for carvings, specimens of which are shown. Walnut is also the chief wood for gun-stocks, of which specimens are exhibited. CASE  
117.

**No. 478.** WALNUTS, the kernel of the fruit of *Juglans regia*, L., exported from the South of France. Introduced into Europe from the South of the Caucasus and adjoining parts of Russia. Note walnuts preserved in sugar, as used in Japan.

**No. 479.** Walnut Oil, obtained from the kernels; used as an article of food. Expressed with heat, it is a drying oil, much used in the arts.

**No. 480.** Walnut Cake, remaining after the expression of the Oil; used for cattle-feeding in the North of Italy.

**No. 481.** Fruits, wood, and bark of BUTTERNUT (*Juglans cinerea*, L.). A large tree of the United States and Canada. The wood is used for panelling, furniture, &c., and the bark as a yellow dye and cathartic medicine.

On a lower shelf observe wood of *Engelhardtia spicata*, Bl., a large deciduous tree of the Himalaya and Burma. Used for tea-boxes, building purposes, and for carving.

**Myrica Order** (*Myricaceae*). Shrubs or trees, consisting of one genus only, namely, *Myrica*, to which the Sweet Gale of our bogs belongs. They are natives chiefly of North America and South Africa.

Note leaves of SWEET GALE (*Myrica Gale*, L.), and SWEET FERN (*M. asplenifolia*, L.), used in medicine in North America. Also wax, and candles made of the same, from various species of *Myrica* from Colombia.

On the bottom shelf of this compartment are specimens of the fruits, wood, and bark of *M. cerifera*, L., the BAYBERRY or WAX-MYRTLE of North America, and MYRTLE WAX, and candles made of the hard, but brittle wax, of *M. cordifolia*, L., from South Africa.

In the last compartment of this Case are fruits, wood, and bark of *Myrica Nagi*, Thb., a moderate sized ever-green tree of India, Malaya, &c. The fruits, which have

**CASE 117.** an agreeable acid flavour, are eaten and also made into sherbet. In India the bark is used in medicine as an aromatic stimulant and also affords a yellow dye.

**Beefwood Order** (*Casuarineae*). A small group of leafless trees with jointed pendulous twigs. Some of the species afford a wood of extreme hardness, formerly used in the Pacific islands for war clubs, &c.

Note fruits, wood, and bark of BEEFWOOD or FOREST OAK of Australia (*Casuarina equisetifolia*, Forst.), a large evergreen tree of India, Malaya, Australia, &c. The wood is used for fencing, gates, and shingles, and the astringent bark as a dye. The tree is chiefly valued in India from its capability of growing on coastlands close to the sea, thus preventing the encroachments of sand-drifts.

On the lower shelves are fruits of species of *Casuarina*, clubs made from the woods, also a sleeping pillow used by the natives in Fiji to prevent the hair from being disarranged.

**CASE 118.**

In this Case observe the hard wood of *Casuarina suberosa*, Otto & Dietr., which, in common with that of *C. equisetifolia*, is known in Australia as BEEFWOOD and FOREST OAK. The wood is of fine grain and suitable for veneers for cabinet work. This tree is much valued in the interior districts of Australia as a fodder for stock, during periods of drought. Note also specimens of the finely figured wood of SHE OAK (*C. stricta*, Ait.), of Australia. This wood is used for furniture, turnery and wheel spokes, and also makes excellent fuel. The branches are also lopped for fodder in times of drought.

**Birch, Hazel, and Oak Order** (*Cupuliferae*). This large family consists for the most part of trees, many of them of large size, and affords some most valuable timbers, such as oak, beech, &c. Very common in the forests of temperate countries; many species of Oak and Chestnut extend to the Himalaya and Indian islands. The order is divided into three tribes as follows:—

TRIBE I. *Betulae*.—No. 482. BREAD made of BIRCH BARK, from North-west America.

Note wood, bark, and gun-stock made of the wood of **BLACK BIRCH** (*Betula lenta*, L.), of the United States and Canada. The wood is heavy, strong, and close-grained, and is largely used for furniture and cabinet making. **CASE 118.**

The first compartment of this Case contains various ornamental articles made of the bark of the **PAPER BIRCH** (*Betula papyracea*, Ait.), in North America; also specimens of printing on Birch bark. **CASE 119.**

**No. 483.** Butter prints, Tap, and a series of specimens illustrating the manufacture of spools or cotton reels from wood of the **BIRCH** (*Betula alba*, L.). Also Bark of the Birch from Sweden, shoes and basket from Lapland, and Alp horn from Switzerland made of Birch bark. Note also Birch oil, used for imparting the characteristic odour to Russian leather.

**No. 484.** Pedestal made of a beautifully marked sample of **KARELIAN BIRCH** or **MASUR WOOD**, the knotted or gnarled trunk of *Betula alba*, from Finland. Note also boxes, spoons and other articles made in Finland from the wood and bark of this tree.

**No. 485.** Wood and bark of *Betula utilis*, D. Don, a moderate-sized deciduous tree of the higher ranges of the Himalaya. The thin bark is used as paper for writing and packing, also for roofing houses, for umbrellas, and for the tubes of Hookahs. The wood is elastic, seasons well, and does not warp, and is largely used for building purposes.

Note on the lower shelves wood specimens of several species of *Alnus* from America and India.

**No. 486.** Wood, bark, and a series of specimens illustrating the manufacture of clog soles in Ireland from the common **ALDER** (*Alnus glutinosa*, Medic.). Also gun-stock, and young wood as used for making charcoal for the manufacture of gunpowder. **CASE 120.**

**TRIBE II. Coryleae.**—**No. 487.** Wood of **HORNBEAM** (*Carpinus Betulus*, L.) and various articles made from it as lasts for boot makers, shovel handles, bench screw,

**CASE 120.** mallet, &c. The wood is extremely strong, dense, and not liable to split.

In the next compartment are shown **TURKEY NUTS** and **TURKEY FILBERTS**, the fruits of *Corylus Colurna*, L., imported from Smyrna; also fruits and woods of other species of *Corylus*.

**No. 488.** **KENT FILBERTS** and **BARCELONA NUTS**. These are varieties of the common **HAZEL** (*Corylus Avellana*, L.). Filberts and cob nuts are grown largely in Kent, chiefly in the neighbourhood of Maidstone. Barcelona nuts are imported from Tarragona, in the district of Catalonia, Spain. The kernels contain a large quantity of sweet oil, a specimen of which is shown from France.

Observe walking sticks of Hazel, and on the outside of the Case rough and finished Alpenstocks of the same wood.

**TRIBE III. Quercineae.**—Observe a series of galls affecting oak leaves and twigs which have been punctured by minute insects (*Cynips*, *Aphis*, &c.). Some forms of Oak galls are valuable as sources of Gallic and Tannic Acids.

**CASE 121.** In the upper portion of the first compartment of this Case are woods of Italian and Adriatic Oak, furnished by *Quercus Cerris*, L.

Note on the lower shelves specimens of Oak of historical interest, many of them being of great age and proving the durability of Oak timber.

**No. 489.** Block from "Herne the Hunter's Oak," from Windsor Forest.

**No. 490.** Piece of a beam from the Council Chamber of the White Tower in the Tower of London, probably coeval with the building of the Tower by William Rufus.

**No. 491.** Portion of a pile of old London Bridge, in use about 650 years; taken up in 1827.

**No. 492.** A block recovered in 1840 from the wreck of the "Royal George," sunk in 1782 at Spithead.

Note also portion of a pile of old Kew Bridge taken up in 1900. Also another from the foundations of the Arsenal

at Venice, driven in 1312, and well preserved to the present time. CASE  
121.

On the upper shelves of the central compartment observe woods of Dantzic, Memel, Stettin, and French Oaks, furnished by *Q. Robur*. This Oak is known under two forms, described by some writers as distinct species, under the names of *Q. sessiliflora*, Salisb., and *Q. pedunculata*, Ehr.

**No. 493.** Series showing stages in the manufacture of the Oak and Elm fasteners, used to secure rails to the "shoes" and "sleepers" on railways.

**No. 494.** Series of products of destructive distillation of wood obtained from Oak, Beech, Ash, &c. Peeled Oak yields the largest quantity, and the stronger acid, one ton producing 131 gallons of acid and  $5\frac{1}{2}$  cwts. of charcoal.

Observe on the outside of the Case **KYPE** or **WISKET**, a rough kind of basket made of Split Oak Saplings, used in Shropshire for general purposes.

The last compartment contains specimens of **BOG OAK** from Norfolk and Ireland. Also bracelets, brooch, and necklace of Bog Oak.

The first compartment of this Case contains a continuation of specimens of wood of *Q. Robur*, also some illustrations of veneers and of machine carving in Oak. CASE  
122.

On a lower shelf observe model in Cork of the town of Fribourg, Switzerland.

**No. 495.** Wood of **CORK OAK** (*Quercus Suber*, L.) and specimens of bark (Cork) showing the formation of the several layers. The Cork tree grows in Spain, South of France, Italy, and Algeria. Cork is the thick outer bark, which may be removed from the same tree at intervals of 6 to 10 years after it attains an age of about 30 years. The Cork collected previously is of inferior quality. The bark is heated, loaded with weights to flatten it, and then slowly dried. The operation of removing the Cork does not interfere with the healthy growth of the tree; it is said, rather, to favour it. Specimens of various Bottle "Corks," finished and in progress, are exhibited. On the bottom shelf is shown a

**CASE 122.** Cork box called a "Tarro," used in the province of Alentejo, Portugal, by agricultural labourers for carrying their food in and to keep it cool. Observe also a Cork hat, as used in Portugal.

Note in the next compartment a sample of KERMES, the small insects which attach themselves to the leaves and branches of *Quercus coccifera*, L., a native of the Mediterranean region. They furnish a crimson dye and are much used in the South of France, Spain, Morocco, and Turkey, chiefly for dyeing woollens and leather.

**CASE 123.** Specimens of wood and acorns of HOLM or EVERGREEN OAK (*Quercus Ilex*, L.) are shown on the upper shelves of the first compartment. Note also acorns of *Q. Ilex*, L., var. *Ballota*, sold in the markets of Spain and Morocco, and used as food.

Observe also in this Case a collection of woods and acorns of Oaks from India, Malay Archipelago, Japan, China, &c. The following are amongst those exhibited:—*Quercus lamellosa*, Sm., *Q. glauca*, Thb., *Q. fenestrata*, Roxb., and *Q. spicata*, Sm., all East Indian species, *Q. serrata*, Thb., from Japan, and *Q. cornea*, Lour., from China, the last of which is edible.

**No. 496.** GALL-NUTS, or MECCA GALLS, from the puncture of a *Cynips*, on *Q. Lusitanica*, var. *infectoria*, A.DC., a shrubby oak of Asia Minor. Galls produced on other species are also met with in commerce.

**No. 497.** TANNIN, extracted from Gall-nuts. The gelatinous tissue of a piece of raw hide immersed in a solution of tannin gradually combines with it, and retains it in the form of Leather. The colouring matter of ordinary ink is obtained by digesting Gall-nuts with a salt of iron.

**No. 498.** GALLIC ACID, obtained from Gall-nuts.

**No. 499.** VALONIA, the Acorn-cups of *Q. Aegilops*, L. That imported from Greece is furnished by the variety *macrolepis*, and that from Asia Minor by the variety *Ungeri*. It is largely used by tanners and dyers. 25,652 tons of Valonia of the value of £262,819 were imported in 1905.

Observe on a lower shelf section of Oak of Basan (*Q. Aegilops*, L.) CASE 123.

On an upper shelf of the first compartment of this Case observe mounted specimens of Oak-feeding Silkworms, *Antheraea Pernyi*, Guer. Men., of North China, and *A. Yama-Mai*, Guer. Men., of Japan. The former feeds on the "ts'ing-kang-liu" (*Quercus mongolica*, Fisch.), and the "hoo-po-lo" (*Q. dentata*, Thb.); it has been acclimatised in Spain and the United States. CASE 124.

The lower half of the compartment is devoted to woods and acorns of North American species of Oak, including *Q. rubra*, L., *Q. cinerea*, Michx., *Q. alba*, L. The collection is continued in the next division.

The woods shown in this compartment include, amongst others, *Q. Phellos*, L., *Q. nigra*, L., *Q. macrocarpa*, Michx., *Q. virginiana*, Mill., and *Q. aquatica*, Walt.

**No. 500.** QUERCITRON, the bark of *Q. discolor*, Ait., a useful yellow dye. It is also used for tanning, and in medicine as an astringent. Specimens are shown from Baltimore and Philadelphia.

**No. 501.** Wood of the CHESTNUT (*Castanea sativa*, Mill.). A valuable and highly ornamental European tree, attaining, sometimes, an enormous size. Chestnut copeses furnish hoops and vine-props in France. Saplings used for hoops, and the instrument for cutting them, are shown. The wood is very largely used in Corsica for the manufacture of Chestnut Extract, which is used for tanning, and is the staple industry of the island. 12,860 tons of Extract were exported during 1904. Essence of Chestnut is manufactured in Northern France and exported to Belgium for a similar purpose. CASE 125.

**No. 502.** Smoked and dried CHESTNUTS. First and second qualities, as prepared for food at Castigliano, in the mountains of Pistoja. Flour of Chestnuts is also shown, and "Necci" or cakes made from it by mixing it with water, placing the cake on a Chestnut leaf, and baking between heated stones. The Chestnut is an important article of food in the Apennines.

Note also walking sticks formed of Chestnut saplings.

**CASE 125.** The knotted appearance is artificially produced by gashing the plants during growth.

**No. 503.** Wood of the BEECH (*Fagus sylvatica*, L.). A fine forest tree, affording a valuable tenacious and flexible wood. Amongst the articles exhibited made of Beech are sabots, saddle frames, boxes, carpenters' planes, lasts for bootmakers, and a series of specimens illustrating the manufacture of Golf clubs.

On the outside of the Case, is a bullock yoke from France, made of Beech.

**No. 504.** BEECH OIL, obtained in Northern Germany from the fruit of the Beech (Beech-mast), used for food and burning.

**No. 505.** Refuse of Beech-mast, after expressing the oil. Used as fuel.

**No. 506.** Specimens of the wood of the TASMANIAN MYRTLE (*Fagus Cunninghamii*, Hook.), abounding in the forests of Tasmania; often attaining a height of 200 feet, with a girth of 40 feet. The wood is beautifully marked, and is used for cabinet work in the Colony.

**Willow Order** (*Salicineae*). A group of trees, well represented by our Sallows, Osiers, and Poplars. Two genera alone constitute the order, namely, *Salix* and *Populus*.

**CASE 126.** **No. 507.** Wood of WHITE WILLOW (*Salix alba*, L.). It is light and tough, and is used for various purposes. The young wood is made into charcoal, for the manufacture of gunpowder. Specimens of the wood and charcoal are exhibited by Messrs. Curtis and Harvey; also a series of photographs and wood specimens illustrating the manufacture of Cricket Bats, the best of which are generally believed to be made of White Willow.

Near these are samples of SALICINE, the active principle of the Willow. It has been obtained from more than 20 species of *Salix*, as well as from several species of *Populus*, but the barks of *S. alba*, L., *S. Caprea*, L., *S. fragilis*, L., *S. pentandra*, L., and *S. purpurea*, L., are said to yield the largest quantity. Willow barks and



Salicine are used in medicine as a substitute for Cinchona in intermittent fevers, acute rheumatism, &c. CASE  
126.

On the bottom shelf of this compartment note TRUCK BASKETS made of willow wood. Used in gardens, and by the peasantry in Sussex for general purposes.

The middle compartment is devoted to models of BASKETS of various kinds in different stages of construction, made of unpeeled and peeled Willow shoots known as Osiers. These are furnished by *Salix viminalis*, L., *S. purpurea*, L., *S. triandra*, L., and other species. On the upper shelves of the last compartment some very fine specimens of split willow work are shown.

**No. 508.** EXCHEQUER TALLIES (formerly made of Hazel, Alder, or Willow), with an account of the mode of using them. CASE  
127.

In the next compartment of this Case are various illustrations of the uses of willow wood, as sabots, spoons, and strips of wood as used in Russia for making matches and match-boxes. Also paper pulp, paper and a gun-stock made from ASPEN wood (*Populus tremula*, L.). In the last compartment are woods of various species of *Populus*.

This Case contains a series of funeral wreaths and flowers from the tombs of Aahmes I. and Ramses II., Kings of Egypt, of dates respectively 1700 B.C. and 1100-1200 B.C. CASE  
128.

Further specimens are shown on the wall of the descent staircase.

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