

OFFICIAL GUIDE
TO
THE KEW MUSEUMS.

SB60
K4A3
1871

A HANDBOOK
TO THE
MUSEUMS OF ECONOMIC BOTANY
OF THE
ROYAL GARDENS, KEW.

BY
DANIEL OLIVER, F.R.S., F.L.S.,
KEEPER OF THE HERBARIUM OF THE ROYAL GARDENS, AND PROFESSOR
OF BOTANY IN UNIVERSITY COLLEGE, LONDON.

FIFTH EDITION,
With Additions and Corrections,
BY JOHN R. JACKSON, A.L.S., CURATOR OF THE MUSEUMS.



LONDON:
REEVE & CO., HENRIETTA STREET, COVENT GARDEN.
REEVE &
1871.

Price Sixpence.

J. Payne Cooker M.D.
OFFICIAL GUIDE

with Reports of
THE KEW MUSEUMS.

John Bourne

London,

aut 1872

A HANDBOOK

TO THE

MUSEUMS OF ECONOMIC BOTANY

OF THE

ROYAL GARDENS, KEW. *Royal gardens.*

BY

DANIEL OLIVER, F.R.S., F.L.S.,

KEEPER OF THE HERBARIUM OF THE ROYAL GARDENS, AND PROFESSOR
OF BOTANY IN UNIVERSITY COLLEGE, LONDON.

FIFTH EDITION,

With Additions and Corrections,

BY JOHN R. JACKSON, A.L.S., CURATOR OF THE MUSEUMS.



LONDON:

REEVE & CO., HENRIETTA STREET, COVENT GARDEN.

1871.

506 60
A 3
1871

906421850005
24.06

PRINTED BY
TAYLOR AND CO., LITTLE QUEEN STREET,
LINCOLN'S INN FIELDS.



GUIDE

TO THE

MUSEUMS OF ECONOMIC BOTANY.

THE collections occupy three distinct buildings within the Royal Botanic Gardens.

MUSEUM No. I. overlooks the ornamental water, and is directly opposite to the Palm-Stove.

MUSEUM No. II. is three minutes' walk from No. I. Its direction is shown by a finger-post standing by the entrance to the latter.

MUSEUM No. III., devoted chiefly to specimens of Timber and large articles unsuited for exhibition in the cabinets of the other Museums, occupies the building known as the "Orangery," at the north extremity of the Broad Walk, leading to the Ornamental Water and Palm-Stove.

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 some 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 unrivalled collections, not only by far the most extensive in existence, but the first of their kind established, may be briefly traced through the few years which have elapsed since the conception of their plan by the late 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, etc., 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. Application was therefore made to Parliament by the Chief Commissioner, 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.

From the Exhibitions of 1851 and 1862, and from the Paris Exhibitions of 1855 and 1867, large additions were made to the collections, both by the liberal presentation of specimens (by Messrs. P. Lawson and Son, and others), and also by their purchase, aided by grants from the Treasury and Board of Trade.

The important journey to the Eastern Himalaya and Bengal, by Dr. J. D. Hooker, was a further means of largely increasing these valuable stores. Many eminent firms engaged in the importation and manufacture of vegetable substances, have most liberally contributed various illustrative series. By the different Government Departments,—the Admiralty, Board of Trade, etc.,—by our Colonial officers and foreign Representatives, and by numerous private travellers also, the most important services have been rendered and continue to be so.

A large proportion of the contents of the Third Museum, indeed, has been derived from the Exhibition of 1862.

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**. The Orders may be compared to families. They 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 (*Family*) the rule is, that a closer relationship subsists than with the members of another Order. This relationship or affinity is reckoned by the amount of similarity, chiefly in the form and arrangement of the parts of the flower and seed; 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, the 'Mezereon' Order, the 'Linden' and 'Mallow' Orders;—the **BITTER** or **TONIC** properties of the 'Gentian' Order, the 'Quassia' and 'Peruvian Bark' Orders;—the **RESINS** of the 'Amyris' or 'Frankincense' and the 'Pine' Orders;—the **NARCOTIC** or **POISONOUS** character of the 'Nightshade' Order, which includes the Deadly Nightshade, Henbane, and Tobacco; the fruit, too, of the Common Potato, another of its members, is well known to be dangerous.

In dividing the extensive arranged collections between the two museum buildings, advantage has been taken of the two grand classes into which 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, etc., yielded by those plants which are commonly regarded as *not* bearing flowers (as Mosses, Ferns, Seaweeds, Lichens, and Mushrooms), also the miscellaneous articles which do not admit of classification, 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 and popular name of each Natural Order is exhibited *inside*, at the top of the cabinets; also wherever an Order *begins*, if on a lower shelf. The names of the Orders are also referred to in this 'Guide,' the botanical name being in brackets ().

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

The proportion of *numbered objects* is very small to the whole; 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 Curator of the Museums, or to the Director of the Gardens. In the method of arranging, mounting, and labelling the specimens, combining scientific accuracy with much useful popular instruction, most important service has been rendered to the Museums by the late Rev. Professor Henslow.

MAPS are placed in the cabinets, showing in red colour the countries furnishing the products near which they are placed. Each map has a full explanation attached to it.

GUIDE TO MUSEUM No. I.

The chief botanical features which characterize the plants represented by their products or other specimens in this House, 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 forming year by year on the *outside* of, and continuous with, the old, (hence called *Exogens*, outside growers). 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 through the Cases abutting on the back wall of the house to the end of the floor; it then crosses, through the Cases of the end-wall to the front set of Cabinets, through which it continues to the opposite end of the floor, where again it crosses to the back and returns to the head of the stairs. The collections of the Middle and Bottom Floors follow the same order.

TOP FLOOR.

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

No. 1. BIKH or BISH POISON. From the leaves and roots of two or three species of Monkshood (*Aconitum*), growing in the north of India. Used by the hill-tribes to poison arrows for tiger-shooting, etc.

No. 2. ROOTS of MONKSHOOD and HORSE-RADISH, mounted side by side to show the differences between them. The former (*Aconitum Napellus*, L.) is destitute of the pungent odour of the Horse-radish; it is commonly cultivated in gardens, and is a virulent poison.

No. 3. Inner bark of TRAVELLER'S-JOY (*Clematis Vitalba*, L.), used in Switzerland for straining milk and for other domestic purposes. The slender shoots are used in France to bind faggots, and the tender extremities are sometimes pickled.

Observe specimens of wood, etc., belonging to the *Magnolia Order*, remarkable for its fine trees, bearing handsome flowers, natives, mostly, of India and North America.

Custard-Apple Order (*Anonaceæ*). Trees or shrubs, chiefly of tropical countries. The species are aromatic in taste and smell; several afford excellent fruit, as—

No. 4. THE SOUR-SOP (*Anona muricata*, L.).

No. 5. THE SWEET-SOP (*A. squamosa*, L.); and

No. 6. THE CUSTARD-APPLE (*A. reticulata*, L.). All important and largely cultivated tropical fruits.

No. 7. Wood of Duguetia, sp., a South American tree. Said to be one of the **LANCEWOODS** of coach-makers. CASE 2.

The 'Black Lancewood' of Jamaica is furnished by *Oxandra* (*Bocagea*) *virgata*, Rich.

Moon-seed Order (*Menispermaceæ*). Climbing shrubs, possessing bitter and narcotic properties, especially abundant in the tropics.

Observe the curious arrangement of the wood in cross sections of the stem and root.

No. 8. CALUMBA ROOT (*Jateorhiza calumba*, Miers). Imported from Eastern Africa, formerly indirectly through Ceylon, whence the name (from Colombo). A tonic medicine.

No. 9. 'COCCULUS INDICUS' (Fruits of *Anamirta Cocculus*, W. and A.). Native of the East Indies; poisonous; used in taking fish, and the "extract" in adulterating porter.

CASE 2. Barberry Order (*Berberidaceæ*). Shrubs and perennial herbs, inhabiting temperate climates. Many possess acid or astringent properties, as—

No. 10. The preserved fruit of the **COMMON BARBERRY** (*Berberis vulgaris*, L.). Its wood yields a yellow dye.

Observe the *Side-saddle Order* (*Sarraceniaceæ*), chiefly bog-herbs of North America, remarkable from the tubular form of the leaves.

Water-Lily Order (*Nymphaeaceæ*). Large-flowered, floating herbs, growing in quiet water in various parts of the globe.

No. 11. Flower and leaf of the **VICTORIA WATER-LILY** (*Victoria regia*, Ldl.), a native of Guiana and Brazil. The leaves have been observed in deep water to measure twelve feet across; the expanded flowers are about one foot in diameter. The seeds are eaten by the Indians.

Water-Bean Order (*Nelumbiaceæ*). A very small group, consisting of but two or three beautiful species, closely allied to the Water-lilies, but differing in the structure of their fruit and seed.

No. 12. The **LOTUS** (*Nelumbium speciosum*, Willd.). Regarded by the early Egyptians, and by the Chinese, Cingalese, and Hindoos of the present day, as an emblem of peculiar sanctity. Observe the seeds imbedded in the dry, top-shaped fruit. These are believed to have been the "Sacred Beans" of Pythagoras. The seeds and stem, which contain much starch, are used as food in India and China.

CASE 3. Poppy Order (*Papaveraceæ*). Principally herbs, abounding in a milky juice, natives of temperate climates, especially of Europe. They are remarkable for their narcotic properties.

No. 13. Heads of the **OPIMUM POPPY** (*Papaver somniferum*, L.), cultivated from remote antiquity for the sake of its well-known dried juice—*Opium*. Asia Minor, Egypt, Persia, and India, yield the principal supply. The milky juice is obtained by scratching or puncturing 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 punctured 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 carried to the factory in jars (7), where, after sampling by bamboo scoops (8), it is assorted and mixed

with similar qualities in vats, stirred by rakes (9), to ensure uniformity. After sufficient exposure, it is made up into cakes covered by petals of the poppy (14, 15), cemented together 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). CASE 3.

No. 14. Specimens of OPIUM from Smyrna, Egypt, Persia, and India.

Crucifer Order (*Cruciferae*). Nearly all herbaceous; abounding in the temperate countries of the northern hemisphere. They are called *Crucifers* (or 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, though they generally are a little acrid; they are especially anti-scorbutic. CASE 4.

No. 15. MUSTARD SEED (*Sinapis alba*, L., and *S. nigra*, L.). Various sorts of commerce. 'Mustard,' is prepared by crushing the seeds and sifting the 'flour.'

No. 16. 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 leaves. From the seeds of a variety of the Cabbage cultivated on the Continent, the COLZA OIL, used in lamps, is expressed.

No. 17. The so-called "ROSE OF JERICOH" (*Anastatica hierochontica*, L.), growing in the deserts of Arabia and Egypt. The plant is an annual; after withering, its hygrometric stems roll themselves up in a ball, are loosened and blown about by the wind, expanding again with the first rain-fall.

No. 18. WOAD, a dye yielded by *Isatis tinctoria*, L., said to have been used by the ancient Britons, prior to the Roman conquest, to stain their skin a blue colour. From the similarity of the names by which it is known in the languages of Northern Europe, its culture for this purpose has probably been very general at a remote period.

Caper Order (*Capparidaceae*). Herbs or trees, frequently spiny, and chiefly inhabiting hot and desert countries. The fruit is often curiously raised upon a distinct stalk, above the scar of the withered flower. CASE 5.

No. 19. CAPERS. The pickled flower-buds of species of *Capparis* growing by the Mediterranean.

Arnatto Order (*Flacourtiaceae*). Shrubs or trees of the hottest parts of the globe.

Observe the snuff-boxes and ornaments, made of the round fruits of *Oncoba*, by the native tribes about Natal.

CASE No. 20. ARNATTO, used as an orange or yellow dye for silks, and for staining cheese : imported chiefly from South America. It is prepared from the red-coloured pulp which covers the seeds of *Bixa Orellana*, L. Dried specimens of the plant are also here shown, having the red seeds still attached to the inside of the fruit-capsules.

Cistus Order (*Cistaceæ*). A Mediterranean group represented by the 'Rock-roses' and 'Gum Cistus' in our gardens.

No. 21. LABDANUM, a resin exuded by the leaves and branches of *Cistus creticus*, L., and other species of the Levant; formerly, during the prevalence of 'Plague,' largely collected as a medicine, etc., by whipping the plants with long thongs attached to a rake-like frame, the resin adhering to the leathern straps.

Note, in passing, the products of the *Violet Order*, the roots of several species of which possess emetic or purgative qualities, —the *Milkwort Order*, characterized by a bitter principle, —and the *Tamarisk Order*.

Chickweed Order (*Caryophyllaceæ*), to which the Pink, Carnation, and Catchfly belong. Nearly all herbs inhabiting cold and temperate climates. Destitute of marked properties, insipidity rather characterizes the Order.

No. 22. Tufts of *Arenaria musciformis*, Wall., and allied species, brought by Drs. Hooker and Thomson from exposed rocks 14,000 to 18,000 feet above the sea-level, in the Himalaya. Other species grow within the Arctic circle.

CASE No. 6. **Mallow Order** (*Malvaceæ*). A large family, most numerous in the tropics, diminishing in number towards the Poles. Remarkably destitute of all noxious properties; mucilaginous, and affording from the inner layers of the bark a useful fibre. The pink Mallows of our roadsides represent the Order in Britain. Observe specimens of the Ochro, the fruit of *Abelmoschus esculentus*, Med., used in soups, etc., in hot countries.

No. 23. CUBA BAST, the inner bark of *Paritium elatum*, Don, var., used in tying up cigar-bundles. A similar Bast is afforded by a species of *Cavanillesia* in New Carthage (Order *Sterculiaceæ*).

CASE No. 7. No. 24. LAMP OIL, and OIL CAKE for cattle-feeding, from the waste seeds of the cotton-plant.

No. 25. FRUIT of the COTTON-PLANT (*Gossypium herbaceum*, L., *G. barbadense*, L., etc.). Showing 'Cotton' enveloping the seeds in their capsule. Cotton consists of the delicate, tubular, hair-like cells which clothe the seeds; its commercial value depends on the length and tenacity of these hairs.

No. 26. NANKIN COTTON, a naturally coloured variety of CASE the same. 7.

No. 27. A specimen of JAPANESE COTTON, proposed as a substitute for lint.

Case 7 is devoted almost entirely to the different sorts of commercial Cotton, grown in the United States, South America, India, Africa, and the warmer parts of Europe; also specimens of cotton cloths in various stages of manufacture, etc., both by civilized and barbarous nations.

The use of Cotton dates from a very early period. Sanscrit records carry it back at least 2600 years, while in Peruvian sepulchres Cotton cloth and seeds have been found.

No. 28 is a piece of Cotton cloth from a Peruvian mummy.

The import of Raw Cotton into the United Kingdom in 1860 exceeded twelve million cwts.; in 1862, owing to the American War, less than five million cwts. were imported; of these, upwards of three millions and a half were from the British East Indies. In 1870 the total imports increased to 11,931,979 cwts.

[See in Case 17 specimens of *linen cloth* from the Egyptian tombs.]

Sterculia Order (*Sterculiaceæ*). These resemble, in CASE many points of structure, and in their qualities, the Mallow 8. tribe. They are nearly all tropical trees, some of immense size, as the BAOBAB (*Adansonia digitata*, L.), of Western Africa.

No. 29. 'KOLA NUTS,' the seeds of two African trees, one a species of Cola (*C. acuminata*, R. Br.), the other, Bitter Kola, an undetermined Guttifer, highly valued, especially those of the 'Bitter Kola,' by the tribes on the Niger, for their medicinal properties. About 1000 donkeys, laden with the seeds and fruits, pass through Rabba on the Niger, during the dry season, on their way to the interior. The seed of common Kola is said to possess the virtue of rendering water, becoming putrid, agreeable to the taste.

No. 30. Flower of the HAND-PLANT (*Cheirostemon platanoides*, H. B. K.), venerated by the ancient Mexicans from the singular resemblance to a clawed hand presented by the curved stamens of the flower.

No. 31 is a portion of a small stem of the Baobab, together with fine specimens of the gourd-like fruit, which contains an eatable acid pulp. Stems have been measured thirty feet in diameter. The wood is light, soft, and of little utility.

No. 32. DURIAN FRUIT (*Durio zibethinus*, L.), grown in the Malay Peninsula and Islands. By those who have overcome its civet odour, it is ranked among the most delicious of fruits.

CASE No. 33. SILK COTTON surrounding the seeds of *Bombax*

9. *Ceiba*, L., a South American tree. Used for stuffing cushions, and the like, but not suited to work into cloth-fabrics. Another beautiful 'Silk-cotton' (West Indian), from *Ochroma Lagopus* Sw., is exhibited on an adjoining shelf, with a nest of the 'Doctor Humming-bird' made from it.

Chocolate Order (*Byttneriaceæ*). Shrubs or trees resembling the *Sterculias* in many points of structure, and mainly tropical.

No. 34. Fruit of the CHOCOLATE-TREE (*Theobroma Cacao*, L.). Grown chiefly in Trinidad, Guiana, and Brazil. The husk contains a number of the seeds, very closely packed in a little pulp. These, after being dried, roasted, and ground, constitute *Cocoa*; if merely broken up after roasting, *Cocoa nibs*; mixed with starch, and very finely ground, *Soluble Cocoa* of the shops. *Chocolate* consists of the same, made up into a paste, and flavoured. An important collection of specimens of *Cocoa* from various countries, with its different preparations by Messrs. Fry, is here exhibited. In 1870, nearly fifteen millions of pounds of *Cocoa* were imported into Great Britain, more than six millions being entered for home consumption.

Linden Order (*Tiliaceæ*), to which belongs our Lime or Linden tree. As in the case of the last two Orders, without marked properties. The inner bark (*liber*) of some furnishes a very valuable fibre, as—

No. 35. GUNNY FIBRE or JUTE, obtained from *Corchorus capsularis*, L. Used in making rice and sugar bags in India. It is now an article of large and increasing importation.

No. 36. BAST from the COMMON LIME (*Tilia europæa*, L.). 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.

Malay-Camphor Order (*Dipterocarpeæ*). A small tribe of gigantic Indian forest trees, characterized by a curious extension of two of the lobes of the calyx into wings, after flowering, (see mounted specimens,) and by their resinous, balsamic products.

No. 37. Log of SUMATRA CAMPHOR TREE (*Dryobalanops Camphora*, Col.). The crystallized Camphor is shown *in situ*, upon the wood. It sometimes occurs in masses several pounds in weight. It does not reach Europe, being eagerly bought by the Chinese, in preference to ordinary camphor, their own produce.

Tea Order (*Ternströmiaceæ*). The species, which are all

woody, are chiefly South American and Indian. The most important member of the family, the Tea-plant (*Thea chinensis*, L.), is native in Bengal, and probably China, though in the latter country, so famed for its production, it is only known under cultivation. There are three varieties of the shrub, from any of which either 'black' or 'green' teas may be prepared, by peculiar methods of drying; 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. CASE 9.

No. 38. A box of ingredients used in the artificial colouring of lower kinds of green tea.

No. 39. BRICK TEA of Tibet, pressed and dried in moulds. It is largely used in Central Asia, boiled with salt, butter, etc. Observe the 'wheatsheaf,' 'lozenge,' 'yellow,' and other sorts of tea.

Upwards of 117,000,000 pounds of tea were entered for home consumption in 1870, the total import exceeding 140,000,000 lbs.

Upon the adjoining wall are hung Chinese drawings, upon rice-paper, representing 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.

Orange Order (*Aurantiaceæ*). Trees or shrubby plants, most of them bearing smooth and shining leaves, often jointed to the stalk, and minutely dotted with translucent oil-glands. Natives of South-eastern Asia, China, Japan, and the East Indian Islands.

No. 40. BAEL OR BELA, of India (*Egle Marmelos*, Cor.). A delicious fruit. The unripe fruit and bark are used medicinally, as astringents.

No. 41. Preserved fruits of the **WAMPEE**, of China and the East Indies (*Cookia punctata*, Retz).

Observe the fruits of different varieties of Orange, Lime, Shaddock or Pompelmousse, Forbidden Fruit, etc., 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 very extensively in warm countries. CASE 10.

No. 42. ORANGES (*Citrus Aurantium*, Riss.) ripened in the open air in Devonshire.

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, as many as 1,933,421 bushels were imported into the United Kingdom in 1870.

No. 43. FINGERED CITRON, a variety of *Citrus medica*, Riss., having the fruit curiously divided into large finger-like lobes.

CASE Oils of **NEROLI** and **BERGAMOT**, highly esteemed as perfumes,
 10. are distilled from the flowers and rind of the fruit of species of *Citrus*.

Tutsan Order, or "St. John's-worts" (*Hypericaceae*). Plants with opposite, undivided leaves, often dotted with minute oil-glands, easily seen when held against the light. They are scattered widely over the globe, although not very numerous, either in species or individuals. A few are used in medicine.

Gamboge Order (*Guttiferae*). A group of trees and shrubs, with entire, opposite, smooth, and rather thick leaves, all natives of tropical countries. Many of the Order afford a yellow, purgative, resinous juice, which in some East Indian species is collected as Gamboge, the well-known valuable pigment and medicine.

No. 44. Bark and young wood of the **CEYLON GAMBUGE** tree (*Garcinia Morella*, Desv.; *Cambogia*, L.; *Hebradendron*, Grah.); showing the coloured juice which has exuded and dried upon the cut edge. In Ceylon, Gamboge is obtained by incisions in the bark, or by cutting out pieces of it; the juice, oozing from the wounds, hardens on exposure, and is scraped off by collectors.

No. 45. Samples of **SIAM GAMBUGE**, the produce of a variety of the above *G. Morella*, *β. pedicellata*.

No. 46. The **MANGOSTEEN** (*Garcinia Mangostana*, L.). Specimens ripened at Sion House, the seat of the Duke of Northumberland. Said to be the most delicious of tropical fruits. It is a native of Malacca and the East Indies.

No. 47. Fruit of the **BUTTER and TALLOW TREE** (*Pentadesma butyracea*, Br.), of Sierra Leone. So named from the yellow greasy juice which copiously flows from it when cut. It is mixed by the Negroes with their food.

No. 48. The **MAMMEE APPLE** (*Mammea americana*, L.), from the West Indies; and

No. 49. *Mammea africana*, Sab. From Sierra Leone and the Niger. Delicious tropical fruits. The gum of the American *Mammea* is used to destroy the 'chiggers' (*Culex penetrans*) in the feet of the Negroes.

CASE No. 50. **HOG-GUM**, a resin abundantly afforded by *Morone-*
 11. *jaea coccinea*, Aubl., a fine tree of Jamaica. Chiefly collected by Negroes, who dig it from among the roots of old gum-trees. It is used in medicine, and is inflammable, burning with an agreeable odour.

[The False Hog-gum of Jamaica is yielded by *Rhus Metopium*, L., (*Anacardiaceae*).]

Coca Order (*Erythroxylaceæ*). Chiefly West Indian and South American trees or shrubs, some remarkable for the red colour of the wood, hence the name of the Order. 11.

No. 51. A bundle of the dried leaves of the *Coca* (*Erythroxylon Coca*, Lam.), the narcotic of the Andes and Peru. The Coca-bush is extensively cultivated by the Indians; the annual produce having been estimated at 30,000,000 pounds. 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 increased nervous energy.

Observe the 'popona,' or lime-flask of the Indian coca-chewer, also 'Ipadú,' the powdered leaf, mixed with a little tapioca, the ashes of Quinoa, *Cecropia*, etc.

['Coca' must be distinguished from 'Cocoa' of the shops, the produce of *Theobroma Cacao*, see Case 9.]

Observe the curious structure of the wood in the stem of one or two of the *Malpighia Order* (*Malpighiaceæ*), a family chiefly tropical South American; often with long twining or pendent stems (*lianes*), bearing opposite leaves, and gaudy flowers with clawed petals.

No. 52. CROSS SECTION of the STEM of an unknown species of *Malpighiaceæ*.

Soapwort Order (*Sapindaceæ*). Chiefly tropical trees and climbers. The fruits of several are edible; others possess a saponaceous principle, and lather freely in water.

No. 53. Fruit of the *AKEE* (*Blighia sapida*, Kg.). A tree of Western Africa. The edible portion is the *aril*, the succulent socket developed round the base of each seed.

No. 54. *GUARANA BREAD* of Brazil, made from the seeds of *Paullinia sorbilis*, Mt. Sold all over Brazil, and used both as food and medicine. For use the rolls are powdered in water, or grated on the 'Piraruca,' the tongue of a fish (see specimen), and sweetened.

No. 55. WOOD of the *HORSE-CHESTNUT* (*Æsculus Hippocastanum*, L.). An Asiatic 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, etc.

No. 56. *LITCHIS* (*Nephelium Litchi*, Don); and

No. 57. *LONGANS* (*N. Longanum*, Hk.). Fruits of China and the East Indian Islands, imported in small quantities, dried for dessert.

- CASE No. 58. SOAP-BERRIES, the seeds of *Sapindus Saponaria*, L.,
11. made up into rosaries; formerly worn in England, tipped with gold, etc., as buttons. The seed-vessels are employed in America and the West Indies in washing linen, of which they are said to cleanse more than would sixty times their weight of soap.

No. 59. TULIP-WOOD of Australia (*Harpulia pendula*, Planch.)

- CASE **Maple Order** (*Aceraceæ*). Trees principally of temperate
12. Europe, Asia, and America, having opposite and mostly lobed leaves, with the veins radiating from the leaf-stalk. The Sycamore (*Acer Pseudoplatanus*, L.), extensively planted in Britain, is an example of the family.

No. 60. MAPLE SUGAR from the United States and Canada. Obtained from the Sugar Maple (*Acer saccharinum*, L.), the sweet sap of which is collected in 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, drained, and crystallized. Good Sugar Maples yield each about an average of four pounds of sugar in the season.

The wood of this species sometimes exhibits beautiful 'curled' and spotted markings (Bird's-Eye Maple); such is much valued for inlaying and cabinet-work.

- CASE No. 61. Wood of the Maple (*Acer campestre*, L.) and Sycamore
13. (*A. Pseudoplatanus*, L.). The white soft wood of the Sycamore was much used before the general introduction of earthenware for making trenchers, bowls, platters, etc.

Under *Rhizopholaceæ*, a small Order of huge South American forest trees, note—

No. 62. SOUARI NUTS, the fruit of *Caryocar nuciferum*, L., *C. tomentosum*, Willd., etc. The kernel is said to be the most delicious of the nut kind. It contains an excellent sweet oil, used in South America. The timber of *C. tomentosum* is valuable for ship-building.

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

No. 3. CARAPA OF CRAB OIL, obtained from the seeds of *Carapa guineensis*, Juss., and used by the natives of Western Africa for burning and also for anointing their bodies. Imported into the South of France for soap-making.

- CASE No. 64. SATIN WOOD, afforded by an East Indian tree (*Chloroxylon Swietenia*, L.).
14. The wood is durable, close-grained, and will take an excellent polish, preserving a handsome appearance for a long time.

No. 65. Dye-Wood of *Flindersia Oxleyana*, Muell. A South

Australian tree; with specimens of wool dyed with it, in various shades of yellow-brown. CASE

No. 66. GUM of the WEST INDIAN CEDAR (*Cedrela odorata*, L.); and 14.

No. 67. WOOD of the same.

No. 68. CEDAR-WOOD of NEW SOUTH WALES (*Cedrela australis*, Br.)

[Although called 'Cedar,' these are totally distinct from the true Cedar (*Cedrus Libani*, Loud.), which belongs to the Pine Order, Case 97.]

No. 69. Model of a truck, laden with Mahogany, as employed in bringing the logs to the coast, from the interior of Honduras.

No. 70. MAHOGANY, the wood of *Swietenia Mahagoni*, L. A large forest-tree of Central America and Cuba. One of the most valuable of furniture woods. It is stated upon good authority that a single log lies 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 has been there about fifteen years, and is likely to remain till it rots. Upwards of 32,000 tons were imported in 1870.

Vine Order (*Ampelidæ*), 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. None of the Order are native in Europe; they are chiefly East Indian. The Grape-vine, now cultivated so extensively in France, Germany, South Europe, Atlantic Islands, United States, Cape, etc., 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 Valentia, 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, Liparis, etc. These are quite distinct from any species of *Ribes*, the Currant of our orchards, to which they are not botanically related. CASE 15.

The products of the grape are mostly unsuited for museum exhibition.

Upwards of 15,000,000 gallons of wine were entered for home consumption in 1870; nearly 10,000,000 gallons of which were imported from Spain and Portugal.

CASE Of raisins, 337,230 cwts., and of currants, 776,381 cwts., were entered for home consumption in the same year.

15.

No. 71. CREAM OF TARTAR (Bitartrate of Potash), deposited in a crude state, upon the bottom and sides of casks containing fermenting wine. 57,898 cwt. were imported in 1870.

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

Observe the anomalous structure of the stem in

No. 72. *Monsonia Burmanni*, DC. That of *M. spinosa* burns like a torch, with a pleasant odour.

Indian Cress Order (*Tropæoleæ*). Smooth trailing or twining herbs, with a pungent taste. The garden Nasturtium (*Tropæolum majus*, L.) and Canary-flower (*T. peregrinum*, Willd.) are familiar examples.

No. 73. Parasol Cover, made of the FIBRE of the GARDEN NASTURTIUM. [*Nasturtium* (Water-cress) belongs to the Crucifer Order.]

Wood-Sorrel Order (*Oxalideæ*). A small family of herbaceous (though sometimes arborescent) plants, frequently with compound leaves, which are sometimes sensitive, abounding in a powerful acidity, due to the presence of oxalic acid. Natives of tropical and temperate countries, chiefly South America or South Africa.

No. 74. THE BLIMBING (*Averrhoa Bilimbi*, L.), an acid fruit used in the East Indies, often pickled. Notice also the Carambola (*A. Carambola*, L.), likewise eaten in the East Indies.

No. 75. OXALIC ACID, prepared from the Wood-sorrel (*Oxalis Acetosella*, L.).

Flax Order (*Linaceæ*). A small family of plants, chiefly annual, with showy, fugitive flowers, characterized by the tenacious fibre of the inner bark. The most important species is the common Flax (*Linum usitatissimum*, L.), specimens and products of which fill this Case, also Cases 16 and 17.

No. 76. LINSEED, the seeds of the Flax-plant. The husk, or *testa*, of the seed, abounds in mucilage, set free in water. Largely used for the expression of 'Linseed Oil,' the refuse seeds being crushed into

No. 77. OIL-CAKE, for cattle-feeding.

The samples of Linseed are from Russia, Sicily, Egypt, East Indies, and America.

No. 78. British, Dutch, Russian, and other varieties of FLAX, as harvested.

NO. 79. 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. CASE 16.

NO. 80. 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 remaining extraneous matter. The wire pins are arranged on different frames, in progressive degrees of fineness. The process is now performed by special machinery.

NO. 81. FLAX, as imported, of Russian and other growths.

NO. 82. Flaxen tarpaulin, for railway use.

NO. 83. Linen cloth used to envelope the dead by the ancient Egyptians, among whom Flax was cultivated from remote antiquity. It was grown also by the Jews, who obtained it from Egypt. CASE 17.

The remainder of this case contains numerous specimens of linen cloths, etc., chiefly of Irish manufacture.

In 1870, 2,373,528 cwts. of Flax and Tow, or Codilla of Flax, were imported into the United Kingdom, upwards of one million being from Russia. Of Linseed, 1,490,695 quarters were imported in the same year.

Pittosporad Order (*Pittosporaceæ*). A small group of woody species, without very salient botanical features, confined to the Old World. They are chiefly Australian and Polynesian.

NO. 84. Wood of *Pittosporum bicolor*, Hk., and *P. undulatum*, Vent., from Victoria and New South Wales. White, adapted for turners' purposes, and recommended as a substitute for the Box-wood used by engravers.

Guaiacum Order (*Zygophyllaceæ*): Bearing opposite and usually compound leaves. The abundance, especially of spinous species, is characteristic of desert vegetation in Egypt and Western Asia. Some of them are fine trees, as that affording CASE 18.

NO. 85. LIGNUM VITÆ (*Guaiacum officinale*, L.). Native of the West Indies, growing very slowly, and attaining a great size. The wood is remarkable for the singular brownish-green of the heart-wood, and its extreme hardness and toughness, which adapt it for pestles, mortars, rulers, etc. It contains a green resin used in medicine, which is obtained either from incisions in the trunk, or by heating the wood broken up into fragments.

Rue Order (*Rutaceæ*). Chiefly trees or shrubs, widely scattered over the warmer temperate regions of the globe; numerous in Australia, the Cape of Good Hope, and tropical America. The Order is characterized by the prevalence of a bitter, odorous,

CASE essential oil; the leaves being usually dotted with minute resinous gland-spots. The leaves and bark of several species are employed in medicine as febrifuges, antispasmodics, etc.

No. 86. Leaves and Oil of common RUE (*Ruta graveolens*, L.). A plant much esteemed in ancient and rustic medicine.

No. 87. BUCHU leaves, from species of *Barosma* (*B. crenulata*, Willd., etc.). Growing at the Cape of Good Hope. A stimulant tonic.

Zanthoxylum Order (*Zanthoxylaceæ*). Woody plants, growing in tropical countries, allied to the Rue Order, and, like them, with pellucidly dotted and, usually, divided leaves. The species possess agreeably aromatic properties.

CASE No. 88. JAPAN PEPPER (*Zanthoxylum (Fagara) piperitum*, 19. 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.

No. 89. Stem of *Zanthoxylum Clava-Herculis*, L., of the West Indies, with walking-sticks made from it. Observe the curiously tubercled bark.

Quassia Order (*Simarubaceæ*). 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. 90. Seeds of the CEDRON (*Simaba Cedron*, Pl.), which in Central America are regarded by the native tribes as an antidote for the bites of venomous reptiles, scorpions, etc. Their virtues are probably much exaggerated.

No. 91. BITTER-WOOD: *Picroena excelsa*, Ldl., in the West Indies; *Quassia amara*, L., in Surinam: the former of these being one of the sorts employed to make the 'litter cups' recently so extensively sold, and which, from the powerful bitter of the wood, communicate a taste to water left in them. Quassia chips are used medicinally as a tonic, etc.

CASE **Spindle-tree Order** (*Celastraceæ*). A family of woody 20. plants, mostly extratropical, 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 europæus*, 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) in which the seeds are nestled. The young shoots formerly furnished skewers to the butchers.

Buckthorn Order (*Rhamnaceæ*). An extensive group of trees and shrubs, often armed with spines, and characterized by the structure of the flowers, which are usually small, and have

the stamens opposite to the separate, minute petals. Found CASE nearly all over the globe, excepting the extreme north. Two 20. species grow in Britain.

Observe the stem curiously flattened in alternating, triangular joints, of

No. 92. *Colletia cruciata*, G. and Hk. A Chilian Shrub.

No. 93. PERSIAN or YELLOW-BERRIES, the fruit of *Rhamnus infectorius*, L., used by the modern Greeks to dye Morocco leather; employed also in calico-printing.

No. 94. SAP-GREEN, a well-known pigment, obtained from the ripe berries of the common Buckthorn (*R. catharticus*, L.) and other species by the action of lime, etc.

No. 95. JUJUBE (*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.

No. 96. LOTE FRUIT (*Z. Lotus*, Lam.) of North Africa, said to be the Lotos of the ancient Lotophagi. (See 'Nelumbium Order,' Case 2.)

No. 97. CHAW-STICK. Portions of the stem of *Gouania domingensis*, L., from the West Indies, used to clean the teeth.

Cashew-nut Order (*Anacardiaceæ*). Chiefly large tropical CASE trees, often with a resinous or caustic juice; several species bear 21. very valuable fruit. They occur both in the Old and New Continents; some extend into temperate countries, a few reaching the South of Europe. The flowers are usually very small.

No. 98. MARKING NUTS, the fruit of an East Indian tree, *Semecarpus Anacardium*, L. f. The 'nut,' which contains a black, corrosive juice, rests upon a thickened stalk (peduncle), eaten by the natives. The resinous juice of the nut is employed in marking cotton cloths, being improved for the purpose by the addition of lime and water; it was formerly used in medicine.

No. 99. THE MANGO (*Mangifera indica*, L.), cultivated very generally in hot countries, though especially common, in a multitude of varieties, in India and the East Indian islands, where it is probably native. The Mango is esteemed a most delicious fruit; unripe it is used in tarts, preserves, etc.

No. 100. PISTACIA-NUTS. Fruit of *Pistacia vera*, L. A small tree of Western Asia and the Levant; now spread far along the shores of the Mediterranean. The kernels are pleasant to the taste, eaten raw or cook with salt and pepper.

Observe the wood of *Pistacia terebinthus*, L.: one specimen presented by the Prince Jerome Bonaparte.

No. 101. MASTIC. A resin obtained in the Greek Archipelago, chiefly in Scio, from incisions made in the bark of *Pistacia Lentiscus*, L. It is used as a varnish, and by dentists.

CASE No. 102. CASHEW-NUT. Fruit of *Anacardium occidentale*, L.,
21. a tree of Brazil, Central America, and the West Indies. The edible portion is the swollen pear-shaped stalk (peduncle), which supports the nut. The kernel also is eatable when roasted.

CASE No. 103. SUMAC. The broken and powdered leaves and twigs
22. of *Rhus Cotinus*, L., and *R. Coriaria*, L. Shrub of South Europe and the Levant. Extensively employed in tanning light-coloured leathers, and also as an orange-yellow dye. 14,431 tons were imported in 1870.

No. 104. JAPAN WAX. Afforded by the small fruits of *Rhus succedanea*?, L. Employed in candle-making.

Observe the numerous specimens of gums and resins afforded by the Order. Many of these are not yet satisfactorily identified with the trees respectively producing them. The specimens of wood of several species are worthy of note.

The **Amyris** or **Myrrh Order** (*Amyridaceæ*). 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.

Observe especially

No. 105. BDELLIUM, a resin, probably afforded by a species of *Balsamodendron*.

No. 106. MYRRH, afforded by shrubs of the Red Sea, Abyssinia, etc., species of *Balsamodendron*. Its use dates from high antiquity, being mentioned in the book of Exodus. Specimens in flower of Myrrh-producing plants are much wanted.

No. 107. BALM OF GILEAD or MECCA, obtained from incisions through the bark of *Balsamodendron gileadense*, Kth., a small shrub of Western Asia. It is now said to be extinct in Judæa and Egypt, where it formerly grew. The present small supply is obtained from Arabia.

Observe also

No. 108. GUM OLIBANUM, the product of certain species of *Boswellia*, growing in the South of Arabia and on the Somali coast. It is used in incense, on account of the aromatic vapour given off when burning.

[Further light is much needed upon 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 very valuable.]

Leguminous or **Peaflower Order** (*Leguminosæ*). The specimens and products illustrating this great Order, extend from Case 22 to Case 31. The species number about six to seven thousand. They are either herbs, shrubs, or trees, and are widely

distributed over the surface of the globe. One section 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, etc.), and large numbers are cultivated, both as important food plants (Peas, etc.), and for ornament (Acacias, Laburnum, Lupin, etc.). This large Order is subdivided into three principal groups. The true Peaflowers or

Papilionaceæ : containing most of the esculent plants ;
Cæsalpinieæ : furnishing Senna, Logwood, Tamarinds, etc. ; and
Mimoseæ : Gum Arabic, Catechu, etc.

§ *Papilionaceæ*.

No. 109. SUNN HEMP of India (*Crotalaria juncea*, L.), extensively cultivated for the sake of its fibre, especially in Mysore and the Deccan. Large quantities are now imported into England. By proper treatment it becomes soft, fine, and white, bearing comparison with flax. CASE 23.

No. 110. BASKETS and MATS made of the twigs of the YELLOW BROOM (*Genista scoparia*, Lam.).

No. 111. Samples of RED and WHITE CLOVER-SEED (*Trifolium pratense*, L., and *T. repens*, L.). Upwards of 155,000 cwts. were imported in 1870. Frequently adulterated with old and dead, or kiln-dried seed, and with the cheaper Hop-clover (*T. procumbens*, L.), etc.

No. 112. INDIGO. Samples from the East and West Indies. Obtained principally from two or three species of *Indigofera* (*I. Anil*, L., *I. tinctoria*, L., etc.), by soaking the plant in large masses, in tanks. After its removal, the water is stirred and beaten by 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 up into cakes. Of this valuable dye-stuff, 79,255 cwts. were imported in 1870.

No. 113. TRAGACANTH, a viscid gum, yielded by several species of *Astragalus* growing in Asia Minor. [Specimens of Tragacanth-yielding species, with information on the mode of collecting the gum, are much wanted.]

No. 114. LIQUORICE ROOT (*Glycyrrhiza glabra*, L., and *G. echinata*, L.), cultivated chiefly in Spain and Italy, and to some extent, in the South of England and Yorkshire. 'Spanish Juice' is the sweet extract evaporated to dryness. Made up with gum, gelatine, etc., it forms 'Pipe-juice' and other confections.

CASE No. 115. Models of varieties of the cultivated PEA (*Pisum sativum*, L.), probably native originally of countries bordering the Black Sea.

No. 116. LENTILS, seeds of *Ervum Lens*, L. Cultivated also by the Hebrews and ancient nations. The flour is often sold under the name of 'Ervalenta' or 'Revalenta.'

No. 117. GRAM. Seeds of *Cicer arietinum*, L. An annual herb, cultivated from an early period in warm countries, especially in India, where it is used in cakes, curries, etc. It was known to the ancient Egyptians, Hebrews, and Greeks. The plant is said to abound in Oxalic Acid.

CASE No. 118. GROUND NUTS. Pods and seeds of *Arachis hypogaea*, L. 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. Its native country is doubtful; M. A. de Candolle thinks it of American origin.

No. 119. WEST INDIAN EBONY. Furnished by *Brya Ebenus*?, A. DC., a small tree of Jamaica. It takes a beautiful polish, and is used for making walking-sticks, inlaying, etc.

No. 120. SHOLA (and SINGAPORE HAT of the same), the wood of *Eschynomene aspera*, L. A marsh plant, growing in the lakes and jheels of India. It is a bad conductor of heat. Often worked into models of temples, flowers, etc. Note also a model of a Hindoo temple made of the same.

CASE No. 121. Seed of MUCUNA, drifted across the Atlantic by the Gulf Stream from the West Indian Islands to the Azores and Norwegian coast, where they are occasionally picked up.

No. 122. ORDEAL BEANS of Old Calabar, West Africa. The seeds of *Physostigma venenatum*, Balf., a most remarkable poison.

No. 123. CRABS'-EYES, seeds of *Abrus precatorius*, L., used in India by jewellers and druggists as weights, being nearly uniformly each one grain. They are strung together for necklaces, rosaries, etc.

No. 124. A series showing the variety in structure of the fruit obtaining in the group of *Dalbergia*, arranged by George Benthams, Esq.

No. 125. ROSEWOOD. Specimens from Brazil and Central America. The best Brazilian Rosewoods, exported from Rio, are afforded by species of *Dalbergia*. [We are very ignorant of the trees furnishing the different 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.]

CASE No. 126. TONQUIN BEANS (*Dipteryx odorata*, Willd.), from 27. Guiana. They are very fragrant, and are used to scent snuff.

NO. 127. RED SANDERS WOOD (*Pterocarpus santalinus*, CASE L. f.) affording a reddish-brown dye, used for woollen cloths. 27.

NO. 128. AFRICAN ROSEWOOD (*Pterocarpus erinaceus*, Poir.), with fruit-bearing twig, from the Gambia. The source of this wood was unknown previous to the receipt of these authentic specimens. *P. erinaceus* affords the African resin Kino.

NO. 129. BALSAM OF PERU, yielded by *Myrospermum Pereira*, Royle. A tree of (not Peru, but) Central America. The Balsam exudes from incisions made in the bark. [The source of the 'Balsam of Tolu' (see adjoining specimens) is imperfectly known. Specimens are requested of the flower and fruit of the tree affording it.]

§ *Cæsalpinicæ.*

NO. 130. LOGWOOD. The heart-wood of *Hæmatoxylon Campechianum*, L., a large tree of Central America (Honduras, Campeachy, etc.) and the West Indies, 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. 62,287 tons were imported in 1870.

NO. 131. Seeds of *Guilandina Bonduc*, L., a common shrub on tropical shores. They are sometimes washed up by the Atlantic current on the Irish coast; they are stated to have germinated after the voyage.

NO. 132. DIVI-DIVI PODS (fruit of *Cæsalpinia Coriaria*, Willd.). A powerful astringent, imported from South America, for the use of tanners.

NO. 133. SAPPAN WOOD (*Cæsalpinia Sappan*, L.). A red dye-wood, imported from India and Ceylon. CASE 28.

NO. 134. SENNA. The leaves of several species of *Cassia* (*C. obovata*, Coll., *C. acutifolia*, Del., *C. lanceolata*, Forsk., etc.), imported from India, Egypt, and North Africa. Well known as an important purgative medicine.

NO. 135. JURUPARIS, 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 folds of the bark of *Parivoa grandiflora*, Aubl. (See Case No. 50, Museum No. II.)

NO. 136. TAMARINDS. The pulp of the pods of *Tamarindus indica*, L., imported from India and the West Indian Islands, preserved in sugar or syrup. Observe the tables and chairs near Case 25 made of the Tamarind Wood.

NO. 137. COPAL, various commercial varieties of. The pro-

CASE 28. duce of West African trees. [Respecting the true sources of this valuable varnish-resin we still need information. Specimens of the flower and fruit of Copal-trees are requested. Indian Copal, or *Piney varnish*, is a product of *Vateria indica*, L. 'Dipterocarp Order,' Case 9.]

NO. 138. WOOD of WEST INDIAN LOCUST-TREE (*Hymenæa Courbaril*, L.), tough and close-grained, valuable for trenails and timber of steam-engines. Some of the Brazilian Locust-trees, according to Von Martius, attain a size so great that fifteen Indians with outstretched arms could just embrace one of them.

NO. 139. Stems of species of *Bauhinia*, showing a remarkable mode of growth, being flattened and corrugated in the middle; they are termed 'Land-turtles' Ladders.'

NO. 140. Balsam of *Copaiba* imported from Brazil, and produced by species of *Copaifera*. [Specimens of the Balsam-producing species with the balsam of each are much needed.]

Observe specimens of the seeds of a species of *Mora* from Central America, probably containing the largest Dicotyledonous Embryo.

NO. 141. CAM-WOOD, furnished by a West African tree. (*Baphia nitida*, Lodd.); the red dye of Bandana handkerchiefs.

NO. 142. CAROB-PODS, the fruit of *Ceratonia Siliqua*, L., a tree of South Europe, the Levant, etc. The legumes contain a sweet pulp, and are now extensively imported for cattle-food. The seed of this tree is the original of the carat of jewellers.

§ *Mimoseæ*.

NO. 143. Legumes of *Entada scandens*, Bth., a climbing Indian shrub. Some of the specimens measure about four feet in length by four to five inches in breadth. The seeds (NO. 144), about two inches across, are made into little boxes, etc.

Observe the curious pod of *Tetrapleura Thonningii*, Bth., from West Africa, remarkable for the strong ridge down the back of each valve.

CASE 29. [Observe also the specimens of very valuable Australian timbers, known under the names of Australian 'Sallow,' 'Wattles,' 'Wild Tamarind,' etc., afforded by species of *Acacia*, some of them of great beauty. Specimens of flower and fruit with sections of the wood are especially requested.]

CASE 30. NO. 145. GUM ARABIC. The produce of various species of *Acacia* (*A. vera*, Willd., *A. arabica*, Willd., *A. Verek*, G. and P., etc.), exuded spontaneously or from incisions in the bark; formerly brought from Arabia, or at least Egypt; the supply at the present time being principally from Senegal, West Africa.

No. 146. CATECHU, prepared by boiling the heart-wood and CASE
 pods of *Acacia Catechu*, Willd., an East Indian tree. It con- 30.
 tains much tannin, and is extensively imported from India for
 the use of tanners. The word *Catechu* signifies tree-juice. The
 names of 'Cutch,' and 'Terra-japonica,' have also been given to
 this substance, but these are distinguished in commerce. 'Terra-
 japonica' being (it is stated) obtained from *Uncaria Gambir*, Roxb.
 [See also Case 46, 'Gambir.']

No. 147. NIOPÉ SNUFF, made from the pods of *Acacia*
Niopo, H. B., by the Indian tribes of the Rio Negro, South
 America, with the instruments used in its preparation.

In this case are numerous miscellaneous fibres, woods, etc., CASE
 believed to be furnished by members of the Leguminous Order, 31.
 the species being undetermined.

Rose Order. (*Rosaceæ*). A numerous family of plants, CASE
 either trees, shrubs, or herbs, abounding principally in cool and 32.
 temperate climates, and including many species of great impor-
 tance. The Apple, Cherry, Rose, and Strawberry may be taken
 as familiar types of the group.

The Order is divided into sections or tribes—

§ ROSEÆ. *Rose* and *Bramble* as type.

§ DRUPACEÆ *Almond*, *Peach*, and *Cherry*.

§ POMACEÆ *Apple*, *Hawthorn*.

§ SANGUISORBEÆ. Small group of herbs and undershrubs.
 The *Ladies' Mantle*.

§ CHRYSOBALANEÆ. Tropical trees and shrubs, some bear-
 ing eatable stone-fruit.

§ *Rosææ*.

No. 148. Koussou, the flowers of *Brayera anthelmintica*, Kth.,
 an Abyssinian tree; a celebrated vermifuge.

No. 149. QUILLAI BARK (*Quillaja saponaria*, Mol.) used in
 Chili and Brazil instead of soap to remove grease from cloth, etc.

No. 150. ROSE BEDEGUARS: "Robin Redbreast's pincush-
 ions." Mossy excrescences often found on the common Dog-
 rose (*Rosa canina*) in hedges; they are occasioned by the puncture
 of insects, chiefly *Cynips Rosæ*, and *Ichneumonidæ*. Observe the
 Bedeguars cut across, showing the cavities containing the larvæ.

No. 151. ATTAR or OTTO OF ROSES, obtained from the petals
 (flower-leaves) of sweet-scented species of Rose (*Rosa moschata*,
 Ait., *R. centifolia*, L., *R. damascena*, L.). The 'Otto' of the
 London market is chiefly produced in Turkey; some is also ob-
 tained in the South of France, Tunis, and Persia, as well as at Gha-
 zepore, in India. The Turkish Otto is almost invariably adulterated
 with the oil of an Indian *Andropogon* (Case 33, Mus. No. II.).

§ *Drupacea.*

CASE Observe the wood of various species of *Prunus*, including the
32. Cherry (*P. Cerasus*, L.), Garden and Portugal Laurel (*P. Lauro-Cerasus*, L., and *P. lusitanica*, L.): these latter do not belong to the true Laurel Order (Cases 70-72.)

CASE No. 152. ALMONDS.—JORDAN, VALENCIA, and BITTER,—
33. the kernel of the fruit of different varieties of *Amygdalus communis*, L., a Mediterranean tree, extending into Persia, cultivated in the North of Africa, Italy, Spain, etc. Jordan and Valencia Almonds are imported from Malaga and other Spanish ports. Bitter Almonds chiefly from Barbary, Sicily, etc.

No. 153. OIL and ESSENTIAL OIL (Essence) of Almonds. Observe also Almond-cake, remaining after the expression of the oil. With the addition of water, this cake yields, on distillation, the Essential Oil of Almonds, the residue being used to feed cattle. Several species of this section of the Rose Order contain a considerable amount of Prussic (Hydrocyanic) Acid; the oil of the common Laurel and Bitter Almond is, owing to its presence, a virulent poison.

§ *Pomacea.*

CASE No. 154. Wood of the HAWTHORN (*Crataegus Oxyacantha*,
34,35. L.), and its variety the *Glastonbury Thorn*.

No. 155. REFUSE 'TRASH,' left in cider and perry making, used in Switzerland as fuel for stoves.

No. 156. Wood of the Apple- and Pear-trees (*Pyrus Malus*, L., and *Pyrus communis*, L.), and of the Mountain Ash, Rowan or Rodden tree (*Pyrus Aucuparia*, Gært.); the last useful as a nurse-tree in plantations, enduring severe exposure. Formerly regarded with superstitious veneration as a charm against witchcraft, etc.

No. 157. The QUINCE (*Cydonia vulgaris*, Pers.). The fruit is eaten stewed, in tarts and confectionery, or made into marmalade. It grows wild in the South of Europe.

No. 158. The LOQUAT, a dessert fruit afforded by *Mespilus (Eriobotrya) japonica*, Thb. A native of China and Japan.

No. 159. The MEDLAR (*Mespilus germanica*, L.). Common in many parts of Europe, and occurring in English hedgerows.

§ *Chrysobalanæ.*

No. 160. The Bark of the CARAÍPI, or POTTERY-TREE of Pará (*Moguilea utilis*, Hk. f.). The powdered bark, baked with equal quantity of clay, makes vessels for domestic use, capable of withstanding a great amount of heat.

No. 161. Vessels for heating milk, etc., made as above stated. **CASE**
Loosestrife Order (*Lythraceæ*). Principally herbs with 35.
 entire, opposite leaves, widely dispersed over the globe, some of
 the tropical species being shrubs or trees.

The common *Purple Loosestrife* of wet ditches, represents the
 Order in Britain.

No. 162. HENNA, the powdered leaves of *Lawsonia inermis*,
 L., made up into a paste, and used by the Egyptian ladies to dye
 their nails, by way of ornament, an orange-colour. The colour
 lasts from three to four weeks without renewal.

Mangrove Order (*Rhizophoraceæ*). Opposite-leaved trees, **CASE**
 growing up on the muddy shores of tropical countries. Chiefly 36.
 remarkable from the seeds germinating in the fruit, forming a
 long root before dropping into the ground, which they sometimes
 reach before becoming detached.

No. 163. Germinating seeds of the MANGROVE, *Rhizophora*
Mangle, L.

No. 164. MANGROVE BARK; from its astringency, used in
 tanning.

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

No. 165. MYROBALANS, the fruits of Indian species of *Ter-*
minalia, are imported for the use of tanners. Some of the Indian
Terminalias afford valuable timber.

Passing the 'Melastom' Order—a very large tropical family,
 characterized by opposite three-veined leaves, and splendid flowers
 with curious stamens, but affording very few economic products—
 and the small 'Alangium' Order, the head of the stairs is again
 reached.

MIDDLE FLOOR.

The collection is continued in the same order through the Cases
 of this Floor, commencing immediately to the left, round the
 corner on reaching the head of the first flight of stairs from the
 Ground Floor.

Myrtle Order (*Myrtaceæ*). A very large Order, num- **CASE**
 bering about 1300 species, trees or shrubs; abounding in hot 37.
 countries, especially South America, the East Indies, and Aus-
 tralia. The most northern member is the common Myrtle (*Myr-*
tus 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

CASE marked by a vein running round the margin, just within the edge
37. of the leaf. None of the Order have blue flowers. Observe the numerous specimens of Australian woods furnished by the genera *Melaleuca* (Australian Tea-trees, etc.) and *Eucalyptus* (the Gum, Iron-bark, and Stringy-bark). Some of the Gum and Stringy-bark trees rise to an enormous height, having straight, unbranched trunks, from 100 to 150 feet in height. Note also the variety in structure of the bark.

No. 166. Bark, annually shed, of *Melaleuca leucadendron*, L. used for thatching.

No. 167. Specimens of Gum, from various species of *Eucalyptus*; some undetermined. Note a series of fruits of Eucalypti.

No. 168. WOOD OF BLUE GUM (*Eucalyptus globulus*, Lab.), of Tasmania and South-east Australia.

CASE No. 169. Bark of a *Eucalyptus*, on which rude drawings have
38. been sketched by the Aborigines of Victoria.

[Specimens of the timber of Australian 'Gum,' 'Stringy,' and 'Iron-bark' trees, with *flowering branches* from the same trees, would be highly valued; they are required to remove the uncertainty at present felt as to the precise source of these valuable woods.]

No. 170. POMEGRANATES, the produce of *Punica Granatum*, L., cultivated from early antiquity for its valuable fruit; believed to have been originally a native of Western Asia, from the Mediterranean to Persia and the interior, and not of Carthage, as its name would denote (*Malum punicum*). It was known to the Hebrews under the name *Rimmon*, and is mentioned in Deuteronomy as a product of Palestine; the root is an excellent vermifuge. The bark has been used in dyeing, and it is this which gives the colour to yellow morocco leather.

CASE No. 171. GUAVAS. Two varieties—the Apple or red, and
39. Pear-shaped or white—afforded by *Psidium pomiferum*, L., and *Psidium pyriferum*, L., commonly cultivated as dessert-fruits in tropical countries. M. A. de Candolle considers the Guava of Central American or Mexican origin.

No. 172. CLOVE PEPPER, called also ALLSPICE, PIMENTO, and JAMAICA PEPPER, the dried unripe fruits of *Pimenta vulgaris*, Ldl. (*Myrtus Pimenta*, L.), a tree carefully cultivated in Jamaica: 21,282 cwts. were imported in 1870.

No. 173. CLOVES. The dried, unopened flower-buds of *Caryophyllus aromaticus*, L., originally brought from the Moluccas; now cultivated for this valuable spice in Eastern Africa, West Indies, etc. The oil of Cloves is prepared from Cloves by distillation. Observe the curious and fragrant ornamental models from Amboyna made of Cloves strung together.

No. 174. ROSE APPLES, the fruit of the *Jambosa vulgaris*, DC., CASE
an Indian or Malayan tree. 39.

No. 175. Wood of species of *Acmena*, Australian trees not
thoroughly determined.

Monkey-pot Order (*Lecythideæ*). Large trees, with CASE
scattered, undotted leaves, closely allied in structure to the Myrtles. 40.
The fruit of the Monkey-pots is very remarkable, consisting of
a hard, round, or lengthened capsule, containing the seeds, and
opening transversely by a lid at the top. They grow in the
forests of the hottest parts of South America.

No. 176. SAPUCAIA NUTS, the edible seeds of *Lecythis Zabucajo*, Aubl., *L. Ollaria*, L., gigantic forest-trees of Brazil and
Guiana.

No. 177. BRAZIL-NUTS, about twenty-one of which are con-
tained in one of the hard-shelled fruits of the *Bertholletia ex-
celsa*, H.B., an enormous tree, growing on the Amazons.

No. 178. Fruit of the CANNON-BALL tree (*Couroupita gua-
nensis*, Aubl.), from St. Vincent's. Some of the most curiously-
formed fruits of this Order belong to species not yet determined.

Passing the small tropical 'Barringtonia' Order, also allied to
the Myrtles.

Mare's-tail Order (*Haloragææ*). A group of shrubs and
herbs, growing in marshy places, bearing small, and often very
reduced, flowers.

No. 179. WATER CHESTNUTS, the horned fruits of *Trapa
bicornis*, L., *T. bispinosa*, Rxb., and *T. natans*, L., growing in
ponds, lakes, etc., in temperate Europe and Asia. In China and
also Kashmir the fruits of the Water Chestnut are important
articles of food, and are collected in large quantities.

The Evening Primrose Order (*Onagrææ*). Herba- CASE
ceous plants or shrubs, mostly of temperate countries; some 41.
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.

The Gourd Order (*Cucurbitacææ*). A group of prostrate
or climbing plants, with palmately-lobbed leaves and tendrils,—
chiefly tropical, with but few species extending into cool regions.
Cucumbers (*Cucumis sativus*, L.) and Melons (*C. Melo*, L.)
belong to the Order. Many of the species are acrid and pur-
gative.

No. 180. TOWEL GOURDS (*Luffa ægyptiaca*, DC.) grown
in the West Indies and West Africa. The close vascular network
of the inside of this gourd serves as scrubbing-brush, sponge,

CASE and to strain Palm-wine. It is also worked up into light ornamental articles, baskets, etc. Observe the variety in form of the fruit of various species of gourd here exhibited, especially the snake and viper gourds (*Trichosanthes anguina*, L., and *T. colubrina*, Jq.).

CASE 42. Specimens of Poterion, Custard, Portmanteau, etc., gourds (*Cucurbita maxima*, Duch., and allied species), forms chiefly due to long-continued cultivation and selection of a stock probably originally wild in Southern Asia. The Greeks and Romans were acquainted with several varieties of gourd.

CASE 43. Case 43 contains also a large collection of tropical Gourds and Calabashes, some of remarkable size and shape; they are principally the shells of the fruits of *Lagenaria vulgaris*, Ser., and *Cucurbita maxima*, Duch. They are employed for an innumerable variety of purposes,—as domestic utensils, drums, musical instruments, snuff-boxes, etc. The outer surface is often elaborately carved.

[The name *Calabash* is also applied to the shell of the fruit of *Crescentia*. See Case 61.—In Museum No. II., a huge Gourd is suspended from the ceiling in the large room.]

No. 181. The PAPAW, fruit of *Carica Papaya*, L. (*Papaya vulgaris*, DC.) Though now scattered widely through tropical countries in both hemispheres, believed to have originally spread from the warm parts of the American continent. The fruit is edible. The Papaw possesses the remarkable property of rendering meat newly killed tender in a few hours by being suspended among its leaves, causing a separation of the muscular fibres.

Observe the small *Pangium* Order, Indian trees allied to the Papaws, and the *Purslane* Order, succulent plants often bearing gay flowers, including

No. 182. PURSLANE (*Portulaca oleracea*, L.). A potherb and salad, occurring in sterile places over an immense area in both hemispheres: it is a valuable antiscorbutic. Observe also the *Napoleona* Order, a small West-African group of trees bearing flowers of remarkable structure; and the

Fig-Marigold Order (*Ficoideæ*). A tribe of succulent plants, remarkably characteristic of the hot desert plains of the Cape of Good Hope; their flowers are often very beautiful. From their succulent nature, specimens serviceable for purposes of botanical comparison are necessarily preserved in fluid. A large collection of species of *Mesembryanthemum*, flowering in the Royal Gardens is here exhibited, continued also in Case 44.

CASE 44. **Indian Fig Order** (*Cactaceæ*). 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 naturalized in Southern Europe. CASE 44.

No. 183. Fibrous portions of the stem of *Opuntia*, made up into various ornamental articles.

No. 184. COCHINEAL. Small hemipterous insects subsisting upon an Indian fig (*Opuntia*), to which the wingless females attach themselves. Cultivated in Mexico, Brazil, and the Canary Islands, for the sake of their rich crimson dye. 36,672 cwts. of Cochineal were imported in 1870.

No. 185. Portions of the OLD MAN CACTUS (*Cereus senilis*, Salm), so called from the hoary aspect of the columnar stems. One species in Western North America (*C. giganteus*, Engl.) attains a height of 45-50 feet.

No. 186. *Oxalate of Lime* deposited in immense quantities in the tissues of some Cactuses (*Cereus* spp.).

Note, in Cases 44 and 45, the small Orders of *Gooseberry* and *Currant*, shrubs of temperate climates with acid edible fruits; of *Saxifrages*, herbs of northern and mountainous countries; and of *Witch-Hazels*, a small group of trees and shrubs, widely dispersed over the globe. Two or three species of one section of the latter Order afford balsamic resins, as

No. 187. LIQUID STORAX, obtained by boiling the bark of *Liquidambar orientale*, Mill., a tree of Asia Minor. CASE 45.

Umbellifer Order (*Umbelliferae*), so called from the arrangement of the flower-stalks in heads or 'umbels.' There are about 1500 species, all herbaceous, and abounding in temperate climates. The products of the group vary much in character. Some are acrid and virulently 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.

No. 188. Umbels of *Ammi Visnaga*, Lam., brought from Africa and the Levant to Marseilles. The "rays" are used as tooth-picks.

No. 189. ASAFETIDA, a gum-resin obtained from the thick roots of *Narthez asafetida*, Falc., *Scorodosma fetidum*, Bge., and allied species growing in Tibet and Central Asia.

No. 190. GUM AMMONIACUM, obtained from *Dorema ammoniacum*, Don, in Persia and Armenia. Specimens of the plants are upon a lower shelf.

No. 191. GUM GALBANUM, afforded by *Ferula galbaniflua*, Buh., a plant of Persia; principally imported from Bombay. {Specimens in fruit of any Umbellifer from Central Asia, yielding

CASE gum-resin, with a sample of the product, collected by an eyewitness, would be greatly valued.]

45. No. 192. HEMLOCK LEAVES and SEEDS (*Conium maculatum*, L.). A powerful narcotic, used in medicine. The juice, probably mixed with Opium, was given by the Athenians to citizens condemned to death, as in the case of Socrates and Phocion. It is common in waste places; the stem is often marked with small brown blotches.

No. 193. 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, etc.

No. 194. GUM SAGAPENUM, a rare drug, believed to be the produce of an Umbellifer of Western Asia. Perhaps *Ferula persica*, Willd., or *F. Szowitsiana*, Dec.

No. 195. BALSAM BOG (*Bolax glebaria*, Com.), a singular feature in the landscape of the Falkland Islands, forming huge, hard, and perfectly hemispherical hillocks, often two to four feet in height. It yields a gum which has been used in medicine. [A "hillock" of the plant is exhibited in a glass case in the passage of Museum No. II.]

No. 196. SUMBUL, or MUSK-ROOT (*Euryangium Sumbul*, Kauf.), from Central Asia.

Observe the seeds of various aromatic species, Caraways (*Carum Carui*, L.), Cumin (*Cuminum Cyminum*, L.), Fennel (*Foeniculum vulgare*, Geert.), Corianders (*Coriandrum sativum*, L.), etc.

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

No. 197. VIRGINIAN SARSAPARILLA, the climbing stem of *Aralia nudicaulis*, L. Used medicinally in the United States.

No. 198. RICE PAPER. A valuable and instructive series, illustrating the preparation of the 'paper' from the pith of *Aralia papyrifera*, Hk., a tree of Formosa; with 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 3 inches, being sold by the Chinese for 1¼d. or 1½d.), dyed rice-paper, artificial flowers, etc.

[Flower-paintings on rice-paper, by Chinese artists, are suspended on the ends of cases No. 43 to 47.]

No. 199. ROPE made of fibre from the Common Ivy (*Hedera Helix*, L.).

No. 200. GINSENG, the root of *Panax Schinseng*, Nees.

Native in North China or Mandschuria. So highly valued as a **CASE** restorative medicine in China, that it is sold at from 20 to 250 **45.** times its weight in silver, sometimes for 500 times this amount. It possesses no important medicinal properties.

Observe the **HONEYSUCKLE ORDER**, represented in Britain by the Woodbine and Elder—the flowers and berries of the latter are useful in household economy; and the **CORNELL ORDER**, to which the Dogwood of shrubberies belongs.

Mistletoe Order (*Loranthaceæ*). 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.).

No. 201. Sections showing the close 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. See specimens in this Case.

Peruvian Bark Order (*Rubiaceæ*). A very large Order, **CASE** numbering about 2800 to 3000 species; common in tropical countries. **46.** Characterized by opposite undivided leaves, having scales (*stipules*) between the bases of the stalks. A small section (*Stellata*), differing in having their leaves in rings or whorls of from four to eight, represents the Order in cool countries. Several species afford most important economic products.

No. 202. QUININE. The most important tonic and febrifuge, obtained from the bark of various species of difficult determination, belonging chiefly to the genus *Cinchona*, a group of trees growing upon the slopes of the Andes, in Peru and Bolivia. From the scarcity of accessible trees affording good bark, and its consequent high price, the British Government have very successfully introduced plants into the cooler districts of India, where the annual consumption of Quinine is enormous. The Dutch Government have also established some species in the island of Java.

Various named varieties of *Cinchona* and *Cascarilla* barks are exhibited in this Case; also an etching of a scene in a *Cinchona* forest, from Dr. Weddell.

No. 203. IPECACUANHA. The root of *Cephaelis Ipecacuanha*, Rich., and allied species; Brazilian shrubs. The roots afford the important emetic medicine.

CASE No. 204. GAMBIR, called also 'TERRA JAPONICA,' an astringent extract, prepared by boiling down the leaves and shoots of *Uncaria Gambir*, Rxb., a climbing, hooked shrub, growing in the Malay peninsula and islands, used by tanners and dyers. 19,050 tons of 'Terra japonica' were imported in 1870.

No. 205. NEGRO PEACH, of Sierra Leone. The dense fruit-heads of *Sarcocephalus esculentus*, Afz.

CASE No. 206. COFFEE, the seeds of *Coffea arabica*, L. A tree, native in Abyssinia and tropical Africa, now widely cultivated in hot countries. Ceylon, Java, the West Indies, Brazil, and Central America, afford the principal supply of this important product. From Ceylon alone, upwards of ninety-seven millions of pounds were imported in 1870. The fruit of the Coffee-tree, which resembles a cherry in size and colour, contains two seeds (beans), which are separated by mechanical contrivance from the pulp; after washing, to remove the adhering mucilage, and exposure sufficient to 'cure' the seeds, they pass through a rolling-mill, which removes the parchment-like husk immediately enclosing the seeds. The commercial value depends on the size, form, and colour of the beans, and their flavour. Specimens of the different Coffees of the London market are here exhibited. The total importation of Coffee in 1870 amounted to 179,841,747 pounds, upwards of 30,000,000 being entered for home consumption.

No. 207. MADDER, the root of *Rubia tinctoria*, L., cultivated expressly for the sake of its valuable red dye, in France, Southern Europe, and the Levant.

No. 208. INDIAN MADDER, or MUNJEET, from an allied species (*Rubia cordifolia*, L.), another important red dye imported from Northern India. Of Madder and Garancine (the latter prepared from Madder by the action of sulphuric acid), upwards of 215,000 cwts. were imported in 1870.

CASE No. 209. VALERIAN ORDER (*Valerianaceæ*). Herbs of temperate climates often aromatic or strong-scented.

No. 209. SPIKENARD, the root of *Nardostachys Jatamansi*, DC., a plant of Northern India, highly valued in India from a remote period as a perfume. Observe also the

Teazle Order (*Dipsacæ*). 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. 210. The FULLER'S TEAZLE (*Dipsacus fullonum*, Mill.). 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 in different sizes and qualities, known as 'King's,' 'Queen's,' 'Seconds' and 'Buttons.' Every piece of fine broadcloth requires from 1500 to 2000 teazles to bring out the proper nap, after which they are useless. CASE 48.

Composite Order (*Compositæ*). 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.

No. 211. EPIDERMIS of the leaves of *Andromachia igniaria*, H.B., from Quito, used as tinder.

No. 212. JERUSALEM ARTICOKES, the tubers of a Sun-flower (*Helianthus tuberosus*, L.), originally introduced from some part (now unknown) of the American continent. CASE 49.

No. 213. 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, etc.

No. 214. CHAMOMILES, the flowers of *Anthemis nobilis*, L., and common Wild Chamomiles (*Matricaria Chamomilla*, L.), well-known stimulating tonics.

Observe, on the lower shelf of this compartment, flowers, whole and pulverized, of *Pyrethrum roseum*, Bieb., a very efficient insect destroyer.

No. 215. Scleroleima forsteroides, Hk. fil., forms dense green cushions on the summits of the Tasmanian mountains.

No. 216. CHAPLET, or 'IMMORTELLE,' made of the flowers of an 'Everlasting' (*Helichrysum* sp.), commonly hung about tombs on the Continent. CASE 50.

No. 217. Raoulia eximia, Hk. fil., grows in large tufts on the mountains of New Zealand, where it is called the "Sheep plant," from its resemblance, even at a short distance, to that animal.

No. 218. CAFFER TEA, the leaves of *Helichrysum nudifolium*, Less. Rather common in the Cape Colony; used medicinally.

No. 219. CHICORY, the root of *Cichorium Intybus*, L., cultivated in England, Germany, and other parts of Europe, for the purpose of mixing with coffee, which it is considered by some to improve. The roots are sliced, kiln-dried, roasted, and ground.

CASE No. 220. DANDELION-ROOT (*Taraxacum Dens-leonis*, Desf.),
50. now a troublesome weed almost wherever cultivation extends. A common rustic medicine. Observe crystallized *mannite* from the Dandelion.

No. 221. DOGWOOD of Tasmania (*Bedfordia salicina*, DC.).

CASE No. 222. MUSKWOOD of Tasmania and New South Wales
51. (*Eurybia argophylla*, Cass.). Close-grained and taking a good polish, it is useful in cabinet-work.

Observe the **Storax Order**, a small group of woody plants affording the fragrant resins Benzoin and true Storax.

No. 223. STORAX, a gum-resin obtained from wounds in the stem of *Styrax officinale*, L., a small tree of Asia Minor and Syria. This fragrant resin, which was known to the ancients, is now lost to commerce.—Why is this? (Liquid Storax: see Case 45.)

No. 224. GUM BENZOIN, derived from *Styrax Benzoin*, Dry. A native of the Malay islands.

Heath Order (*Ericaceæ*) and its near ally, the CRANBERRY ORDER (*Vacciniaceæ*). All woody plants, 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, two or three species of numerous individuals cover very large areas, as the common Ling or Heather (*Calluna vulgaris*, Sal.).

Observe stem of the TREE HEATH (*Erica arborea*, L.), from Teneriffe.

CASE No. 225. *Rhododendron nivale*, Hk. fil. Believed to attain
52. the loftiest elevation of any Alpine shrub known; brought by Dr. Hooker from 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. Observe sections of the wood of *Rhododendron* (*R. arboreum*, Sm.).

No. 226. A YAK SADDLE, used in the Himalaya, made of the wood of *Rhododendron Hodgsoni*, Hk. fil.

Epacris Order (*Epacridaceæ*). A group corresponding very closely to the Heath Order in general appearance and structure, and representing that family in Australia. A few afford excellent berries. Observe—

No. 227. Specimens of *Richea pandanifolia*, Hk. fil., growing in Tasmanian forests, and presenting a peculiarly striking appearance from the huge crowns of waving leaves surmounting a slender naked stem, often 36 feet in height.

Ebony Order (*Ebenaceæ*), consisting principally of tropical Indian trees, several of which afford a heavy and valuable wood. Continued in Case 53.

No. 228. EBONY. The best sort is obtained from *Diospyros Ebenum*, Retz, a native of Ceylon; other Indian species yield however a very similar wood. Ebony, characterized by its extremely dark colour and hardness, is (as specimens here exhibited show) the 'heart-wood' (*duramen*) of the tree; the 'sap-wood' (*alburnum*) is white and not durable. The Greeks and Romans were acquainted with Ebony; it is mentioned by Dioscorides, Pliny, etc. CASE 53.

No. 229. CALAMANDER WOOD, afforded by another Ceylon *Diospyros* (*D. quæsita*, Thw.), a most beautiful cabinet wood taking a high polish; it is so hard that edge tools can scarcely work it.

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

No. 230. 'YERBA DE MATÉ,' or PARAGUAY TEA, the leaves of *Ilex paraguayensis*, St. Hil., and allied species (according to Mr. Miers): in the province of Paraguay and Brazil cultivated to a great extent. The leaves are scorched and dried, while still attached to the branches brought in by the collectors; they are then beaten, separated, coarsely ground by rude mills, and packed in skins and leathern bags. The leaves are infused in small teapots, of which several forms are here shown, and the tea imbibed either from the spout or by

No. 231, a 'BOMBILLA,' or tube with wire network or perforations at the bottom. The consumption of Maté in South America is enormous; upwards of five millions of pounds, it is said, are annually exported from Paraguay alone. [In Museum No. II., Case 82, are exhibited two packages of Paraguay Tea, too large for this cabinet, one made of the skin of the 'great ant-eater.']

No. 232. 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, etc. 'Bird-lime' is the juice of Holly-bark, extracted by boiling, mixed with a third part of nut-oil.

Sapodilla Order (*Sapotaceæ*). Mainly trees and shrubs of tropical countries; frequently abounding in a milky juice. Several species afford excellent fruits. CASE 54.

No. 233. BALATA. The inspissated juice of *Mimusops Balata*, Gærtn. Introduced from British Guinea as a substitute for Gutta-Percha.

No. 234. SHEA BUTTER, from the seeds of *Bassia Parkii*, Don, growing in Western Africa: likely to become a valuable import for the manufacture of candles and soap.

CASE No. 235. Fruit and seeds of *Bassia Parkii*, Don. Note also sections of the wood upon a lower shelf.

CASE No. 236. Vegetable BUTTER, expressed from the kernels of the seeds of *Bassia butyracea*, Rxb., a tree of Northern India. It is said to make excellent soap, and to burn without smoke or smell.

Observe portion of the Stem of the 'MASSARANDUBA,' or COW-TREE' of Pará; the milk, resembling good cream in consistence, exudes slowly from the wounded bark. It is too viscid to be a safe article of diet. [This species is not determined. Specimens in flower are requested.]

No. 237. STAR APPLE, fruit of *Chrysophyllum Cainito*, L., growing in the West Indian Islands and South America.

No. 238. Branches, with fruit, of *Argania Sideroxyylon*, R.S., a shrub growing in Marocco. The pulp of the fruit is eaten by cattle; from the kernels *Argan Oil*, resembling Olive Oil, is expressed.

No. 239. Specimen of ARGAN OIL.

CASE Case 56, devoted to specimens of GUTTA-PERCHA.

56. No. 240. Dried specimens of *Isonandra Gutta*, Hk., the inspissated juice of which constitutes the Gutta-Percha imported from Singapore and the Malay Islands.

Specimens of crude Gutta-Percha are exhibited, from Singapore and Borneo, with a great variety of articles, applied to all sorts of purposes, manufactured from it. 33,514 cwts. of Gutta-Percha were imported in 1870.

[Allied species of *Sapotaceæ* grow in the East Indian Islands, Madagascar, and Guiana, affording a milky juice similar to Gutta-Percha. Specimens of such, in flower, with their respective products, are requested.]

CASE Note a few specimens of the wood of members of the MYRSINE

57. ORDER, growing especially in warm, equable climates, agreeing closely in structure with the Primrose and Cowslip, excepting in their woody stems: also samples of oil, yielded by the fragrant JASMINE ORDER, are contained in this cabinet.

Olive Order (*Oleaceæ*). A family characterized by opposite leaves, and flowers with two stamens, natives of temperate latitudes; represented by the Ash in Britain.

No. 241. INSECT WAX, from China, secreted by *Coccus Pe-la*, Westw., upon the branches of *Fraxinus chinensis*, Rxb., and probably other trees.

No. 242. MANNA, the concrete, sweet juice of two species of Ash (*Fraxinus rotundifolia*, Ait., and *F. Ornus*, L.), growing in Sicily and Southern Italy. It is obtained from incisions in the bark, made in summer and autumn.

Note specimens of the wood of the Common Ash (*Fraxinus excelsior*, L.), the toughest and most elastic British timber, greatly valued by the cart- and wheel-wright, cooper, machine-framework and agricultural implement makers. In request in olden time for spears. CASE 57.

No. 243. Branches of the Olive-tree (*Olea europaea*, L.), the emblems of peace and plenty. A tree of Syria and Greece, naturalized abundantly on the shores of the Mediterranean, the South of France, and Spain. Valued from a remote period for the sake of the oil obtained by pressure from the pulp of its fruit. It is frequently mentioned in the Sacred Writings. CASE 58.

No. 244. ROSARIES made of the wood and seeds of the Olive from Jerusalem.

No. 245. Samples of OLIVE OIL, imported from Italy, Spain, France, Turkey, the Ionian Islands, etc. 23,202 tuns were imported in 1870. Castile soap is made of olive oil and soda; soft soap, the oil with potash.

Observe under the MUSTARD-TREE ORDER, a very small tribe of doubtful affinity,—

No. 246. Sections of *Salvadora persica*, L., supposed by Dr. Royle to be the 'Mustard-tree' mentioned in the New Testament. Considerable doubt attends the determination. *Salvadora* grows from Syria eastward to India, and even down to Ceylon.

Asclepias Order (*Asclepiadaceæ*), represented in hot-houses by the fleshy-leaved *Hoyas* and other beautiful species. The *Asclepiads* are especially tropical, many of them African and Indian twining shrubs, frequently with a milky juice. The structure of the flowers is very anomalous.

No. 247. YERCUM FIBRE, obtained from *Calotropis gigantea*, Br., common in waste places in India. The plant affords also important native medicines employed in cutaneous affections, etc. Remark specimens of the seeds of *Asclepiads*, showing the beautiful crest of silky hairs which usually surmounts them. CASE 59.

No. 248. INDIAN SARSAPARILLA, the root of *Hemidesmus indicus*, Br., used medicinally in India.

Dogbane Order (*Apocynaceæ*). In many respects similar to the *Asclepiads*, and, like them, often with a milky, sometimes very poisonous juice, as in the *Tanghin* (*Tanghinia venenifera*, Poir.). Formerly used in Madagascar as an ordeal in cases of suspected crime or apostasy. The Periwinkle (*Vinca*) of our gardens belongs to the Order.

No. 249. Caoutchouc, from *Urceola elastica*, Rxb., a tree of the East Indian islands, also E. African rubber from a species of *Landolphia*.

No. 250. Edible fruit of *Landolphia florida?*, sent from West African by Dr. Baikie's Expedition.

CASE 60. No. 251. DODO CLOTH, made from the fibre of the '*Kpok-poka*' tree, of West Africa. [Specimens in flower of this tree are required for its accurate determination.]

No. 252. 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.

Strychnos Order (*Loganiaceæ*). Chiefly tropical, bearing opposite, undivided leaves. The Order is eminently poisonous, affording some of the most dangerous drugs known to us.

No. 253. Fruit and seeds of NUX-VOMICA (*Strychnos Nuxvomica*, L.).

No. 254. STRYCHNIA, a powerfully poisonous alkaloid prepared from the seeds of the same species.

No. 255. 'WOURALI' or 'CURARE' of Guiana, prepared from the bark of *Strychnos toxifera*, Schomb., another virulent poison, used by the Indians to tip weapons for war and the chase.

Gentian Order (*Gentianeæ*). A numerous and widely-dispersed family of herbaceous plants, generally with smooth, entire, opposite leaves, and beautifully coloured flowers. They are characterized by a powerful bitterness in every part: hence their use by all nations as febrifugal and stomachic medicines.

No. 256. GENTIAN ROOT (*Gentiana lutea*, L.). Grown in France, Germany, the Alps, Pyrenees, etc.; principally employed as a tonic medicine.

Note also the leaves of British species of the Order, used in rural medicine,—Bogbean (*Menyanthes trifoliata*, L.), and Field Gentian (*Gentiana campestris*, L.).

[Opposite to Case 60 stands a small cabinet, made of Australian woods, containing a named collection of materials used by tanners—astringents, dyes, etc. Most of these are referred to under the Orders to which they respectively belong. Passing to Case 61, at the end of the floor, observe, near the door of the Curator's Office, a second cabinet of Australian construction (chiefly made of the Huon Pine: see Case 93), containing a collection of sections of the stems of undetermined species, showing anomalous modes of growth; also a series illustrating the construction of 'Tunbridge ware,' Scotch snuff-boxes, and 'checked ware,' (chiefly made of Sycamore wood,) the construction of violins, etc., as well as a valuable series of materials, fruits, etc., from the ancient Pile dwellings in the Swiss lakes.

Numerous coloured drawings of Rhododendrons, from Dr. Hooker's 'Rhododendrons of Sikkim-Himalaya,' are suspended upon the adjoining walls.]

Under the small tribe of *SESAMUMS* (*Pedaliaceae*), observe— **CASE**
 No. 257. Seeds of *Sesamum indicum*, DC., an annual, cultivated in warm countries, India, China, Africa, and America, for the sake of the valuable oil expressed from the seed. It is 'the Oil' of India, where it is universally used in cooking, anointing, for soaps, etc. In England used chiefly in soap-making, and to burn in lamps. 61.

No. 258. Oil of *SESAMUM*, or *GINGELEY OIL*.

No. 259. Remarkably armed fruit of *Martynia proboscidea*, Glox., and

No. 260. Yet more strange fruit of the *GRAPPLE PLANT* (*Harpagophytum procumbens*, DC.), from the Cape of Good Hope.

Trumpet-flower Order (*Bignoniaceae*), characterized by twining or climbing stems, often bearing divided leaves and magnificent flowers. They are mainly intertropical.

No. 261. The pod-like fruit of an Indian species of *Bignonia*.

No. 262. Red Pigment, prepared from the leaves of the *CHICA* (*Bignonia Chica*, Hb.). Used by the Indians of South America in the adornment of their persons.

Note the beautiful membrane-like wing, often of curious microscopic structure, surrounding the seeds of several species of the Order.

Under the closely allied tropical group, the '*CALABASH ORDER*,' observe numerous *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. 263. A carved *CALABASH CUP* of the ancient Incas, dug up at Cusco, in the Peruvian Andes, by the Governor of Pasco, in 1843.

No. 264. Woody fruits of species of *Kigelia*, from the Mauritius Abyssinia, etc.

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. 265. *SCAMMONY*, a gum-resin obtained from the roots of *Convolvulus Scammonia*, L., growing in Asia Minor and Syria. Employed as a purgative medicine.

No. 266. '*SWEET POTATO*.' The root of *Batatas edulis*, Chy. Commonly and very extensively cultivated in tropical countries, although not known to have been collected in the wild state. It is believed by M. A. de Candolle to be of American origin. The root contains much starch and saccharine matter.

CASE No. 267. JALAP, the root of *Exogonium Purga*, Bth., a well-known medicine, named from Xalapa, a city of Mexico, near to which the plant grows.

Observe the BORAGE ORDER (*Boraginaceæ*). Rough-leaved plants, with one-sided flower-spikes; growing in temperate countries, especially around the Mediterranean. The roots of some species afford dyes, as—

No. 268. ALKANET-ROOT (*Alkanna tinctoria*, L.), from the shores of the Mediterranean. It yields a red dye, used to stain furniture, etc. Some of the *Cordias*, allied to the Borage Order, afford a tolerable fibre.

CASE Under the DODDER ORDER (*Cuscutaceæ*), a tribe of the
62. Bindweeds, observe mounted specimens of *Dodder* (*Cuscuta Epithymum*, L., *C. Trifolii*, Bab., *C. Epilinum*, Weihe, etc.), leafless twining parasites, with small clustered flowers, growing upon and destroying common clover, flax, etc. Three species grow in Britain.

Nightshade Order (*Solanaceæ*). A large and widely distributed group of herbs and shrubs, most abundant between the tropics, characterized by dangerous and narcotic properties. Familiar representatives are the Potato, Tomato, and Tobacco.

No. 269. TOMATOES, the fruit of *Lycopersicum esculentum*, Mill. A plant probably of Mexican or South American origin; commonly cultivated as an esculent.

No. 270. CAPSICUMS, the acrid and biting fruit of *Capsicum annuum*, L., and allies, cultivated in India, Africa, and warm parts of America, Spain, etc. Cayenne pepper, the well-known pungent condiment, is the ground seeds of one or more species of *Capsicum*.

The remainder of this Case, and part of Case 63, is devoted to the *Potato* (*Solanum tuberosum*, L.), our most important esculent, and various preparations from it, including Messrs. Chollet's dried compressed potatoes; British gum, an altered condition of potato starch, used for postage-stamps; starch, or 'English arrow-root,' etc.; also models of numerous cultivated varieties of the tuber. Observe—

No. 271. Plant of Potato, showing the tubers to be an altered (thickened) condition of subterranean stems.

CASE No. 272. An analysis of one pound of Potatoes, with the
63. constituent water, charcoal, starch (2oz. 11dwt. 4·8grs.), caseine (6 dwt. 9·6 grs.), etc., prepared by Professor Henslow.

No. 273. 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 CASE
the rather large ovate leaves. Found in waste places, often near 65.
old castles and ruins, in England and on the Continent.

NO. 274. HENBANE (*Hyoscyamus niger*, L.). An annual viscid
and hairy weed, growing in waste places about villages, with a
dingy yellow flower, veined with purple. Also a dangerous poison.

NO. 275. THORN APPLE (*Datura Stramonium*, L., and allied
species), a poisonous narcotic.

The remainder of this Case, as well as the whole of Cases 64
and 65, are devoted to TOBACCO, the dried leaf of species of
Nicotiana (principally of *N. Tabacum*, L., *N. rustica*, L., and
N. persica, Dun.), all, with good ground, believed to be of Amer-
ican origin. By far the greater proportion of the Tobacco con-
sumed in the United Kingdom, is the produce of the United
States. From Cuba, the northern provinces of South America,
Manila, etc., further supplies are obtained. Exhibited here are
various commercial conditions of the leaf,—cut Tobacco, Cigars,
Snuff, etc. The peculiar and characteristic narcotic principle of
Tobacco, is developed in the leaf after it is collected, by a fer-
mentative process, promoted by moistening it with syrup or brine.
Note in Case 65—

NO. 276. Specimens of ENGLISH GROWN TOBACCO.

In 1870, no less than 41,718,012 pounds of Tobacco were
entered for home consumption in the United Kingdom; the total
import, the same year, exceeding forty-eight millions of pounds.

NO. 277. A mounted specimen of BROOM-RAPE (*Orobanchæ*), CASE
showing its parasitism on Clover. It belongs to a small Order 66.
(*Orobanchaceæ*), characterized by parasitical habit, brown colour,
and absence of other than mere scale-like leaves.

A few of the products of the FIGWORT ORDER (*Scrophula-
riaceæ*), a numerous family, with a wide distribution, are here
exhibited. But few are prominent in economic use. Several are
highly valued as ornamental flowers, as *Calceolaria*, *Pentstemon*,
and *Paulownia*.

NO. 278. FOXGLOVE (*Digitalis purpurea*, L.). A tall and
handsome plant, frequent in hedges in Britain. A powerful
poison.

Labiæ Order (*Labiatae*). A large and well-marked group
of about 2300 species, prevailing in dry situations in the warmer
temperate regions. Marked botanically by the four-cornered stem,
opposite, dotted leaves, whorls of lipped (labiate) flowers, often of
great beauty, as in the *Salvia*, and a deeply four-lobed dry fruit.
The Order is destitute of hurtful properties. Many species are
highly fragrant and aromatic, as Sage, Pennyroyal, Lavender,

CASE 66. Peppermint, Marjoram, etc., specimens of which, with many essential oils, are here exhibited.

No. 279. **PATCHOULI**, the essential oil of *Pogostemon Patchouli*, Pell, a plant of India. A powerful perfume, now little used.

The remainder of Case 66 and part of Case 67 contains principally specimens of herbs in domestic use belonging to the Labiate Order.

CASE 67, 68. **Vervain Order** (*Verbenaceæ*), commences and is continued in Cases 67, 68. It is nearly allied to the *Labiates* in structure and essential properties. Many species in the tropics are large trees, as the Teak of India (*Tectona grandis*, L.), one of the most useful timber-trees, for ship and railway-carriage building.

No. 280. **TEAK**, quite sound, from Salsette in Bombay, supposed to be 2000 years old.

Observe the Fiddle-wood of Jamaica (*Cytharexylon*).

A few products afforded by the **ACANTHUS ORDER** (*Acanthaceæ*),—a tribe of plants chiefly tropical, including, besides many weeds, some very beautiful hothouse species, also products of the Primrose and Leadwort Orders, are contained in this Case.

The Orders which follow, and which are continued on the Ground Floor, are marked by flowers of comparatively simple structure, destitute generally of a corolla, and often 'imperfect,' i.e. with stamens or with pistil only.

Under the Poke-weed Order (*Phytolaccaceæ*), observe—

No. 281. Sections of the stem of *Phytolacca dioica*, L., a beautiful tree of South America, introduced into Spain, where it is planted to shelter public promenades.

CASE 69. **Goosefoot Order** (*Chenopodiaceæ*). 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. 282. **QUINOA**. The farinaceous seeds of *Chenopodium Quinoa*, Willd., a chief article of food on the slopes of the Andes of Chili, Peru, and Central America.

No. 283. Models of varieties of **BEEET-ROOT**, red and white, of market gardens. All forms, originated under cultivation, of *Beta vulgaris*, L.

No. 284. **SUGAR** from **BEEET-ROOT**. Extensively manufactured, principally in France and Central Europe, competing with the product of the Sugar-cane. [Mus. No. II. Case 34.] One ton of Beet-root is said to afford about 100 pounds of raw, or 55 pounds of refined sugar.

NO. 285. MANGOLD WURZEL, the root of a cultivated variety of the Beet (*Beta vulgaris*, L.), an herb growing wild on the coasts of Europe and West Asia, etc. Models of sorts used by farmers. CASE 69.

Buckwheat Order (*Polygonaceæ*). Mostly herbaceous plants, marked by the membranous sheathing base of the stalk of their alternate leaves. Widely diffused; many are common and troublesome weeds, as the Dock and Knotgrass.

NO. 286. MEDICINAL RHUBARB. The root of various species of *Rheum*. Although one of the most familiar and important of drugs, we are ignorant of the true source of some of the best varieties, which are believed to be afforded by species growing in Central Asia. [Specimens of Medicinal Rhubarbs, with flower and leaf of the plants affording them, gathered by an eye-witness of their identity, are important desiderata.] 'Rhubarb' of our gardens is the acid leaf-stalk of species of the same genus (*Rheum*).

NO. 287. BUCKWHEAT (*Polygonum Fagopyrum*, L.). Long cultivated on the continent of Europe, and generally in temperate countries, for its farinaceous seeds, from which an excellent bread is made. Often planted in Britain for feeding game and poultry. Its native country is scarcely determinable, though probably Russia or Western Asia.

The Collection is continued on the

GROUND FLOOR,

Round the corner to the left on reaching the bottom of the stairs.

Laurel Order (*Lauraceæ*). 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 from the mode in which their anthers open, by little valves or doors, as in the Barberry. CASE 70.

Observe sections of the wood of various Laurels, chiefly of Teneriffe and Madeira, in which islands they form magnificent ever-green forests.

NO. 288. 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 on the Continent in cookery. From the berries, a green odorous oil is obtained.

NO. 289. Wood of the GREENHEART (*Nectandra Rodiaei*, Schk.), a remarkably hard timber, of British Guiana, classed among the first eight woods at Lloyd's.

NO. 290. AVOCADO PEAR, fruit of *Persea gratissima*, Gært.

Grown in tropical America, West Indies, (where it is much esteemed,) and the Atlantic islands. Note also the wood of this plant.

CASE No. 291. **SASSAFRAS BARK and WOOD**, the produce of *Sassafras officinale*, Nees, a fine tree of the United States. Used in medicine as a sudorific.

No. 292. **CAMPHOR**, obtained, by distillation, from the wood of *Camphora officinarum*, Nees, a tree of Japan and China. The root, trunk, and branches, broken up, are heated with water, in closed vessels, the volatilized Camphor being sublimed upon Rice-straw. It is further refined on its arrival in Europe. [See also *Sumatra Camphor*, Case 9, No. 37.]

No. 293. **CINNAMON**, the bark of *Cinnamomum zeylanicum*, Nees, a tree of Ceylon. Specimens of unbarked branches, affording the different qualities of this valuable spice, with the instruments used in peeling it.

Upon adjoining shelves are specimens of the Cassia barks of commerce, '*Cassia lignea*' and '*Cassia vera*.' [It is probable that these barks may be afforded by several distinct species. Specimens of any Cassia bark, with leaves and flower of the tree affording it, also of the plant yielding '*Cassia buds*' of commerce, a native of Cochin China, would be of value.]

Of Cinnamon, 2,215,434 pounds were imported in 1870.

CASE 72. Under the small group of 'Plume Nutmegs,' including but some four or five species, very similar in some respects to the Laurels, and more or less fragrant, note—

No. 294. **SASSAFRAS BARK**, of Tasmania (*Atherosperma moschata*, Lab.), used in remote parts of the colony as Tea. It affords an essential oil.

Nutmeg Order (*Myristicaceæ*). Trees confined exclusively to tropical India and America: often characterized by their red, viscid juice. The aromatic qualities common to many of the group are especially marked in—

No. 295. **NUTMEGS**, the seeds of *Myristica moschata*, Thb. A beautiful tree of the Moluccas, scattered also in other islands of the East Indian Archipelago. The Nutmeg is contained within a fleshy pulp, which opens when matured.

Immediately enveloping the Nutmeg is the shell, outside which is an irregular fibrous-like network (aril), of a beautiful red colour when fresh,—this is '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.

No. 296. **Concrete OIL OF NUTMEG**, obtained in the Moluccas, from the seeds, by heat and pressure. Other species allied

to *M. moschata* yield inferior qualities of Nutmeg. 537,854 lbs. CASE
of Nutmegs were imported into the United Kingdom in 1870. 72,73,

Protea Order (*Proteaceæ*). Abounding in New Holland 74.
and at the Cape, with a few outlyers in India and South America.
Termed *Proteaceæ* 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
Cases 73, 74.

Observe the wood of *Protea grandiflora*, Thb., and 'Silver
Wood' (*Leucadendron argenteum*, R. B.) both Cape species.

Oleaster Order (*Elæagnaceæ*). Consisting of a few trees
or shrubs with their leaves more or less covered with minute sil-
very scales.

No. 297. Berries of *Shepherdia argentea*, Nutt. A North
American shrub. The mealy pulp of the berries is eaten by the
Cree Indians.

No. 298. TREBIZONDE DATES, the fruit of *Elæagnus orient-
alis*, L.f., used in Persia as dessert.

Spurge-Laurel or Lace-bark Order (*Thymelaceæ*). A
family of shrubby plants, with remarkably tenacious inner bark
(*liber*) and caustic juice, represented in our gardens and green-
houses by the *Mezereon*, *Pimelea*, etc. This Order is continued
in Cases 75, 76.

Two compartments of this cabinet are devoted to specimens CASE
of the fibrous bark of two or three Indian species, with paper 76.
made from it, of various qualities, and in different stages of
manufacture. *Daphne papyracea*, Wall., and *Edgeworthia Gard-
neri*, Meisn., are two of the Himalayan species affording paper-
fibre. Daphne paper is in common use in north-western India
for all important documents. It is extremely strong and durable.
The finer qualities are well suited for engravings.

No. 299. Stem, with the bark-layers partly turned back, of
the JAMAICA LACE-BARK (*Lagetta lintearia*, Lam.), a tree of
from twenty to thirty feet. The lace-layer is carefully removed
through considerable lengths of the stem, and made up in various
ornamental articles,—collars, purses, etc.

Under the *Eagle-woods*, a section of the *Lace-bark* Order, ob-
serve—

No. 300. EAGLE-WOOD OR LIGN-ALOES, imported into Syria
through Arabia. Probably the produce of *Aquilaria Agallocha*,
Roxb., a tree of south-eastern Asia, and perhaps identical with
the 'Aloes' of Scripture.

Under **Sandal-Wood Order**, which is continued in Case 77, note—

CASE 77. No. 301. SANDAL-WOOD afforded by an Indian tree (*Santalum album*, L.). Fragrant, and used to burn as incense in temples and private houses.

No. 302. Chinese Joss-sticks, in part made of Sandal-wood.

Observe, under the *Birthwort* Order, specimens of South American 'Guaco,'—the root of one or two species of *Aristolochia*, possessing considerable repute as a cure for the bite of serpents.

Note also the remarkably large flower of *Aristolochia Goldiana*, Hk. f., from western tropical Africa.

Spurge Order (*Euphorbiaceae*). A large family, consisting of from two to three thousand 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. They are characterized by a milky juice, which is often dangerously poisonous. Several species afford invaluable medicines: some, after the removal of their venomous juice, yield excellent farina.

No. 303. Boxwood (*Buxus sempervirens*, L.). A well-known evergreen tree of South and West Europe, growing in some wild-like situations in Britain, but perhaps introduced. Its dense, compact wood is admirably suited for the use of wood-engravers, for graduated scales, etc.

Note the model of a frigate in Box-wood, from a draft by Sir John Henslow, Chief Surveyor to the Navy: from this model nine vessels were ordered to be laid down in 1793-4. Presented by Professor Henslow.

No. 304. AFRICAN TEAK (*Oldfieldia africana*, Bth.). A valuable shipbuilder's timber, imported from the west coast of Africa. [True Teak, see Case 67.]

CASE 78. No. 305. The red powder rubbed off the fruit-capsules of *Malotus philippinensis*, Muell. (*Rottlera tinctoria*, Rxb.) It is the Kamala dye of India, used to dye silks yellow; also employed in medicine as a vermifuge.

No. 306. TALLOW from the seeds of *Stillingia sebifera*, Michx., 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.

No. 307. CANDLE-NUT OIL, from the seeds of *Aleurites triloba*, Forst. The seeds, strung upon a stick, are burnt as candles in the Sandwich Islands.

No. 308. Fruit of SAND-BOX TREE (*Hura crepitans*, L.). CASE
The valves of the fruit separate with much violence when mature and dry. 78.

No. 309. 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. 310. 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 scattered widely through tropical and warm countries. Known from antiquity as a valuable laxative medicine.

No. 311. 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*.

No. 312. CASSAVA or MANDIOCCA Meal, obtained from the root of two species of *Manihot* (*M. utilissima*, Pohl, and *M. Aipi*, Pohl,—*Jatropha*, Linn.), the former, Bitter, the latter, Sweet Cassava.

The juice of 'Bitter Cassava' 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 thirty to forty pounds, contain much farinaceous matter, separated from its venomous juice by careful washings, after being grated.

No. 313. CASSAVA biscuits.

No. 314. MANDIOCCA-STRAINERS. Long, cylindrical, plaited baskets in which the grated pulp is put after washing and thoroughly drained.

No. 315. MANDIOCCA-GRATER, studded with particles of granite, secured in the tough wooden frame by the viscid juice of *Couma dulcis*, Aubl., one of the Dogbanes.

The remainder of this Case is devoted to CAOUTCHOUC, or INDIA-RUBBER.

No. 316. Specimen of *Hevea* (*Siphonia*) *brasiliensis*, Kth., affording the best Caoutchouc, exported from Pará in Brazil. The juice is obtained by incisions cut through the bark; it falls freely from any wound. The stiffening milky juice is plastered over bottle-shaped clay moulds, the clay being removed, when sufficiently coated, by washing. Other species of *Hevea* yield juice abounding in Caoutchouc of various qualities.

Many of the numerous applications of Caoutchouc are here illustrated by a large series of specimens presented by Messrs. Hancock and McIntosh. [Other Caoutchoucs are afforded by

Ficus, Case 84, and *Urceola*, Case 59. In Central America by *Castilleja elastica*, Cerv., Case 82.]

The total importation of Caoutchouc into the United Kingdom in 1870 amounted to 152,118 cwts.

CASE 79. Part of Case 79 is devoted chiefly to undetermined fruits and woods of the Spurge Order.

Pitcher-plant Order (*Nepenthaceæ*). A small but very extraordinary group of South-eastern Asia, presenting several botanical anomalies. Especially remarkable from 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.

Nettle Order (*Urticaceæ*). An important group represented in almost every climate by trees or herbs bearing rough leaves, often formidably armed with stinging hairs. The economic value of the 'Nettle Order' 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.

The common Nettle, the young tops of which are used as a pot-herb, represents the Order almost everywhere in Europe.

NO. 317. CHINA-GRASS (*Bahmeria nivea*, H. and A.), a Nettle of China, India, and the Indian islands, affording the valuable RHEA fibre. Specimen fabrics made of it are here exhibited. Other Indian species (including certainly *Maoutia Puya*, Wedd., and *Girardinia heterophylla*, Decn.) afford a fibre used for cloth, sails, cordage, fishing-nets, etc., in India.

[Specimens of Indian Nettle-cloths, accompanied by dried examples of the plants affording the fibre, would be valued.]

CASE 80. One compartment of case 80 contains chiefly cordage, cloth, etc., prepared from undetermined species of the Order.

NO. 318. Parasol-cover made of the fibre of the COMMON NETTLE (*Urtica dioica*, L.).

Hemp Order (*Cannabinaceæ*). Closely allied in all respects to the Nettle Order, of which it may be regarded as a section. The most important species is Hemp (*Cannabis sativa*, L.), cultivated in cool climates for its invaluable fibre; in tropical India, etc., 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 unacquainted with it.

NO. 319. GUNJA and

NO. 320. BHANG, the former, the dried flowering branches, the latter, the leaves and capsules of Hemp, cultivated in the

warm parts of India, where an intoxicating resin is secreted by CASE the plant. 'Gunja' is usually smoked, 'Bhang,' infused and 80. drunk in water, etc. *Hashish*, or *Hachich*, is a preparation of the resinous leaves used as an intoxicant by Arab tribes.

NO. 321. CHURRAS, the gum-resin of the Hemp-plant. Employed in medicine.

NO. 322. HEMPSEED OIL.

Specimens of Indian, Russian, Prussian, Spanish, and Italian Hemps, are exhibited, with Hempen cordage, etc., 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 (page 16).

NO. 323. Samples of 'HOPS' used by English Brewers; the 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 over several centuries in Northern Europe, from the period of the Celts and old Germanic nations, for the sake of its odorous and resinous cones used in brewing.

Bread-fruit Order (*Artocarpeæ*). A group of tropical CASE trees or shrubs closely related to the 'Nettles;' marked by a milky 81. juice and the large scales (stipules) at the base of each leaf-stalk, which, as in the 'Fig Order,' fall and leave a ring-like scar.

NO. 324. BREAD-FRUIT (*Artocarpus incisa*, L.). A staple food of the South Sea Islanders. Introduced into the West Indies. Observe biscuits, etc., made of the 'Bread-fruit.'

NO. 325. JACK-FRUIT (*A. 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 Sanskrit name of the fruit, 'Tchackka.' The wood is valuable for furniture.

In this Case are specimens of Caoutchouc from Central Ame- CASE rica, the produce of *Castilloa elastica*, Cerv. 82.

NO. 326. LETTER or LEOPARD-WOOD of Central America (*Piratinera guianensis*, Aubl.).

NO. 327. UPAS. Concrete juice of *Antiaris toxicaria*, Lesch., a Javanese tree, respecting which the most fabulous stories have been circulated of its extremely poisonous character. The juice is however a virulent poison, and is said to be used by Javanese tribes to tip their arrows.

Observe the remarkable 'sacks' exhibited in this case, made without seam, of the bark of *Lepurandra* (*Antiaris*) *saccidora*, Nim., by soaking and beating the trunk until the bark is suffi-

ciently loosened to turn inside-out. A portion of the stem remains at the end to serve as a bottom. Made in Western India.

- CASE 83. The first compartment of this Case is entirely devoted to a series of Cloths made from the fibrous inner bark of plants of the Bread-fruit Order.

Fig and Mulberry Order. A tribe closely allied to the foregoing. Including in the 'Fig' genus, some of the finest trees of tropical forests. The BANYAN (*Ficus indica*, L.), remarkable for its enormous extension by means of rooting branches, is one of the most famous trees of India. The milky juice afforded by some, yields caoutchouc.

Observe a large collection of TAPA cloths and paper fabricated by the Polynesian Islanders, from the fibrous bark of the Paper Mulberry (*Broussonetia papyrifera*, Vt.), with club and shells used in beating and preparing it, also the blocks used to print coloured patterns upon it.

- CASE No. 328. MULBERRIES. The fruit of *Morus nigra*, L., and 84. *Morus alba*, L. Originally native of Asia Minor and the Caspian. Cultivated extensively in Southern Europe and China, both for the fruit, and the leaves, which are the food of the silkworm.

No. 329. FUSTIC, the hard wood of *Maclura tinctoria*, Nutt. Chiefly imported from the West Indian Islands and Brazil. It is largely used in dyeing yellow.

No. 330. OSAGE ORANGE. Fruit of *Maclura aurantiaca*, Nutt. A North American tree. Its yellow juice was formerly used by the Indians to disfigure their faces in war-time.

No. 331. FIGS. The well-known heads of fruit of *Ficus Carica*, L., long cultivated towards the Mediterranean and in West Asia; considered to have been native originally of Asia Minor, Persia, etc., and perhaps of South-east Europe and North Africa. Figs are often mentioned in the sacred writings.

No. 332. 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.

No. 333. CAOUTCHOUC, yielded by *F. elastica*, Rxb., a handsome Indian tree, with firm glossy leaves: often a parlour plant in England. Its milky juice affords about one-third its weight of Caoutchouc.

- CASE No. 334. LAC. Thread-, Block-lac, etc. A resin produced 85. by the puncture of a small hemipterous insect abounding in India, upon various trees, but especially the 'Peepul' (*F. religiosa*, L.), *Butea frondosa*, Rxb. (*Leguminosæ*), a *Celtis*, etc.

No. 335. Lacquered work from Scinde and Kashmir. CASE

No. 336. Branch of a *Ficus* with 'tears' of LAC exuding from it. 85.

'Elm Order' (*Ulmaceæ*), American and European species of which are valuable timber-trees; the English Elm being especially suited for works constantly wet. Also the 'Podostemon Order,' moss-like plants growing in fresh water, chiefly in tropical countries.

No. 337. SALT, called *Cuarura*, from the Uaupès branch of the Amazon. Prepared from a *Podostemaceæ*.

Peper Order (*Piperaceæ*). 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. CASE 85 A.

No. 338. KAVA BOWL. A much larger example stands near Case 74.

No. 339. KAVA ROOT (*Piper methysticum*, Forst.), used in the Society and South Sea Islands, in the preparation of an abominable beverage, prepared by chewing the root and ejecting the saliva into large bowls, in which it is fermented, etc.

No. 340. PEPPER. Black and white. The fruit of *Piper nigrum*, L., a climbing Indian shrub, cultivated in India, the Indian Islands, and West Africa. 'Black Pepper' consists of the dried unripe berries; 'White Pepper' is the ripe fruit deprived of its rind by macerating. 19,339,491 lbs. of Pepper were imported into the United Kingdom in 1870.

Observe 'Long-Pepper,' the dried unripe fruit-spikes of *Chavica Roxburghii*, Miq., an Indian plant; also 'Cubebs,' dried fruits of *Cubeba officinalis*, Miq., etc., used in medicine.

No. 341. MATICO. The coarse leaves of *Artanthe elongata*, Miq. A Peruvian plant, used as a styptic.

Under the small 'Myrica Order,' note specimens of the wax obtained from the berries of various species of *Myrica* (*M. cerifera*, L., *M. cordifolia*, L., etc.), growing in Central America and the Cape. CASE 85 B.

Willow Order (*Salicaceæ*). Well represented by our Sal- lows, Osiers, and Poplars. This Order is commenced in Case 85 B, and continued in Case 86 and 87. Observe numerous specimens of the wood of various species, and baskets in different stages of construction, made of the twigs of Osier (*Salix viminalis*, L., *S. vitellina*, E.B., etc.); also Exchequer tallies (formerly made of Hazel, Alder, or Willow), with an account of the mode of using them; Willow plait, Sussex truck-baskets, sabots, clothes-pegs, etc., of Willow wood.

- CASE Nut and Hazel Order (*Corylaceæ*).** Including some most valuable timber-trees,—the Oak, Beech, etc. Very common in the forests of temperate countries; many species of Oak and Chestnut extend to the Himalaya and Indian islands. The bark and acorn-cups of some Oaks contain an astringent principle.
87. Observe specimens of OAK timber (*Quercus Robur*, L., and varieties) from various European ports, also of English growth. The collection of wood specimens of European, American, and Asiatic species of *Quercus* is continued in Case 88.
- CASE No. 342. REFUSE OAK-BARK**, from tanyards, used as fuel in South France.
89. **No. 343. ENGLISH 'COFFICE'** and other barks, used by tanners.
- No. 344. QUERCITRON**, the bark of *Q. tinctoria*, L., a useful yellow dye.
- No. 345. VALONIA**, the Acorn-cups of *Q. Ægilops*, L., imported from Greece and Asia Minor, for the use of tanners and dyers. 25,781 tons of Valonia were imported in 1870.
- Note the specimens of OAK-GALLS formed upon the leaves and twigs of Oak, which have been punctured by minute insects (*Cynips*, *Aphis*, etc.). Very valuable as sources of Gallic and Tannic Acids.
- No. 346. GALL-NUTS**, from the puncture of a *Cynips*, on *Q. infectoria*, Ol., a shrubby oak of Asia Minor. Galls produced on other species are also met with in commerce.
- No. 347. GALLIC ACID**, obtained from infusion of Gall-nuts exposed to the air.
- No. 348. TANNIN**, extracted by Ether from Nut-galls. The union of Tannin with the gelatine in the hides constitutes 'Leather.'
- The two remaining compartments of this Case are devoted to specimens of Oak of historical interest, Bog-Oak, etc.
- No. 349. BOG-OAK**, dug up from under the Roman (Hadrian's) wall.
- No. 350.** Portion of a pile of old London Bridge, in use about 650 years; taken up in 1827.
- No. 351.** Block from 'Herne the Hunter's Oak.'
- No. 352.** A block recovered in 1840 from the wreck of the 'Royal George,' sunk in 1782 at Spithead.
- No. 353.** Series showing stages in the manufacture of the Oak and Elm fasteners used to secure rails to the 'shoes' and 'sleepers' on Railways.
- CASE** Specimens of Bark, stem-sections, etc., of the Cork-Oak (*Q. Suber*, L.), growing in Spain, South France, and Italy. 'Cork' is the thick, outer bark, which may be removed from the same
- 90.

tree at intervals of six to ten years after it attains an age of about thirty 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.

No. 354. 'NUTS,' the well-known shell-fruit of *Corylus Avel-lana*, L., and its varieties. Chiefly imported from Asturias and the Mediterranean provinces of Spain. CASE 91.

No. 355. Wood of the CHESTNUT (*Castanea vesca*, Gært.). A valuable and highly ornamental European tree, attaining, sometimes, an enormous size.

Chestnut copses furnish, in France, hoops and vine-props.

No. 356. BEECH-OIL, obtained in France from the fruit of the Beech (Beech-mast). Used for food and burning.

No. 357. Wood of the BEECH (*Fagus sylvatica*, L.). A fine forest tree, affording a valuable tenacious and flexible wood.

No. 358. LAST and BOOT-TREE, models. Usually made of Beech.

No. 359. Specimens of the wood of the TASMANIAN MYRTLE (*Fagus Cunninghamii*, Hk.), abounding in the forests of Tasmania; often attaining a height of two hundred feet, with a girth of forty feet.

The lower shelves of the last compartment contain 'Birch bark' (*Betula papyracea*), and its various applications of use and ornament, from Canada, Switzerland, Norway, etc.

No. 360. BREAD made of BIRCH BARK, from north-west America. CASE 92.

Beefwood Order (*Casuarinaceæ*). 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, etc.

Walnut Order (*Juglandaceæ*). Important in economic botany, from the value of the timber of two or three species and the fruit of the Walnut and Hickory.

No. 361. 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.

No. 362. WALNUT OIL, expressed from the kernels. Used as an article of food. Expressed with heat, it is a drying oil, much used in the arts.

No. 363. WALNUT CAKE, remaining after the expression of the Oil; used for cattle-feeding in the North of Italy.

CASE No. 364. WALNUT WOOD. The chief cabinet-wood of Europe before the introduction of Mahogany.

CASE No. 365. BLACK WALNUT (*Juglans nigra*, L.). The wood much used in the United States for cabinet-work.

No. 366. BUTTERNUT WOOD (*Juglans cinerea*, L.) of the United States.

No. 367. HICKORY NUTS, *Carya alba*, Nutt., and *C. tomentosa*, Nutt., the former species affording the principal supply.

Observe the remarkable structure of the wood, shown in cross sections, of the 'Joint-Firs' (*Gnetum*), a tribe closely related to the Pine Order. Note also the plant, flower- and fruit-cones of *Welwitschia mirabilis*, Hk. f., a remarkable dwarf tree of South-West Africa, discovered in 1859 by Dr. Welwitsch, and described by Dr. Hooker in the Transactions of the Linnean Society (vol. xxiv. 1). Fine specimens of these plants are also exhibited in Museum No. III.

Pine Order (*Coniferae*). So called from the heads of fruit being usually arranged in dense cones. The Order is a large and highly important one, consisting of noble timber trees or shrubs, generally with narrow, rigid, and evergreen leaves. The Scotch Fir, Cedar, and Yew, are well-known examples. The wood is characterized by the absence of pores (vessels) and by peculiar disk-like microscopic markings on its cells.

The specimens and products afforded by the Order extend to Case No. 100. In Cases 93 (in part), 94, and 95, a valuable series of CONES is arranged; also, specimens of the wood and sundry products. The RESINS which abound in and characterize the Order, are exhibited together in Case 98.

Under *Taxaceæ* (a section of the Pine Order) note—

No. 368. YEW (*Taxus baccata*, L.), from Syon House. The favourite wood for the long-bows of olden time. The juicy red cups of the fruit are harmless, but the leaves are very poisonous.

No. 369. WOOD OF HUON PINE (*Daerydium Franklinii*, Hk. fil.). A tall Tasmanian tree, suited for planking and boat-building. [A cabinet chiefly made of this wood stands on the 'Middle Floor' near Case 61.]

No. 370. PINE DRIFT-WOOD, brought from the Arctic regions.

Of the true Cone-bearing species, under the genus *Pinus*, marked by needle-like, evergreen leaves, and hard cones with thickened scales, note—

No. 371. SCOTCH FIR (*P. sylvestris*, L.), an important timber-tree, much planted in Britain, and generally distributed through North and Central Europe; affords 'Yellow Deal,' and a large proportion of the 'Tar' used in Europe.

Observe the cones of *P. sylvestris*, L., *P. halepensis*, Mill.

(South Europe), *P. Pinaster*, Ait. (France, Italy, etc.), *P. Pinea*, CASE L. (South Europe), *P. pungens*, Lb. (United States), etc. 93.

No. 372. PINE-WOOL, prepared from the leaves of *P. sylvestris*, L., and used for stuffing cushions, felting, etc.

No. 373. SOAP, made from oil obtained from the leaves of the same species.

No. 374. Edible SEEDS of the STONE PINE (*P. Pinea*, L.), strung together as brought to market in Lisbon.

Note Cones of the Himalayan Pines, *P. Gerardiana*, Wall., and CASE *P. longifolia*, Lamb.; the North American—*P. Coulteri*, Don, P. 93, 94. *rigida*, Mill., *P. insignis*, Dgl., *P. Sabiniana*, Dgl., etc.

No. 375. WOOD of the WEYMOUTH PINE (*P. Strobus*, L.). The most valuable timber fir of North America.

No. 376. PAPER, from sawdust of same.

Under the section or genus *Abies*,—the Spruce-Firs,—with CASE shorter and flatter leaves than true Pines, and the scales of the 95. cones thinner,—

Observe the cones of *A. nobilis*, *A. pectinata*, DC., *A. Douglasii*, etc.

No. 377. NORWAY SPRUCE (*A. excelsa*, DC.). The 'White Deal' of carpenters. Affords Burgundy Pitch.

No. 378. PLANKS of DOUGLAS PINE (*A. Douglasii*, Ldl.), grown in Northumberland.

No. 379. BARK of the HEMLOCK-SPRUCE (*Abies canadensis*, Mx.), employed in tanning.

No. 380. BREAD made of PINE-BARK and MOSS, eaten in time of scarcity in Finland.

In this Case are miscellaneous articles made of the wood of CASE the Pine and Spruce,—as toys, fire-lighters, matches, etc. Note 96. the interesting series illustrating the manufacture of children's toys, as carried on in Saxony.

No. 381. MAT, BASKET, ROPE, etc., of Pine-shavings. Used in Sweden.

No. 382. PINE SHINGLES, used in Switzerland to cover walls of houses, overlying each other as tiles.

No. 383. WOOD of LARCH (*Larix europæa*, DC.). Exceed- CASE ingly strong and durable. Affords Venice turpentine. 97.

No. 384. BARK of the same, used in tanning.

No. 385. CONES of the three forms of CEDAR, from Syria, Himalaya, and Atlas.

No. 386. CEDAR-WOOD (*Cedrus Libani*, Loud., and vars.). Native on the Lebanon and Taurus, and under slightly different forms on the Himalaya (*C. Deodara*, Rxb.) and Atlas (*C. atlantica*, Man.). Emblematic, in the sacred writings, of grandeur and power.

CASE No. 387. Cast of FOSSIL CONIFEROUS CONE (*Pinites macrocephalus*). Lower green-sand, Kent.

The last compartment of this Case contains cones of several species of *Dammara*, also *Cunninghamia sinensis*, Rich, *Sciadopitys verticillata*, S. et Z., etc.

CASE No. 388. CONES OF NORFOLK ISLAND PINE (*Araucaria excelsa*, Ait.).

No. 389. CHILI PINE (*A. imbricata*, Pav.).

No. 390. BUNYA-BUNYA PINE (*A. Bidwillii*, Hk.).

No. 391. Seeds of same, used as food by the Aborigines of Moreton Bay, Australia.

No. 392. Wood of Norfolk Island Pine, and candlesticks made of the same.

No. 393. *A. brasiliensis*, Lb. South Brazil.

Observe fine specimen of branch of *Araucaria Rulei*.

The last compartment of this Cabinet is devoted to the resinous products of the Pine-tribe,—Tar, Pitch, Turpentine, Balsams, and Resins.

No. 394. DAMMAR, COWDI OR KAURI RESIN, afforded by *Dammara australis*, Lb., the New Zealand 'Cowdi Pine.' Used in varnish-making. The largest masses are found buried in the soil, in many places far from where the trees now grow.

No. 395. Resin of *D. orientalis*, Don, a giant tree of the East Indian Islands.

No. 396. TURPENTINE. The principal supply is from America, and is obtained chiefly from *Pinus palustris*, Mill. It exudes from wounds made in the trunk, near the ground.

No. 397. STRASBURG TURPENTINE. Rarely seen. From blisters in the bark of *Abies picea*, Mill.

No. 398. VENICE TURPENTINE, from the Larch (*Larix europæa*, DC.).

No. 399. TAR, from Archangel, Stockholm, etc. Chiefly obtained in Sweden and Russia, from the Scotch Fir (*Pinus sylvestris*, L.), by a process of dry distillation. Billets and roots of the Pine being burned in a closed pit, the Tar exudes, flowing into barrels, which are bunged for exportation as soon as filled.

No. 400. BLACK PITCH. The residuum in the distillation of Pyroligneous Acid from Wood-tar.

No. 401. COMMON FRANKINCENSE, or THUS. A spontaneous exudation from the Spruce (*Abies excelsa*, DC.).

No. 402. BURGUNDY PITCH, obtained also from the Spruce, chiefly in Western Switzerland. So often impure that other and cheaper sorts are usually substituted for it, under the same name, in trade.

NO. 403. CANADA BALSAM, from *Abies balsamea*, Marsh., and CASE
A. Fraseri, Pursh. 98.

NO. 404. ROSIN, OR COMMON RESIN. The residue after distillation of Oil of Turpentine. The colour depends upon the degree to which the process is carried.

NO. 405. JUNIPER BERRIES. The succulent, resinous, and CASE
rather sweet fruit of *Juniperus communis*, L., a European and 99.
British shrub. Used in Belgium, North France, etc., in the preparation of gin.

NO. 406. Stages in the manufacture of pencils.

NO. 407. Wood of *Juniperus virginiana*, L., and its variety,

NO. 408. *J. bermudiana*, L., both affording the so-called
'Pencil Cedar,' employed in the manufacture of lead-pencils.

NO. 409. Cones of *Wellingtonia gigantea*, Ddl., from the Sierra Nevada, California. A tree has been described 450 feet in height, with a circumference of 116 feet. The oldest trees are not believed, by Dr. A. Gray, much to antedate the Christian era.

NO. 410. SANDARACH, the resin of *Callitris quadrivalvis*, CASE
Vent.; powdered, it is 'Pounce,' used to sprinkle over freshly- 100.
written documents.

NO. 411. Vases made of the wood of *Callitris quadrivalvis*,
Vent., an Algerian tree; presented by the Prince Jerome Bonaparte.

NO. 412. OYSTER-BAY PINE (*Frenela rhomboidea*, Endl.),
from Tasmania.

NO. 413. CYPRESS-WOOD (*Cupressus sempervirens*, L.). Aromatic, compact, and almost imperishable.

NO. 414. Wrapper, made of the bark of *Thuja gigantea*,
Nutt., a North-west American tree.

Cycas Order (*Cycadaceæ*). A small group of Palm-like shrubs or trees, in the structure and mode of arrangement of the flowers, presenting some analogy with the Pine Order. Natives, mostly, of Mexico, the Cape, and tropical Asia. Fossil cones and a trunk of the Order have been found in the lower greensand, Kent, and at Portland. None are now native in Europe.

NO. 415. Cones of *Encephalartos horridus*, Lehm., and—

NO. 416. *E. pungens*, Lehm. South African shrubs, with fiercely-armed, spinose leaves. The cones have been ripened in Britain. Living specimens are in the 'Palm-store.'

NO. 417. SAGO. Prepared from the nuts of *Cycas circinalis*, CASE
L., in Ceylon and Western India. Much used by the poorer 101.
natives. [Sago, see Museum No. II., Case 87.]

NO. 418. Sections of wood of *Cycas revoluta*, Thb., showing a cellular pith-like mass, traversed by rings and bundles of woody fibre.

Rhizanthææ. Under this head are collected a few most

CASE 101. anomalous plants of very different structure, agreeing in the absence of green colour and leaves, and in their parasitism upon the stems and roots of other vegetables.

No. 419. CUPS, used by the Lepchas, Tibetans, etc., made from knots formed on the roots of Oaks, Maples, etc., by the parasitical *Balanophora involucreta*, Hk. fil. Some of these, esteemed antidotes to poison, fetch a great price.

No. 420. CANDLES, made in New Granada, of the waxy secretion contained in the tissues of *Langsdorffia hypogæa*, Mart. *Balanophora elongata*, Bl., furnishes a wax similarly used in Java.

No. 421. 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, in Museum No. III.

On the staircase and on the wall-space over the several fire-grates are hung numerous portraits of eminent botanists and travellers. Nearly the whole of this collection was got together by the late Sir W. J. Hooker, and after his death was purchased by the Government for this Museum.

MUSEUM No. II.

The botanical character of the plants represented by the specimens and products in this Museum (exclusive of those in the Table-cases, also Wall-cases of Rooms 4, 9, and 10, which belong to 'Flowerless Orders,' or miscellaneous objects), are chiefly these:—1st. The embryo plant, in the ripe seed, has but *one* seed-leaf (*cotyledon*, hence called *Monocotyledons*), and the first leaves alternate. 2. The species having woody stems, form isolated bundles of wood which usually do not increase in thickness year by year; once formed, they remain unaltered in diameter, scattered through the pith-like substance of the stem. 3. The parts of the flower are usually in *threes*. 4. The veins of the leaves, excepting in a few Orders, are parallel, or if diverging, not irregularly netted.

The Collections occupy two Floors, commencing in Room No. I., a small apartment on the Upper Floor, near the top of the stairs. The number of each 'Room' is usually affixed above, or by the side of the doorway leading into it. The Cases and objects specified in the Guide are numbered consecutively from Room No. I.

UPPER FLOOR.

ROOM No. I.

CASE 1. **Yam Order** (*Dioscoreaceæ*). A group of twining shrubs

with large tubers, together with the following Order, characterized by having *net-veined* leaves; differing in this respect from most other Monocotyledons. CASE 1.

NO. 1. YAMS. The tubers of various species of *Dioscorea*, cultivated in nearly all tropical countries as important esculents. The tubers abound in farinaceous matter, and often reach a large size, weighing from thirty to forty pounds. Their culture is considered to have spread from South-east Asia and the East Indian islands, where at present *D. alata*, L., is the most commonly grown.

NO. 2. BISCUITS made of the flour of YAMS, from Jamaica.

Sarsaparilla Order (*Smilacæ*). Observe specimens of the *Sarsaparillas* of commerce.

NO. 3. The underground stem (rhizome) of various species of *Smilax*, growing in South and Central America, Mexico, and the West Indies. The determination of the species affording the Sarsaparillas employed in medicine is very difficult. *S. officinalis*, H.B.K., *S. papyracea*, Poir. (Brazilian), *S. medica*, Schl. (Mexican), are among the species affording the supply.

[Specimens of the rhizome, with a flowering branch of any Sarsaparilla-producing *Smilax*, would be valued.]

NO. 4. CHINA ROOT (*Smilax China*, L.), brought from China and Japan. CASE 2.

Under the small aquatic Order, the 'Frogbits,' widely diffused over the globe, note—

NO. 5. The 'NEW WATER-WEED' (*Elodea canadensis*, Rich.). This species is abundant in North America, whence it has been introduced into Britain: within the past sixteen or seventeen years it has rapidly spread through the canals and ponds of the United Kingdom, especially in the midland counties, where it obstructs navigation. Only female plants have been found in Britain.

Orchis Order (*Orchidaceæ*). A large and very remarkable group, marked by flowers of very irregular and anomalous form, often of great beauty. It grows all over the world, excepting in very cold and dry regions. In cool climates the species are usually terrestrial, while in the tropics they are generally found growing upon the trunks of trees, etc. (epiphytes). From the beauty and singularity of their flowers, many are cultivated in our hothouses. Few afford economic products.

NO. 6. VANILLA. The fragrant fruit of *Vanilla planifolia*, And., collected in Mexico. It is used in confectionery to flavour chocolates, creams, liqueurs, etc. Other allied species of *Vanilla*, growing in South and Central America, afford fragrant fruits, inferior in quality to the Mexican. CASE 3.

CASE 3. Ginger Order (*Zingiberaceæ*). Tropical herbs, with aromatic, creeping, root-like stems (rhizomes), and very irregular flowers. The greater number are East Indian.

NO. 7. GRAINS OF PARADISE, the pungent seeds of *Amomum Melegueta*, Rosc., a West African herb; used to give 'strength' to spirits, beer, etc., and in veterinary medicine. [Of allied species affording similar seeds, specimens in flower and fruit, with the leaves, are requested.]

CASE 4. NO. 8. CARDAMOMS, the fruit of *Elettaria Cardamomum*, Mat., a perennial herb of the East Indies. Used in flavouring and in medicine. 'Ceylon Cardamoms' are the produce of *E. major*, Sm.

NO. 9. TURMERIC, the powdered rhizome of *Curcuma longa*, L., commonly cultivated in India, also in China. It is used as an aromatic condiment in curries, Indian cookery, etc., as a colouring ingredient, and test for the presence of alkalies, which change its colour to a brown.

NO. 10. EAST INDIAN ARROWROOT, obtained from the tubers of *C. angustifolia*, Roxb.

NO. 11. ZEDOARY. The aromatic tubers of an allied *Curcuma*, used in medicine.

NO. 12. GINGER. The root-like stem of *Zingiber officinale*, Rosc., cultivated in the warmer parts of Asia, the West Indies, Sierra Leone, etc. Of this well-known condiment several varieties are known in trade, distinguished by their quality, country of growth, etc. Gingers are either 'coated' with the shrivelled rind, or 'scraped,' having it removed. Ginger is sometimes 'bleached' by chloride of lime, or 'white-washed' with lime and water. 33,854 cwts. of Ginger were imported in 1870.

Specimens of Ginger from the East and West Indies, Africa, etc., are exhibited.

NO. 13. PRESERVED GINGER. The young shoots of the rhizome, peeled and preserved in syrup.

At the opposite end of the room,—

CASE 5. Case 5 contains baskets and matting made of the large, ribbed leaves or split stems of certain of the 'Arrow-root Order' (*Marantaceæ*); a group very closely resembling the 'Gingers,' growing in hot countries.

NO. 14. Mat constructed of strips of the stem of *Phrynium dichotomum*, Rxb., brought from Silhet by Dr. Hooker.

NO. 15. Rhizome of the ARROW-ROOT plant (*Maranta arundinacea*, L.) of the West Indies; chiefly cultivated in St. Vincent and Barbadoes.

NO. 16. West Indian ARROW-ROOT, the starch obtained by washing, from the rhizomes of the above.

No. 17. TOUS-LES-MOIS. Starch from the tubers of *Canna edulis*, Ker. Commonly used by invalids. The microscopic granules of Tous-les-Mois are larger than those of any other starch used as food. CASE 5.

Plantain Order (*Musaceæ*). A small though highly important group of plants, with large sheathing leaves, chiefly tropical. Two or three species afford invaluable fruits (Bananas and Plantains); the leaves yield an excellent fibre. Numerous specimens of Plantain fibre, with matting, cloth, cordage, etc., made of it, are exhibited. CASE 6.

No. 18. MANILA HEMP, the fibre of *Musa textilis*, Nees, with many of its applications.

Imported from the Philippine Islands.

No. 19. Cordage, paper, etc., manufactured from MANILA HEMP. CASE 7.

No. 20. BANANAS, the fruit of *Musa sapientum*, Br., a species cultivated everywhere in the tropics, under one or other of its varieties. In India, China, and the East Indian islands, the culture of 'Bananas' dates from extreme antiquity. There is no sufficient evidence of their existence in the New World prior to its discovery.

The variety yielding the 'Plantain' (*M. paradisiaca*, L.) scarcely differs from the true 'Banana.' These fruits are of the greatest importance as food in tropical countries.

No. 21. Flower-spike of the ENSETE of Bruce (*Musa Ensete*, Gmel.), from Abyssinia.

No. 22. Fruit of the TRAVELLER'S TREE of Madagascar (*Ravenala madagascariensis*, Sonn.), showing the seeds surrounded by a bright blue aril; brought by Mr. Ellis from Madagascar.

Iris Order, familiar to us in the Yellow Flag and Crocus. Many beautiful Cape species are cultivated. CASE 8.

No. 23. SAFFRON, the dried stigmas (the trifold orange-coloured tops of the central organ of the flower) of *Crocus sativus*, All. Native in Asia Minor; cultivated in Egypt and South Europe. It is used as a colouring ingredient and for flavouring confectionery.

Observe, under 'Tacca Order,'—

No. 24. Starch from the tubers of *Tacca pinnatifida*, L., and one or two allied species. A most important article of food in the South Sea Islands.

Under 'Amaryllis Order,' a group resembling the 'Lilies,' differing in having the ovary *below* the whorls of the flower (represented by the Daffodil and Snowdrop, also many handsome exotic species (*Crinum*, etc.) grown in plant-houses), note—

CASE No. 25. Fibre of *Agave americana*, L., called 'American Aloe,' with various fabrics made of it. The juice of the *Agave* affords, when fermented, a liquor much used in Mexico, called *Pulque*.

CASE Pine-apple Order (*Bromeliaceæ*). American hard and dry-leaved plants, familiar to us in—

No. 26. PINE-APPLE (*Bromelia Ananas*, L.). Introduced into the tropics of the Old World, where, as in the jungles of India and the East Indies, it has become naturalized.

No. 27. FIBRE from the leaves of the PINE-APPLE.

'Pita,' and other fibres, afforded by species of *Bromelia* (*B. Pinguin*, L., etc.), with articles manufactured from them, are exhibited.

Room No. II.

Grass Order (*Gramineæ*). Familiar to us, clothing our meadows, pastures, and waysides. These, however, feebly represent the gigantic grasses of the tropics, some of which, as the Bamboos, attain a height of 100 feet or more. Of this most important Order, there may be about from 3500 to 4000 species, including all the Cereals—Wheat, Rice, Indian Corn, etc., our most important bread-producing plants. The Order is continued in Room No. III.

CASE Room No. II. is devoted to Bamboos (*Bambusa arundinacea*, 10, 11, Retz, and allies). The stem, entire or split up into fine strips, 12. and the broad leaves, are applied in China, India, and the East Indian islands, to a great variety of purposes. The young shoots are eaten; from the juice a fermented drink is prepared; the larger jointed stems serve as water-vessels, while very small ones are suspended as ear-rings, etc. Walking-canes, fishing-baskets, blow-tubes and arrows, bowls, curious Chinese ornaments carved out of the Bamboo root-stock, window-blinds, bow and arrow of a tiger-trap, guitar, flute, comb, brushes, cloth, paper, chair, umbrella, etc., are among the sundry articles here exhibited, constructed of Bamboo. Observe in

Case 12, TABASHEER, a siliceous deposit (Silica, 70, Potash and Lime, 30 per ct.), obtained from the joints of the Bamboo.

No. 28. Porcelain cup, covered with split Bamboo of remarkably fine workmanship, from Japan.

Observe, suspended in the passage, a series of Diagrams, explanatory of the structure of flowers, fruits, etc., prepared by Professor Henslow for the Committee of Council on Education, Also a portion of the celebrated 'Dragon-tree' (*Dracæna Draco*, L.), of Orotava, Teneriffe. It was known to be a very ancient tree in 1406, and was destroyed by a gale in 1867.

ROOM No. III.

The gallery round the principal room of the house, appropriated to the 'Grass Order.'

(To the left, immediately on entering from the stairs.) Various CASE kinds of RICE (*Oryza sativa*, L.), with and without the husk, 13. from India, East Indian islands, Europe, America, etc. This grain furnishes to the human race a larger proportion of food than any other single species. In India, where it is found wild, its cultivation is of the highest antiquity. It is said to have been introduced into China about 4680 years ago. At the present time it is grown in nearly all hot countries, extending to Southern Europe, and into several of the Southern States of America, especially the Carolinas, where some of the finest rice is produced. Of Rice (not in the husk), 4,077,584 cwts. were imported in 1870 into the United Kingdom.

No. 29. Numerous varieties of RICE grown in India, in the husk called 'Paddy.' The Rice of Patna and Arracan commands a large sale in the London market. Note also samples from other rice-growing countries.

No. 30. STARCHES manufactured in England from Rice.

Matting, baskets, etc., made of 'Esparto Grass' (*Lygeum spar- CASE tum*, L.), and perhaps another species, growing in Spain, Italy, 14. North Africa, etc. Used in the time of the Romans for coarse cordage, and now extensively employed for paper-making.

Chiefly devoted to INDIAN CORN, or MAIZE (*Zea Mays*, L.). CASE Native originally of America, of which part is doubtful. Early 15. introduced into the Old World after the discovery of the former, and now a most important culture in the East Indian islands and North Africa. It is grown also in South Europe. 16,769,207 cwts. were entered for home consumption in 1870.

Numerous varieties are exhibited. Remark—

HAT made of 'HUSK,' the sheathing-leaves of Maize.

No. 31. 'CORNBALL,' made of 'popped' grains of Indian Corn, prepared by heating them on a metal plate. The grains open, exposing their starchy, white contents. They are sweetened and coloured.

No. 32. Monstrous growths of the flowering-spike of Maize.

No. 33. MAIZE from a Peruvian sepulchre.

In passing to Case 16, note a frame containing specimens of woods seasoned by Newton's patent desiccating process.

Case 16 contains chiefly agricultural grasses.

Observe—

No. 34. JOB'S TEARS (*Coix Lacryma*, L.). The seeds, sur- CASE

16.

CASE rounded by a hard-shelled involucrem, strung upon thread, and sold in Paris for rosaries, at a sou apiece.

16. **NO. 35. CANARY-SEED** (*Phalaris canariensis*, L.). Mainly used to feed caged birds. The annual consumption may be estimated at about 10,000 quarters, of which about 8000 are grown in England, especially in the Isle of Thanet and Essex. The principal sale is in the manufacturing districts of Lancashire and Yorkshire.

CASE **NO. 36. MILLET** (*Panicum miliaceum*, L., *P. italicum*, L., etc.). Cultivated from a very remote period, in India and China. Millets were also grown by the Celts and Germans. The species are ill-understood, and scarcely to be identified.

NO. 37. INDIAN MILLET (*Setaria*, spp.).

NO. 38. GERO (*Penicillaria spicata*, Willd.). A grain in daily household use on the Niger and Gambia. This specimen shows the mode in which the 'spikes' are secured for transport.

CASE **NO. 39. COMMON REED** (*Phragmites communis*, Trin.).

18. **NO. 40.** Portion of ceiling from a cottage in Somerset, of reeds and plaster.

Observe specimens of Maram-grass (*Psamma arenaria*, Beauv.); a very valuable sand-binding plant.

NO. 41. PROVENCE REED (*A. Donax*, L.). From the South of Europe. The root is used medicinally in France.

CASE **NO. 42. Flowering-spike of PAMPAS GRASS** (*Gynerium argenteum*, Nees). A tall South American grass, cultivated for ornamental out-of-doors in Britain. The flower-stems serve for the shafts of arrows.

CASE **20.** Agricultural varieties of the Oat (*Avena sativa*, L.). The precise native country cannot now be determined, though probably it is of European or West Asiatic origin. It would appear to have been cultivated by the German races, but not by the Hebrews, Egyptians, Greeks, or Romans.

CASE Continued in Case 21. Note 'Oat-cake' and Norwegian 21. 'Flad-bróð,' the latter usually made of Barley-meal, or Barley and Oatmeal mixed. Baked in thin circles over a wood fire.

CASE Cases 22 to 24. Chiefly labelled agricultural grasses and seeds, 22,23, including Fescues (*Festuca*), and Meadow-grasses (*Poa*). Note 24. the stems of the 'Crested Dog's-tail' (*Cynosurus cristatus*, L.), prepared for plaiting, dyed, etc. Also hat, etc., of same. It is a common wild British species.

CASE Case 25. Principally agricultural varieties of WHEAT (*Triticum vulgare*, DC.). Its culture is coeval with the history of agriculture itself. Various passages in the sacred writings mention it. It is said to have been found wild in Asia Minor, but doubt must always attach to the place of its original nativity.

Observe—

No. 43. PAPER made of the creeping stems of COUCH-GRASS CASE
(*Triticum repens*, L.), a most troublesome agricultural weed. 25.

No. 44. Copy of an etching, executed with SMUT of Wheat,
a minute parasitical fungus (*Uredo*) having microscopic black
spores. Most frequent on Barley and Oats.

Specimens of WHEAT (continued) and RYE (*Secale cereale*, L.). CASE

No. 45. Various sorts of MACCARONI and VERMICELLI. Ma-26,27,
nufactured from fine Wheat-flour in Italy and Sicily. From Prof. 28.
Parlatore.

No. 46. PAPERS manufactured from STRAW.

No. 47. OILS extracted from WHEAT, used in flavouring con-
fectionery, etc.

No. 48. Flour buried in Kotzebue's Sound, by Captain Bee-
chey, in 1824; quite good when dug up in 1849, by Captain
Kellett.

Specimens of Straw Veneering from Japan, and of STRAW-CASE
PLAIT from North Italy, Dunstable, St. Alban's, etc., with instru- 29.
ment used in splitting straws. Also plait of Rye-straw.

Varieties of BARLEY (*Hordeum vulgare*, L.). One of the cul- CASE
tivated plants of Egypt and Palestine. Torrefied grains of Bar- 30,31.
ley are stated to have been found in the Egyptian catacombs,
though possibly of another species of *Hordeum*.

BARLEY (continued). Observe a series illustrative of the pro- CASE
gress of MALTING. The Barley, after having been made to ger- 32.
minate by warmth and moisture, is dried and its vitality destroyed.
Its infusion is fermentable, and contains saccharine matter.

Charred Barley, used to colour porter.

On an upper shelf are,—

No. 49. SCOTCH or POT BARLEY, the grain deprived of the
husk by a mill; and

No. 50. PEARL BARLEY, the seeds rounded and all the outer
coat removed.

LEMONGRASS (*Andropogon citratus*, DC., and allied species), CASE
furnishing fragrant essential oils, imported from India and Ceylon, 33.
as 'Lemon Grass' and 'Citronelle' oils. [Specimens of Grass
Essential Oils, accompanied by good examples, in flower, of the
Grass affording them, are requested.]

Note also varieties of *Sorghum*, affording in the West of Africa
and South of Europe, a useful MILLET.

The species are imperfectly understood. *S. vulgare*, Pers., *S.*
saccharatum, Mönch, and the Millet-yielding species, being
perhaps varieties of *S. halepense*, Pers., a species abundant in a
wild state in South Europe, North Africa, etc.

CASE 34. Produce of the SUGAR-CANE (*Saccharum officinarum*, L., also *S. violaceum*, Tuss., and *S. sinense*, Rxb.), originally native of Southern Asia, though never met with wild. Cultivated chiefly in India, East and West Indian Islands, and Mauritius, for the supply of our market, though extensively grown also in South America and China.

No. 51. SUGAR-CANE. The solid, jointed stems grow to a height of from six to twelve or even fifteen feet, bearing a large panicle of soft hairy flowers.

No. 52. Samples of Crystallized Sugars of commerce, obtained from the clarified juice by evaporation. The uncrystallized remainder is drained off as 'Molasses.'

The great proportion of Sugar in common use is refined in the United Kingdom; the raw impure Sugar being re-dissolved, heated with bullocks' blood, and filtered through animal charcoal.

Upwards of 12,200,000 cwts. of unrefined Sugar were imported into the United Kingdom in 1870.

No. 53. MEGASS, the cane after passing through the rollers of the sugar-mill for the expression of the juice. It is used as fuel.

No. 54. Samples of CANE JUICE in various stages of preparation, purified by the action of heat and lime.

No. 55. SLAG from furnaces in which the waste cane is burnt. The rind of the cane contains much silica, hence the glassy slag.

No. 56. PAPER made of refuse SUGAR-CANE.

CASE 35. Miscellaneous articles, chiefly made of the stems, roots, etc., of various grasses,—as brushes, whisks, table-mats, necklaces.

ROOM No. IV.

(Entered from the Gallery, between Cases 19 and 20.)

CASE 36,37. Contains various cloths, barks, cordage, and woods, afforded by species which cannot be identified.

ROOM No. V.

CASE 38. **Lily Order** (*Liliaceæ*). A large and beautiful Order, embracing several groups very dissimilar in habit and geographical distribution. Familiar examples are our garden Lilies, Aloes, Asparagus and Onion.

No. 57. 'BOWSTRING HEMP,' fibre afforded by the leaves of *Sansevieria zeylanica*, Willd., an Indian plant. It is extremely tenacious and well adapted for cordage.

No. 58. SOCOTRINE ALOES (*Aloë socotrina*, Lam.).

No. 59. BARBADOES ALOES (*A. vulgaris*, Lam.).

No. 60. CAPE ALOES (*A. spicata*, Thb., and allies).

The inspissated juice flowing from the fresh-cut leaves of these species of *Aloe*, constitutes the finest commercial ALOES. Inferior sorts are obtained by pressure or boiling the leaves. Barbadoes Aloe is imported from the West Indies in gourds. CASE 38.

No. 61. SQUILL, the bulb of *Scilla maritima*, L., growing on the shores of the Mediterranean.

No. 62. DRAGON'S BLOOD. The concrete resinous juice of *Dracæna Draco*, L., a tree of the Canaries. [This is not the Dragon's Blood of commerce, which is obtained from species of *Dæmonorops*, of the 'Palm Order.' Case 87.]

NEW ZEALAND FLAX, obtained from the leaves of *Phormium tenax*, Forst., and probably an allied species, natives of New Zealand and Norfolk Island. Specimens of the fibre, with cordage, baskets, garments, etc., manufactured of it. Continued in the next Case. CASE 39.

On the lower shelf.

No. 63. GRASS-WRACK (*Zostera marina*, L.), belonging to a small group of grass-like marine plants. It is common on the British coast and in most parts of the world, near low-water mark. Used for packing and to stuff beds. CASE 40.

Screw-Pine Order (*Pandanaceæ*). A small group of Palm-like trees and shrubs, growing mainly in the Indian islands. Remarkable for their branching candelabrum-like stems, and the roots given off from the trunk far above the surface of the ground. CASE 41.

No. 64. Strips of the leaves of *Carludovica palmata*, R.P., growing in New Granada.

No. 65. PANAMA HAT of the same material.

Note matting made from the leaves of species of Screw-Pine (*Pandanus*) and *Freycinetia*.

The 'Mats' in which Mauritius Sugar is imported, are made of the leaves of *P. utilis*, Borr.

FRUITS of SCREW-PINES, portions of stems, etc., with the supporting 'adventitious' roots. CASE 42.

Rush Order (*Juncaceæ*). Represented by the Rush of our commons and fens. CASE 43.

Note brooms and matting of the halms of common British species of Rush (*Juncus glaucus*, Ehr., and *J. communis*, Mey.).

No. 66. PITH of SOFT RUSH (*J. communis*, Mey.), as brought to market in Norwich. Used as wick in 'rush-lights.'

Observe also, Hat, baskets, etc., made of the fibrous leaves of the PALMITE (*Prionium Palmita*, E.M.), from South Africa.

Bulrush Order (*Typhaceæ*). A group of marsh plants, with long narrow leaves, and spiked or clustered flowers. CASE 44, 46.

No. 67. Cakes made of the pollen of *Typha elephantina*, Rxb. India.

CASE No. 68. Same, of the pollen of *T. angustifolia*, L., eaten in 44,46. Scinde.

Under the 'Arum Order' (*Araceæ*), represented in Britain by the 'Cuckoo-pint,'—

No. 69. SWEET FLAG (*Acorus Calamus*, L.), a widely distributed marsh plant, growing in Europe, Asia, and America. The creeping root (rhizome) is warm and aromatic.

No. 70. PORTLAND SAGO. Starch washed from the tubers of the Cuckoo-pint (*Arum maculatum*, L.) in Portland Island. Used as Arrow-root.

No. 71. COCO-MEAL and biscuits, prepared from the starchy tubers of *Colocasia esculenta*, Scht., in the West Indies.

CASE 47. **Sedge Order** (*Cyperaceæ*). A large tribe of grass-like plants, with solid though slender stems, and the sheaths of the leaves not split in front as in grasses. Growing in every country; some of the species are widely distributed.

Observe hassocks, mats, brushes, etc., made of the wiry stems and leaves of species of SEDGE (*Carex*).

No. 72. PAPYRUS documents from Egyptian tombs; the cellular pith of a species of Papyrus now extinct, or nearly so, in Egypt.

No. 73. PAPYRUS from the stem of *Papyrus antiquorum*, Willd. (*Cyperus syriacus*, Parl.), growing in Sicily and Palestine.

CASE 48. MARSH GLADDEN (*Scirpus lacustris*, L.), common in Britain, and generally in the north temperate zone, in watery places.

Case 45 contains a COAT of the same, from Portugal.

In the Table-Cases are contained miscellaneous specimens of Fibres, Oils, Fruits, etc., which cannot be referred with certainty to their respective Orders. The closed drawers in this Room, also in rooms No. I., VI., and VIII. contain fruits and seeds scientifically arranged for reference.

GROUND FLOOR.

ROOM NO. VI.

The Palm Order (*Palmaceæ*).

Palms are almost exclusively tropical, few species extending into cool countries. But one (*Chamærops humilis*, L.) reaches the South of Spain and Italy. They furnish the daily food, habitations, and utensils, of a large proportion of the human race. The Order is well represented by the trees cultivated in the Palm-stove of the Royal Gardens, where many of the more important species may be found.

Case 49 contains spadices, fruits, and articles made from the CASE leaves of *Astrocaryum* spp. 49.

The Wall-Cases (50-60) are devoted to sections of the wood, flower-branches, and sheaths (*spadices* and *spathes*) and leaves of Palms; with baskets, hats, etc., made of the leaves of undetermined species.

Observe in Case 50—

JURUPARIS, a sort of trumpet used on certain festal occasions CASE by the Indians of the Rio Negro. Made of the stem of the 50.
PAXIUBA PALM (*Iriarteia exorrhiza*, Mt.).

Ornamented leaf of PALMYRA PALM (*Borassus flabelliformis*, CASE L.). 56.

Contain chiefly sections of the stem of *Borassus*, exhibiting CASE the independent, isolated woody bundles, characteristic of the 57-60 stems of Monocotyledons.

The Table-Case contains Varnishes, 'Tar,' Paraffine, etc., manufactured from Peat and Coal; preparations of Irish Peat, compressed and fibrous; Lignite; a few fossilized stems, etc.

Room No. VII.

In Case 61 note the enormous fruit-branch of *Raphia Ruffia*, CASE Mart., from Mauritius. 61,62.

No. 74. Great-coat of the leaves of *Chamærops excelsa*, Thb.

No. 75. Another made of the fibre of the same: both from China.

No. 76. TENT-COVER, 23 feet by 6, of the leaves of the FAN CASE or TALIPOT PALM (*Corypha umbraculifera*, L.) used in Ceylon; 63.
light, strong, and waterproof. The dried leaves commonly serve as umbrellas.

Cases 64 and 65 contain shields, etc., made of Palm leaves. CASE

In glazed case on the floor, observe a specimen of the BAL- 64-5.
SAM-BOG, of the Falklands (*Bolax glebaria*, Com.), [Museum No. I., see Case 45;]—

Large Australian members of the Lily Order.

Species of GRASS-GUM-TREE (*Xanthorrhœa*). CASE 66-7.

Room No. VIII.

The Wall-Cases are occupied by specimens and products of the 'Palm Order.'

COCOA-NUT PALM (*Cocos nucifera*, L.). Cultivated abundantly on the coast of tropical countries, seldom penetrating 68-70.
far inland. Believed to have spread originally from the west coast of Central America and adjacent islands. One of the most invaluable species of the Order.

No. 77. Fruit, dry and in fluid, of the COCOA-NUT.

No. 78. HUSK of COCOA-NUT, consisting of strong wiry fibre, the 'Coir' of commerce.

No. 79. Brushes, Mats, Cordage, etc., of COIR-FIBRE.

No. 80. Ornamental articles and utensils of carved COCOA-NUT SHELL.

No. 81. ARRACK, distilled from the juice, or 'toddy,' obtained from incisions in the flowering branch, with vinegar prepared from it.

No. 82. OIL, also STEARINE and OLEINE, of the COCOA-NUT. Used in the manufacture of soap and candles. The oil is procured from the kernel by boiling or steaming, and pressure. One quart is said to be afforded by seven or eight nuts. 198,602 cwts. were imported in 1870.

No. 83. Model in wax, showing the GERMINATION of the COCOA PALM. The minute embryo occupies a small cavity in the firm, white albumen, or kernel, of the nut.

No. 84. Section of the STEM of COCOA-NUT PALM, furnishing *Porcupine-wood*.

CASE OIL-PALM (*Elais guineensis*, L.) of Western Africa.

71. No. 85. Fruit-clusters of *Elais*, from which 'Palm-Oil' is obtained by boiling in water. Specimens of 'Palm-Oil,' and its important manufactured products are exhibited. 868,270 cwts. of 'Palm-Oil' were imported in 1870. A selection of beads used in exchange for the oil with the natives of South and West Africa is exhibited on the bottom shelf.

CASE Leaves and plaited-work of the CARNAUBA PALM of Brazil

72. (*Copernicia cerifera*, Mt.).

No. 86. WAX obtained from the surface of the young leaves.

No. 87. Stems of *Copernicia*, showing the spirally-arranged leaf-scars. From the inside of the trunk the Brazilians prepare a '*farinha*.'

CASE SEYCHELLE PALM (*Lodoicea Seychellarum*, Lab.). Remarkable from the form of its fruit. The 'Double Cocoa-Nuts,' which prior to the discovery of the Seychelles (near Madagascar) were occasionally found floating in the Indian Ocean, from the mystery attached to their origin were highly prized, and enormous sums were paid for them.

No. 88. Section of 'DOUBLE COCOA-NUT,' and

No. 89. Germinating fruit of same.

CASE Case 74, occupied chiefly by apparatus employed in collecting

74. the vinous sap of the PALMYRA PALM (*Borassus flabelliformis*, L.); when fermented, called 'Toddy.' It is boiled down, to a large extent, for 'Jaggery,' or Palm-Sugar.

Note Hindoo and Cingalese BOOKS, made of strips of leaves of the 'Palmyra' (*Borassus*) Palm, with style used to mark the characters.

No. 90. Cap and Belt of very fine plait of the split leaves of CASE
the Australian Cabbage Palm (*Corypha australis*, R. Br.) 75.
Plaited-work of the leaves of a *Chamærops?* from Cuba, etc. CASE
Matting and plait of the leaves of the South European FAN- 76.
PALM (*Chamærops humilis*, L.), growing near the Mediterranean CASE
shores. 77,78.

DATE-PALM (*Phoenix dactylifera*, L.). Invaluable to the desert tribes of Northern Africa and the Sahara, whose most important wants it supplies. The fruit is the common food of themselves and their cattle, while their huts and houses are chiefly constructed of Date-wood.

The culture of the Date is of great antiquity. It was emblematic of the Jewish nation. Jericho was the City of Palm-trees. Date-Palms introduced into Southern Europe, seldom or imperfectly mature their fruit. The leaves are employed in festivals of the Romish Church.

No. 91. Baskets made of the leaves and leaf-stalks of the DATE-PALM.

No. 92. DATES and DATE CAKE, as sold at the Monastery, Mount Sinai, to travellers.

Plaited-work of the leaves of *Phoenix*, chiefly from central Africa. CASE
VEGETABLE-IVORY PALM (*Phytelephas macrocarpa*, R. & P.), 79.
of Central America and New Granada. CASE

No. 93. Showing the attachment of the fruits to the prostrate stem. 80.

No. 94. Entire matured fruits.

No. 95. IVORY-NUTS, laid open.

No. 96. Model of Temple, Chess-men, and ornaments, of VEGETABLE IVORY.

Observe the huge sheaths (spathes) which enclose the flower- CASE
ing branches of *Maximiliana regia*, Mt., a Brazilian Palm; used 81.
by the Indians as baskets.

No. 97. Forked stem of the DOUM PALM (*Hyphæne thæbaïca*, CASE
Mt.), of Egypt. Exceptional in the Palm Order from its branch- 82.
ing trunk.

No. 98. Fruits of *Hyphæne*. The thick rind in colour and taste resembles Gingerbread, hence a common name of this Palm, 'Gingerbread-tree.'

No. 99. Skin of Great Ant-eater; and Hide Bag, containing *Paraguay Tea*, too large for the proper Cabinet (Museum No. I., Case 53).

No. 100. Prickly roots thrown out from the stem above the CASE
surface of the ground, by the 'Zanona Palm' (*Socratea*, sp.), 83.
in Panama; used to grate the pulp of the Cocoa-Nut.

No. 101. BETEL NUTS, the fruit of *Areca Catechu*, Willd. In the Indian islands and China used in enormous quantities to chew with lime and the leaves of species of Pepper. The Nuts are astringent, and a decoction is used in dyeing.

CASE WINE PALM (*Caryota urens*, L.), affording, in India, 'Toddy'
84. and Sugar. [See plant under dome of Palm-stove.]

CASE No. 102. Hammock made of thread obtained from the young
85. leaves of the TUCUM PALM (*Astrocaryum vulgare*, Mt.), in Brazil. Ornamented with feathers.

No. 103. Hammocks of *Mauritia* thread, Brazil.

CASE No. 104. WAX obtained by scraping the trunk of the Wax-
86. Palm of the Andes (*Ceroxylon andicola*, H. B.). One tree is said to afford about 25 lbs. It is used with tallow in making candles.

Observe over fireplace Case containing specimens of machine wood carving.

CASE SAGO PALMS (*Sagus Rumphii*, Willd., *S. laevis*, Rph., etc.).
87. Sago is obtained from the cellular central portion of the trunk, the tree being felled, cut into lengths, and split. Ordinary sago is the starch thus procured, mixed with water and granulated. It is finally prepared at Singapore and Malacca.

No. 105. DRAGON'S BLOOD, a resin obtained from the fruits of *Dæmonorops Draco*, Bl., and allied species. Chiefly employed to colour varnishes, etc. [Specimens, in fruit and leaf, of resin-producing Palms are much wanted, along with the product.]

No. 106. SAGO CAKES, a staple article of food in the Moluccas. Sold at about 10s. per thousand.

The remainder of this Case contains cloth of twisted thread made from the leaves of the RUFFIA PALM (*Raphia Ruffia*, Mt.), by the Malagasy. Garments in common use in Madagascar are of this cloth.

CASE Note the beautifully imbricated scales of the fruits of *Raphia* sp.
88. 'CANES' and 'RATTANS,' the long flexible stems of species of
CASE *Calamus*, imported for caning chairs, broom-making, etc.

CASE No. 107. COQUILLA NUTS, the fruit of the PIASSABA PALM
89. (*Attalea funifera*, Mt.), of Brazil, Venezuela, etc. Used in
CASE turnery-work. They are very hard, and take a high polish.

90. No. 108. PIASSABA FIBRE, from the leaf-stalks of *Attalea funifera*, Mt., and *Leopoldinia Piassaba*, Wallace. Used for cordage, street-brooms, etc.

ACOTYLEDONS.

The Table-Cases are devoted to CRYPTOGRAMS, OR ACOTYLEDONS, plants which do not bear manifest flowers, nor produce seeds containing an embryo, as do the great Classes of DICOTYLEDONS and MONOCOTYLEDONS.

Acotyledons furnish comparatively few economic products; further investigation very probably may increase the number of these. The name of the Order represented in each Case is shown on a label attached under the glass.

Fern Order (*Filices*). Chiefly specimens of Trunks of Tree-Ferns, and sections showing their internal structure. But very few species are applied to economic uses. From the rhizomes of some species, as the common Brake (*Pteris aquilina*, L.), a farinaceous food is obtained in times of scarcity. One or two species (the Male Shield-Fern, etc.) are employed in medicine as anthelmintics.

Under the allied 'HORSE-TAIL' and 'CLUB-MOSS' Orders, observe—

No. 109. DOOR-mats of CLUB-MOSS (*Lycopodium*), from Sweden.

No. 110. DUTCH RUSHES (*Equisetum hyemale*, L.), used for scouring and polishing. Their roughness is due to a deposit of siliceous particles in the epidermis.

Under the 'Moss Order,' note,—

No. 111. BOG-MOSS (*Sphagnum*), excellently adapted to pack living plants in for carriage, from its retention of water, like a sponge. Used in Lapland to swathe children. It contributes largely to the formation of peat.

No. 112. HASSOCKS, made in the North of England, of the Hair-Moss (*Polytrichum*), with basket and broom of the same.

Lichen Order (*Lichenes*).

No. 113. Specimens of ORCHIL, CUDBEAR, and LITMUS, prepared from species of *Roccella*, *Lecanora*, etc., used to dye shades of purple-red, or 'mauve.' These dyes may be obtained from the same species by different modes of treatment. Litmus is valuable as a test for the presence of acids, which change its purple to a red.

No. 114. LICHEN-BREAD, used in Finland in time of scarcity.

No. 115. ICELAND MOSS (*Cetraria islandica*, Ach.). Chemically allied to Starch. It swells in water; and, when boiled, gelatinizes on cooling. Used by invalids.

No. 116. REINDEER-MOSS (*Cladonia rangiferina*, Hoff.), the winter food of that animal.

Mushroom Order (*Fungi*), of which the *Mushroom*, *Puff-ball*, and 'Mould' are examples.

Observe a large collection of Bornean *Fungi*, chiefly allied to *Polyporus*; from Sir James Brooke. Also specimens of 'Amadou,' or German tinder, prepared from *Polyporus fomentarius*, Fr., parasitical on the Oak, Birch, etc., and *P. igniarius*, Fr., growing on the Willow, Plum, etc.

'Amadou' is prepared by beating thin slices of the fungus, and soaking them in solution of Nitre. 'Black Amadou' is impregnated with gunpowder.

NO. 117. MORELLS (*Morchella esculenta*, L.), used in ragoûts and other dishes.

NO. 118. TRUFFLES (*Tuber cibarium*, Sibth.), found, by the aid of dogs, a few inches below the surface of the ground in various parts of England, and on the Continent. The London supply is chiefly from Kent, Wilts, and Hants.

NO. 119. NATIVE BREAD OF AUSTRALIA (*Mylytta australis*, Berk.), used by the Aborigines.

NO. 120. Wood stained green by *Periza æruginosa*, Fr., used in Tunbridge-ware and fancy work.

Seaweed Odrer (*Algæ*). Including also very numerous species from fresh water and moist surfaces. Some exhibit an extreme simplicity of structure, consisting of single microscopic cells, as the RED SNOWS (*Palmella nivalis* and others), which in Arctic and Alpine countries sometimes appear in quantity. The substance of several marine species is chemically similar to Starch, and, like it, swells in boiling water.

The 'Lavers' (*Porphyra*, *Ulva*, *Plocaria*, and others), are esculent.

NO. 121. 'LAMINARIAN HORN,' prepared from *Laminaria buccinalis*, Ag., of the Cape of Good Hope.

NO. 122. *Durvillæa utilis*, Bory, a gigantic seaweed of the Southern Ocean. Said to be used in Chili for food, made into soup, etc.

NO. 123. Portion of stem, etc., of *Macrocystis pyrifera*, Agh., an enormous seaweed, abounding in the Antarctic Ocean, between the parallels of 40° and 64°. Specimens from 100 to 200 feet in length are common: they sometimes occur from 500 to perhaps 1000 feet.

NO. 124. IRISH MOSS, or CARRAGEEN (*Chondrus crispus*, Lngb., and *C. mammillosus*, Grev.), imported from the West of Ireland for cattle-feeding and dietetic purposes.

NO. 125. GULF-WEED (*Sargassum bacciferum*, Agh.), found in enormous quantity, floating in an eddy of the Atlantic, to the west of the Azores, from 20° to 36° north latitude, and again west of the Bahamas.

No. 126. KELP, the ash of the common SEA-WRACK (*Fucus vesiculosus*, L., with other species) burnt in the open air. Contains from 5 to 8.5 per cent. of Carbonate of Soda.

No. 127. IODINE, obtained from various species of *Fucus* (*F. vesiculosus*, L., *F. nodosus*, L., etc.).

Round the Gallery railing of this Room observe a single stem of a species of *Calamus*, an East Indian Palm, measuring 160 feet in length.

Room No. IX.

The passage leading to the east door, between Cases No. 91 and 93, contains stems of Tree-Ferns, natives of the islands of the Southern Hemisphere, India, etc., where, especially in New Zealand and Norfolk Island, they become a prominent feature in the landscape.

Room No. X.

Specimens of a miscellaneous character, woods, etc., which cannot be identified with their respective species, and other objects which do not admit of systematic classification, are here exhibited.

Cases 97, 102, 105-7, contain specimens of woods from Jamaica, Venezuela, Guiana, etc. Source unknown.

Sections of stems, showing the injury done to the wood by insects, bad pruning, etc. CASE 98,99.

Series illustrating the preparation of various perfumes. 100.

Nests of wasps, constructed by these insects, of masticated wood. CASE 103.

Specimens of Paper and materials used in Paper-making. (Samples of Paper made of the fibre of various species, are exhibited, in the classified collections, under the Natural Orders to which they belong.) CASE 104.

The Table-Cases contain, also, a very miscellaneous collection of objects, which cannot be referred to their proper places in the arranged series, also a small collection of fossil woods.

Over the fireplace is a case of specimens of the Silkworm of the *Ailanthus* (*Bombyx Cynthia*), of China; now introduced extensively into Western Europe and Algeria.

In the window-recesses observe the 'VINEGAR-PLANT,' floating upon syrup, in which it induces fermentation. It is a 'Mould,' the spawn (mycelium) of which forms a tough web. Note, also, a case of Lichens and Pine-wood, brought from the Arctic regions by exploring expeditions.

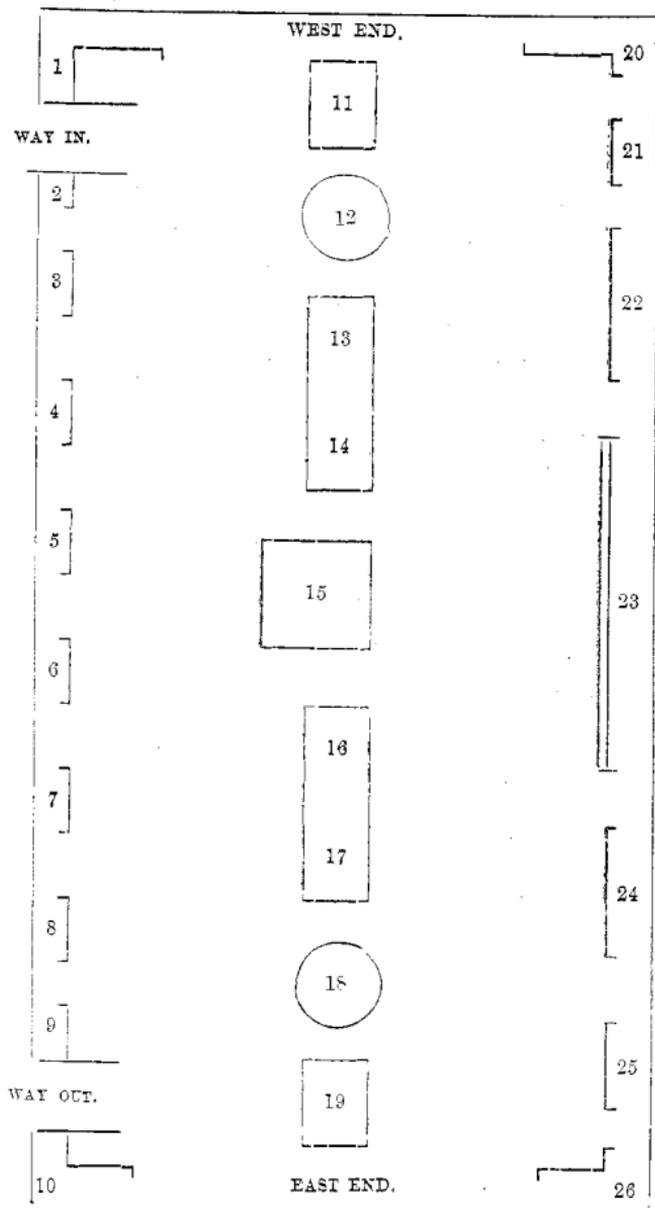
MUSEUM No. III.

This Museum is devoted chiefly to specimens of Colonial Timber, most of which were obtained from the Exhibition of 1862. The collection is arranged in groups according to the countries producing them, and not with any attempt at scientific classification, as in the other Museums. It must be borne in mind, however, that most of the specimens here exhibited are duplicates of those contained in the arranged collections, where they are necessarily small to suit the shelves of the Cabinets. Here, their full diameter is shown, and the magnitude of many of our Colonial trees becomes the more striking.

The old Orangery has been devoted to these collections, and the annexed Plan of the House will serve to direct visitors to the more important specimens which it contains.

1. Trinidad and British Guiana.
2. British Guiana.
3. Ditto, ditto.
4. Ditto, ditto.
5. Plank of Deodar (*Cedrus Deodara*) and tall stems of Tree Ferns.
6. Ditto, ditto.
7. Large slab of Camphor wood (*Camphora officinarum*, L.), and portion of a branch of Dragon Tree of Teneriffe.
8. Canada, etc.
9. Canada. Observe a fine slab of the White Pine (*Pinus Strobus*, L.)
10. Victoria.
11. East and West Indies and Algeria. Also a case of Vegetable Resinous Products, from Messrs. Wallis, Long Acre.
12. Bowl-like formation from the root of the Double Coconut (*Lodoicea Seychellarum*).
- 13 and 14. A relic of 'Herne's Oak,' blown down in Windsor Forest, August 31, 1863. Presented by Her Majesty the Queen. Also a Collection of Woods from Tuscany. A series of British-grown Woods. And an interesting series illustrating the manufacture of children's toys as carried on in Saxony. It will be seen that the rough design of the toy required is first turned in a circular piece of wood by the lathe; sections are then cut out and finished by hand.
15. Tasmanian Timber Trophy.
- 16 and 17. Ceylon, St. Helena, Guatemala, etc. Also a specimen of Bahamas Satin Wood.
18. Canada and British Columbia. Observe fine Sections of Canadian White Oak (*Quercus alba*, L.), and of the Douglas Fir

PLAN OF MUSEUM No. III.



(*Abies Douglasii*, Sab.), of British Columbia. Also a magnificent Section of the Common Oak (*Quercus Robur*, L.), grown in Denmark.

19. New South Wales and Victoria.
20. Queensland.
21. New Zealand.
22. Natal. Also *Welwitschia mirabilis*, Hook. fil.
23. Tasmania.
- 24, 25, 26. New South Wales.

On Table No. 11 is an instructive series of sections of the Cork Oak (*Quercus Suber*, L.), showing the growth of the bark (Cork) from one to fifteen years.

No. 12 is a Case containing a most peculiar formation from the root of the Double Cocoa-Nut (*Lodoicea Seychellarum*, Lab.). The actual root in a growing state is seated in this bowl or cup, and the rootlets pass into the earth through the holes seen inside this specimen.

On the Natal Sideboard (No. 22) is a glazed case containing specimens of the peculiar *Welwitschia mirabilis*, Hook. fil. This plant, which is closely allied to the Conifers or Pine Family, was discovered by Dr. Welwitsch in 1859, on an elevated sandy plateau in south-west tropical Africa. It grows in a hard stony soil, where little or no rain falls. It has but two leaves, which exist the whole life of the plant, which is said to be 100 years. These leaves lie flat upon the ground, and are about six feet long.

Between the Tasmanian and New South Wales Collections (Nos. 23 and 24), is the base, as well as a transverse section, of a curiously-formed trunk of a tree known in Ascension as "Lapacho." The wood is used for ship-building in the Arsenal of Ascension.

Between Buttresses 3 and 4 note large section of Cedar of Lebanon (*Cedrus Libani*, Loud.), from a tree grown in the Royal Gardens, Kew. The specimen measures 4 feet 5 inches in diameter, and was 113 years old.

Between 4 and 5 is a fine specimen of Scotch Fir (*Pinus sylvestris*, L.), from Rothiemurchus. Also some large specimens of Virgin Cork, introduced into this country for application in rustic garden work, etc. Note also, at Buttress No. 5 of Plan, some very fine stems of Bamboo adapted for fishing-rods, etc.

Between 6 and 7 observe a model, in wax, of the *Rafflesia Arnoldi*, R. Br., a gigantic parasite upon the stems of some of the Vine Order, growing in Sumatra. The flower measures from 3 feet to 3 feet 6 inches across. The plant is destitute of stem and

leaves. Models of early stages of the flower are also exhibited. [See Rhizanth Order, Museum No. I., Case 101.]

Between 7 and 8 is a specimen of the trunk of a Bunya Bunya (*Araucaria Bidwillii*, Hk.), from Queensland; and close to this is a branch of the celebrated Dragon-tree of Orotava (*Dracæna Draco*, L.), destroyed by a gale in 1867.

Between 17 and 18 is a group of Grass Gum-trees (*Xanthorrhœa*, spp.) and *Kingia australis*, R. Br.—Plants of Australia, which, though bearing some outward resemblance to each other, belong respectively to the Lily and the Rush families.

INDEX.

	PAGE		PAGE		PAGE
Abelmoschus esculentus	8	Andropogon, spp.	67	Balsam of Peru and Tolu	23
Abies balsamea and A. Picea	58, 59	Anonaceæ	5	Balsam-bog	32, 71
Abies excelsa	57	Anthem. nobilis	35	Bamboos	64
Abrus precatorius	22	Antiaris toxicaria	51	Bananas	63
Acacia Catechu, and A. Niopo	25	Apocynaceæ	39	Banyan	52
Acanthaceæ	44	Apple	26	Baobab	9
Aceraceæ	14	Aquifoliaceæ	37	Baphia nitida	24
Acer campestre	14	Aquilaria Agallocha	47	Barberry Order	6
Acer Pseudo-platanus	14	Araceæ	70	Barley	67
Acer saccharinum	14	Arachis hypogæa	22	Barosma, spp.	18
Acmena	29	Aralia nudicaulis	32	Barringtonia Order	29
Aconitum	5	Aralia papyrifera	32	Bassia butyracea	38
Acorus Calamus	70	Araliaceæ	32	Bassia Parkii	37
Acotyledons	75	Araucaria, spp.	57	Bast	8, 10
Adansonia digitata	9	Areca Catechu	74	Batatas edulis	41
Ægle Marmelos	11	Arenaria musciformis	8	Bauhinia	24
Æschynomæ aspera	22	Argan Oil	38	Bedellium	20
Æsculus Hippocastanum	13	Argania Sideroxylin	38	Beans, sacred	6
African Rosewood	23	Aristolochia	48	Bedeguars	25
African Teak	48	Arnatto	7	Bedfordia salicina	36
Agave americana	64	Arrack	72	Beech and oil of	55
Allanthus silkworm	77	Arrowroot Order	62	Beefwood Order	55
Akee	13	Arrowroot, English	42	Beet and sugar of	44
Alangium Order	27	Artanthe elongata	53	Benzoil	36
Aleurites triloba	48	Artichokes, Jerusalem	35	Berberidaceæ	6
Algae	76	Artocarpæ	51	Bergamot	12
Alkanet-root	42	Artocarpus incisa	51	Bertholletia excelsa	29
Allspice	28	Artocarpus integrifolia	51	Beta vulgaris	44
Almonds	26	Arum maculatum	76	Berul-nuts	74
Aloe, spp.	68	Arundo Donax	66	Becula papyracea	55
Aloe, American	64	Asclepiadaceæ	30	Bhang	59
Aloes	68	Ash	38	Bignonia Chica	41
Amadou	76	Aspidosperma excelsum	40	Bignoniaceæ	41
Amaryllis Order	63	Asafoetida	31	Bisk or Bish	5
Amni Visnaga	31	Astragalus	21	Bindweed Order	41
Ammoniacum, Gum	31	Astrocaryum vulgare	74	Birch-bark	55
Amomum Melegueta	62	Atherosperma moschata	46	Bird-lims	37
Ampelidæ	15	Atropa Belladonna	42	Birchwort Order	48
Amygdalus communis	26	Attalea funifera	74	Bitter-wood	18
Amyridaceæ	20	Aurantiaceæ	11	Blax Orehana	8
Anacardiaceæ	19	Avena sativa	66	Blighia sapida	13
Anacardium occidentale	20	Averrhoa Bilimbi	16	Blimbing	16
Anamirta Cocculus	5	Avocado Pear	43	Blue gum	28
Anastatica hierochontica	7	Bael	11	Bœhmeria nivea	50
Alkanna tinctoria	42	Balanophora, spp.	60	Bogbean	40
Andromachia igniaria	35	Balata	37	Bog-moss	75
		Balm of Gilead and Mecca	20	Bog Oak	54
				Boix glebaria	32, 71

	PAGE		PAGE		PAGE
Bombax Ceiba	10	Carludovica palmata	69	Clematis Vitalba	5
Boraginaceæ	42	Carnauba Palm	72	Clover-Seed	21
Borassus flabelliformis	71-73	Carob-pods	24	Cloves	28
Bordeaux Turpentine	58	Carragen Moss	76	Club-Moss Order	75
Boswellia	20	Carthamus tinctorius	35	Cocculus indicus	5
Boxwood	48	Carum Carui	32	Cochineal	31
Brake	75	Carya, spp.	56	Cocoa Order	13
Brassica oleracea	7	Caryocar, spp.	14	Cococa-Meal	70
Brayera anthelmintica	25	Caryophyllaceæ	8	Cococa	10
Brazil-nuts	29	Caryophyllus aromaticus	28	Cococa-Nut Palm	71
Bread (native), Australia	76	Caryota urens	74	Cocos nucifera	71
Bread-fruit Order	51	Cascarilla	33	Codilla of Flax	17
Bread (Lichens)	76	Cashew nut	30	Coffee	34
Bromeliaceæ	64	Cassava Meal	49	Coir	71
Broom	21	Cassia buds	40	Coix lacryma	65
Broom-rape	43	Cassia, spp.	23	Colletia cruciata	19
Broussonetia papyrifera	52	Cassia lignea and vera	46	Colecacia esculenta	70
Brya Ebenus	22	Castanea vesca	55	Colza Oil	7
Buchu	18	Castle soap	39	Combretaceæ	27
Buckthorn Order	18	Castilleja elastica	51	Compositæ	35
Buckwheat Order	45	Castor Oil	49	Coniferae	58
Bulrush Order	69	Casuarinaceæ	55	Conium maculatum	32
Bunya-bunya Pine	58	Catechu	25	Convolvulaceæ	41
Burgundy Pitch	59	Cavanillesia	8	Convulvulus Scammonia	41
Butea frondosa	52	Cayenne Pepper	42	Cookia punctata	11
Butter and Tallow-tree	12	Cedar (New S. Wales)	15	Copaiba	24
Butternut-wood	56	Cedar Pencil	59	Copaifera	24
Butter, vegetable	38	Cedar (West Indian)	15	Copal	23
Buxus sempervirens	48	Cedar-wood	15, 57	Copernicia cerifera	73
Byttneriaceæ	10	Cedrela australis	15	Coquilla Nuts	75
		Cedrela odorata	15	Cork-Oak	55, 80
Cabbage Walking-stick	7	Cedron	18	Coriander Order	33
Cactaceæ	30	Cedrus	58	Cornel Order	33
Cactus, Old Man	31	Celastraceæ	18	Corylaceæ	54
Caesalpinia Coriaria and Sappan	23	Cephaelis Ipecacuanha	33	Corypha umbraculifera	71
Caesalpinieæ	21, 23	Cerataonia Siliqua	24	Corypha australis	71
Caffer Tea	85	Cereals	64	Cotton	9
Calabash	30	Cereus, spp.	31	Cotton (Silk)	10
Calabash Order	41	Cerorylon andicola	74	Couroupita guianensis	29
Calamander Wood	87	Cetraria islandica	75	Cowdi Resin	58
Callitris quadrivalvis	59	Chamerops	71, 73	Cow Tree (of Pará)	38
Calluna vulgaris	36	Chamomiles	35	Crab Oil	14
Calotropis gigantea	39	Chavica Roxburghii	58	Crabs'-eyes	22
Calumba Root	5	Chaw-stick	19	Cranberry Order	35
Cambogia	12	Chebotestemon platanoides	9	Cranesbill Order	16
Camphor	46	Chebotodiaceæ	44	Cream of Tartar	16
Camphor (Sumatra)	10	Chestnut	55	Creosote Cujete	41
Camphora officinarum	46, 73	Chestnuts, Water	29	Crocus sativus	36
Cam-wood	24	Chickweed Order	8	Crotalaria juncea	21
Canada Balsam	59	Chicory	35	Croton Oil	49
Canary-seed	66	China-grass	50	Cruciferae	7
Canna edulis	63	China Root	61	Cryptogams	75
Cannabinaceæ	50	Chloroxylon Swietenia	14	Cuba Bast	8
Cannabis sativa	50	Chocolate	10	Cubeba officinalis	53
Candle-nut Oil	48	Chondrus, spp.	76	Cucumis, spp.	29
Candles (Balanophora)	60	Chrysoalanaceæ	26	Cucurbita maxima	30
Canes	74	Chrysophyllum Cainito	38	Cucurbitaceæ	29
Canon-ball tree	29	Churras	51	Cudbear	75
Caoutchouc	39, 49, 52	Cicer arietinum	22	Cumin	32
Capparidaceæ	7	Cichorium Intybus	35	Cunninghamia sinensis	59
Capsicum annuum	42	Cinchona	33	Cupressus sempervirens	59
Caraipe	26	Cinnamomum zeylanicum	46	Curare	40
Carapa, Oil of	14	Cinnamon	46	Curcuma angustifolia and longa	62
Caraways	32	Cistaceæ	8	Currants	15, 31
Cardamoms	62	Cistus creticus	8	Cuscuteæ	42
Carex	70	Citron, fingered	11	Custard-apple	5
Carica Papaya	30	Citrouelle Oil	67		
		Cladonia rangiferina	76		

	PAGE		PAGE		PAGE
Cutch	25	Eurybia argophylla	36	Gulf-weed	77
Cycadaceæ	59	Evening Primrose Order	29	Gum Ammoniacum	21
Cydonia vulgaris	26	Everlasting	35	Gum Arabic	24
Cynosurus cristatus	66	Excoquer tallies	33	Gum, British	42
Cyperaceæ	70	Exogonium Purga	42	Gum-trees	28
Cypress	59			Gunja	50
Cytharexylon	44			Gunny	10
		Fagus	55	Gutta-Percha	58
Daerydium Franklinii	56	Fennel Order	32	Guttiferæ	12
Dalbergia	22	Fern Order	73	Guttiferæ saccharoides	66
Dammara	58	Ferula galbaniflua	31		
Dandelion	36	Fescues	66		
Daphne papyracea	47	Ficoideæ	30	Hæmatoxylon Campechi-	
Date Palm	73	Ficus	52	anum	23
Datura Stramonium	43	Fiddle-wood	44	Hair-moss	75
Demonorops Draco	74	Fig-Marigold Order	30	Haloragæ	29
Dicotyledons	4	Fig Order	52	Hand-plant	9
Digitalis purpurea	43	Figwort Order	43	Harpulia pendula	14
Dioscoreaceæ	60	Filices	75	Hashish or Hachich	51
Diospyros Ebenum and		Flacourtiaceæ	7	Heathorn	26
quæsitâ	37	Flax, N. Zealand	16, 17	Hazel Order	54
Dipacææ	34	Flindersia Oxleyana	69	Heath Order	36
Dipterocarpeæ	10	Forbidden Fruit	14	Hedera Helix	32
Dipteryx odorata	23	Foxglove	11	Helianthus tuberosus	35
Divi-divi	22	Frankincense	43	Helichrysum nudifolium	35
Dock	45	Fraxinus, spp.	58	Hemidesmus indicus	39
Dodder Order	42	Frenela rhomboidea	38	Hemlock	32
Dogbane Order	39	Freyinetia	59	Hemlock Spruce	57
Dog's-tail grass	60	Frogbits	69	Hemp	50
Dogwood of Tasmania	36	Fucus, spp.	61	Hempbane	43
Dorema ammoniacum	31	Fungi	77	Henna	27
Double Cocoa-nut	72, 80	Fustic	76	Hermas gigantea	32
Douglas Pine	57, 78		52	Herne's Oak	54, 78
Doum Palm	73	Galbanum Gum	59	Hevea brasiliانا	49
Dracæna Draco	64, 69	Gall-nuts	31	Hickory Nuts	56
Dragon's Blood	64, 79	Gambier	54	Hog-gum	12
Dragon-tree	64, 79	Gamboe	34	Holly	37
Drupacææ	26	Garacine	12	Honeysuckle	33
Dryobalanops Camphora	10	Garcinia	34	Hops	51
Duguetia	5	Garcinia scoparia	12	Hordeum vulgare	67
Durian	9	Genista scoparia	21	Horse-chestnut	13
Durvillea utilis	6	Gentianææ	40	Horse-radish	5
Dutch Rushes	75	Geraniaceæ	16	Horse-tails	75
		Gero	66	Huon-Pine	40, 56
Eagle-wood	47	Gingeley Oil	41	Hura crepitans	49
Ebenaceæ	36	Ginger	62	Hymenaa Courbari	24
Ebony	36	Ginseng	32	Hyoscyamus niger	43
Ebony (West Indian)	22	Girardinia heterophylla	50	Hypericaceæ	12
Edgeworthia Gardneri	47	Glastonbury Thorn	26	Hyphæna thebaica	74
Elæagnaceæ	47	Glycerrhiza, spp.	21		
Elæagnus orientalis	47	Gnetum	21		
Elais guineensis	73	Gooseberry	56	Iceland Moss	75
Eleteria	62	Gossypium, spp.	31	Ilex Aquifolium	37
Elm Order	52	Gouania domingensis	8	Ilex paraguayensis	37
Elodea canadensis	61	Gourds	19	India-rubber	49
Encephalartos, spp.	59	Grains of Paradise	29	Indian Corn	56
Ensete	63	Gram	62	Indigo	21
Entada scandens	24	Graminææ	22	Insect-wax	38
Epacridaceæ	36	Grape-vine	64	Iodine	77
Episetum hymemale	75	Grapple-plant	15	Ipecacuanha	33
Ericaceæ	36	Grass-gum-tree	41	Iriartea exorrhiza	71
Eriobotrya	26	Grass-wrack	71, 81	Iris Order	63
Eryum Lens	22	Greenheart	69	Irish Moss	76
Erythroxylaceæ	13	Ground Nuts	45	Iron-bark trees	28
Esparto Grass	65	Guaco	22	Isatis tinctoria	7
Eucalyptus	28	Guaiacum officinale	48	Isonandra Gutta	38
Euonymus europæus	16	Guarana Bread	17	Ivy	32
Euphorbiaceæ	48	Guavas	13		
		Gullandina Bonduc	28		
			25	Jack fruit	51

INDEX.

85

	PAGE		PAGE		PAGE
Jaggery	73	Locust-tree (W. Indian)	24	Monkshood	5
Jalap	42	Lodoicea Seychellarum	72, 78	Monocotyledons	60
Jambosa vulgaris	29	Loganiaceae	40	Monsonia	16
Japan Pepper	18	Logwood	23	Mouquilea utilis	26
Japan Wax	20	Longans	13	Mora	24
Jasmine Order	38	Loquat	26	Morchella esculenta	76
Jateorhiza Calumba	5	Loranthaceae	33	Morrells	76
Jatropha	49	Lotos	19	Moronobaea coccinea	12
Job's Tears	65	Lotus, sacred	6	Morus, spp.	52
Joint Firs	56	Luffa aegyptiaca	29	Mosses	75
Juglandaceae	55	Lycopersium esculentum	42	Mould	76
Juglans	55	Lycopodium	75	Mucuna	22
Jujube	19	Lygeum spartum	65	Mulberries	52
Juncaceae	69	Lythraceae	27	Munjeet	34
Juniper Berries	59	Maccaroni	67	Muscaceae	63
Jute	10	Mace	46	Mushroom Order	76
Kamala Dye	48	Maclura tinctoria	52	Musk-root	32
Kauri Resin	58	Macrocytis pyrifera	76	Musk-root (Tasmania)	36
Kava-root	53	Madder	34	Mustard	7
Kelp	77	Magnolia Order	5	Mustard-tree	39
Kigelia, spp.	41	Mahogany	15	Myrica Order	53
Kingia australis	80	Maize	65	Myristicaceae	46
Kino	23	Mallow Order	8	Myrobalans	27
Kola Nuts	9	Malpighiaceae	13	Myrospermum Pereirae	23
Koussou	25	Malt	67	Myrrh	20
Labdanum	8	Malvaceae	8	Myrtaceae	27
Labiate	43	Mammee Apple	12	Myrtle (Tasmanian)	55
Lac	52	Mandiocca Meal	49	Myrtus Pimenta	28
Lace-bark Order	47	Mangifera indica	19	Napoleona Order	30
Lagenaria vulgaris	30	Mango	19	Nardostachys Jatamansi	34
Lagetta linearia	47	Mangold Wurzel	45	Narthex asafetida	31
Laminaria	76	Mangosteen	12	Nasturtium	16
Lancewood	5	Mangrove	27	Nectandra Rodiei	45
Landolphia florida	40	Manihot, spp.	49	Negro Peach	34
Lapacho	80	Manila Hemp	63	Nelumbiaceae	6
Larch	57	Manna	38	Nelumbium speciosum	6
Lauraceae	45	Mannite	36	Nepenthaceae	50
Lavender	43	Maoutia Puya	50	Neroli	12
Laver	76	Maple Order	14	Nettle	50
Lawsonia inermis	27	Marain Grass	66	Newton's process for de- siccating wood	65
Lecanora	75	Maranta arundinacea	62	New Zealand Flax	69
Lecythidaceae	29	Marantaceae	62	Nicotiana, spp.	43
Lecythis, spp.	29	Marjoram	44	Nightshade Order	42
Leguminosae	20	Marking Nuts	19	Niopé Snuff	24
Lemon Grass, and Oils of	67	Mastic	37	Norfolk Island Pine	53
Lentils	22	Maté	33	Norway Spruce	57
Leopard-wood	51	Matico	53	Nutmegs	46
Leopoldinia Piassaba	74	Marticaria Chamomilla	53	Nuts and Nut Order	54, 55
Lepurandra saccidora	51	Mauritia	73	Nux-vonica	40
Letter-wood	51	Maximiliana regia	73	Nymphaceae	6
Leucodendron argenteum	47	Medlar	26	Oak	54
Lichen-bread	75	Megass	68	Oat	66
Lichenes	74	Melaleuca, spp.	28	Ochro	8
Lign Aloes	47	Melastomaceae	27	Ochroma Lagopus	10
Lignum Vitæ	17	Meliaceae	14	Oil-cake (Cotton-seed)	8
Liliaceae	63	Menispermaceae	5	Oil-cake (Linseed)	16
Lime	10	Menyanthes trifoliata	40	Oil-Palm	72
Linaceae	16	Mesembryanthemum	30	Oils from Wheat	67
Linden	10	Mespilus	26	Oldfieldia africana	48
Linen-cloth	17	Mezereon	47	Olea europæa	39
Linseed	16	Milk-tree (of Pará)	38	Oleaceae	38
Linum usitatissimum	16	Milkwort Order	8	Oleaster Order	47
Liquidambar orientale	31	Millet	65, 67	Olibarum	20
Liquorice	21	Mimoseae	21, 24	Olive Order and Oil	38, 39
Litchis	13	Mistletoe	33		
Litmus	75	Monkey-pot	29		

	PAGE		PAGE		PAGE
Onagraceæ	2	Plassaba Palm	74	Rhododendron	36, 40
Opium	6	Plassaba Fibre	74	Rhubarb	45
Opuntia Ficus-indica	31	Pimento	28	Rhus	12, 20
Orach	44	Pine-apple	64	Rice	65
Orange	11	Pine Order	56	Rice-paper	32
Orchideæ	61	Pine-soap and wool	57	Ricinus communis	49
Orchil	75	Pinus palustris and P.		Rocella	75
Ordeal Beans	22	Pinaster	58	Rosaceæ	25
Orobanchaceæ	43	Piperaceæ	53	Rose-apples	29
Oryza sativa	65	Pistacia and nuts	19	Rose of Jericho	7
Osage Orange	52	Pita Fibre	64	Rosewood	22
Osleas	53	Pitch	58	Rosin	59
Otto of Rose	25	Pitcher-plant Order	57	Rottlera tinctoria	48
Oyster-bay Pine	59	Pittosporaceæ	10	Rubia	34
Oxalate of Lime	31	Plantains	63	Rubiaceæ	33
Oxalic Acid	16, 22	Plume Nutmegs	46	Rush	69
Oxalidæ	16	Podostemon Order	53	Rushes, Dutch	75
Oxandra virgata	5	Podostemon Patchouli	44	Rutaceæ	17
		Polygonaceæ	45	Rue	18
Paddle-wood	40	Polyporus, spp.	76	Rye	67
Paddy	65	Polytrichum	75		
Palm Oil	72	Pomaceæ	26	Saccharum, spp.	68
Palm Sugar	73	Pomegranates	28	Safflower	35
Palmaceæ	70	Poppy	72	Saffron	63
Palmella nivalis	76	Porcupine-wood	62	Sagapenum, Gum	32
Palmité	69	Portland Sago	70	Sage	43
Palmryra Palm	71, 72	Portulaca oleracea	30	Sago	74
Pampas Grass	66	Potato	42	Salicaceæ	53
Panama Hat	69	Pottery tree	26	Salvadora persica	39
Pandanaceæ	69	Pounce	59	Sandal-wood	48
Pangium Order	80	Primrose Order	44	Sandarach	59
Panicum, spp.	66	Prionium Palmitta	69	Sandbox-tree	48
Papaver somniferum	6	Proteaceæ	47	Sander's-wood, Red	22
Papaveraceæ	6	Provence Reed	65	Sansevieria zeylanica	68
Papaw	30	Prunus, spp.	26	Santalum album	48
Paper	67	Psamma arenaria	66	Sap-green	19
Papilionaceæ	21	Psidium, spp.	28	Sapindaceæ	13
Papyrus	70	Pteris aquilina	75	Sapodilla Order	37
Paraffine	71	Pterocarpus, spp.	23	Sapotaceæ	37
Paraguay Tea	37, 78	Puff ball	76	Sappan-wood	23
Paritium elatum	8	Pulque	64	Sapucata Nuts	29
Patchouli	44	Purslane	30	Sargassum baciferum	77
Paulinia sorbilis	13	Pyrethrum roseum	33	Sarraceniaceæ	6
Paxiuba Palm	71	Pyrus, spp.	26	Sarsaparilla Order	61
Pea	22			Sarsaparilla, Indian	39
Pear	26	Quassia Order	18	Sarsaparilla, Virginian	32
Pearl Barley	67	Quercitron	54	Sassafras	46
Peat	71	Quercus	54	Satin-wood	14
Pedaliaceæ	41	Quilla; Bark	25	Saxifragæ	31
Peepul	52	Quince	26	Scammony	41
Pentadesma butyracea	12	Quinine	33	Sciadopitys verticillata	58
Penicillaria spicata	66	Quinoa	44	Scilla maritima	69
Pennyroyal	43			Scirpus lacustris	70
Pepper	33	Rafflesia, spp.	60, 80	Scleroleima forsteroides	35
Pepper, Clove or Jamaica	28	Raisins	15	Scotch Fir	57
Pepper, Japan	18	Ranunculus Order	5	Screw-Pine	69
Peppermint	44	Raoulia eximia	33	Scrophulariaceæ	46
Persea gratissima	45	Raphia Ruffia	71, 74	Seaweed Order	73
Persian Berries	19	Ratans	74	Secale cereale	67
Peziza canariensis	33	Red Snow	73	Sedge Order	70
Phelixa æruginosa	76	Reed	66	Senna	23
Phalaris canariensis	66	Reindeer Moss	76	Sesamum indicum	41
Phoenix dactylifera	73	Revalenta	22	Seychelle Palm	72, 78
Phormium tenax	69	Rhamnaceæ	18	Shaddock	11
Phragmites communis	66	Rhea Fibre	50	Shea Butter	37
Phytolium dichotomum	62	Rhizantææ	60	Shepherdia argentea	47
Phytalephas macrocarpa	73	Rhizobolaceæ	14	Shoa	22
Phytolaccaceæ	44	Rhizophoraceæ	27	Silk-cotton	10

	PAGE		PAGE		PAGE
Silver-wood	47	Tanghin	39	Urticaceæ	50
Simarubaceæ	48	Tannin	54	Vacciniaceæ	36
Sinapis, spp.	7	Tapa Cloth	52	Valerianaceæ	34
Siphonia brasiliensis	49	Tapioca	49	Valonia	54
Smilacææ	61	Tar	56, 58, 71	Vanilla	61
Smut of Wheat	67	Taxaceæ	56	Vateria indica	24
Soap-berries	14	Tea	10, 11	Vegetable Butter	38
Socratea	73	Teak	44	Vegetable Ivory	73
Solanaceæ	42	Teak, African	46	Verbenaceæ	44
Sorghum, spp.	67	Teale Order	27	Vermicelli	67
Sorrel, Wood	16	Terminalia	34	Wine	15
Souari Nuts	14	Ternstroemiaceæ	10	Vinegar-plant	77
Soursop	5	Terra-japonica	23, 34	Violaceæ	8
Sphagnum	75	Thorn-apple	43	Walnut	56
Spikenard	34	Thrinax	73	Wampsee	11
Spinach	44	Thuja gigantea	59	Wasps' nests	77
Spindle-tree	18	Thunbergia	58	Water Lilly	6
Sponge Order	47	Thymelacææ	47	Wax, Insect	38
Squill	69	Tiliacææ	10	Wax Palm	73
Star-apple	38	Tobacco	43	Wellingtonia gigantea	59
Starch, Rice	65	Toddy	72, 73, 74	Welwitschia	56, 60
Sterculiaceæ	9	Tomatoes	42	Wheat	67, 79
Stillingia sebifera	48	Tonquin Beans	22	Willow	53
Storax, Liquid	31	Tous-les-Mois	63	Wine	15
Storax	35	Towel Gourds	29	Wine Palm	74
Straw	57	Tragacanth	21	Witch-Hazels	31
Stringy-bark trees	23	Trapa, spp.	29	Wood	7
Strychnos	40	Tree-Ferns	75	Wourali	40
Styrax Benzoin	36	Triticum	63	Xanthorrhœa	71, 81
Styrax officinale	36	Tropaeolacææ	16	Yams	60
Sugar, Cane	69	Truffles	76	Yellow-berries	19
Sugar, Beet	44	Taber cibarium	76	Yeracum Fibre	39
Sugar, Maple	14	Tacum Palm	74	Yew	56
Sugar, Palm	72	Talip-wood	14	Zanona Palm	73
Sumac	26	Tanbridge Ware	40	Zanthoxylacææ	18
Sumbul	32	Turmeric	62	Zea Mays	65
Sunn Hemp	21	Turpentine	58	Zedoary	62
Sweet-flag	70	Typhacææ	69	Zingiberacææ	62
Sweet-potato	41	Ulmacææ	52	Zizyphus	19
Sweet-sop	5	Uva	75	Zostera marina	69
Sycamore Fig	52	Umbelliferæ	31	Zygophyllacææ	17
Tabasheer	64	Uncaria Gambir	23, 34		
Taccacææ	63	Upsa	31		
Talipot Palm	71	Urceola elastica	39		
Tallow, Vegetable	48	Uredo	67		
Tamarinds	23				



