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SOME ADDITIONAL
OBSERVATIONS

On the METHOD of
Preserving SEEDS from Foreign Parts,

For the Benefit of
OUR AMERICAN COLONIES.

WITH AN ACCOUNT OF
The GARDEN at *St. VINCENT*,

UNDER THE CARE OF
Dr. GEORGE YOUNG.

By JOHN ELLIS, F. R. S.

LONDON,
Printed for W. BOWYER and J. NICHOLS, at Cicero's-Head, in
Red-Lion-Passage, Fleet-Street.

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LONDON,

Printed by W. B. B. and J. M. B. at the

Printers, No. 10, Strand,

1840.

Some further Observations on the Preservation of Seeds
and Plants in a vegetating State, which have occurred
to me since I published the foregoing.

SEEDS of the *Rheum palmatum*, or true Rhubarb, which were folded up in paper, and sent in letters by the packet to several of our colonies of North America, did not succeed well: whereas those that were sent by the same conveyance, after having been first inclosed in flat tin boxes, or varnished iron snuff-boxes, and then put up into letters, grew very freely, as did those put up in chip-boxes, and kept by the captains of private ships in their chests or bureaus during the voyage. The reason of this defect of the feeds sent by the packet inclosed in paper only, appears plainly to arise from their being pressed too close together by the many letters in the mail, and kept in a damp state for perhaps two months, or more, by which means they became putrid and half rotten by the time they arrived; whereas those that were kept in close tin and other boxes, were free from the damp and putrid air, and remained in an inactive state, perfectly sound, as was evident from their growing freely after they were sown.

Had the seed-vessels, with the feeds of that valuable plant the *Chlamydia*, from New Zealand, which was brought over by Mr. Banks and Dr. Solander, and yields a kind of very fine Hemp, been put into small dry close boxes, or tin canisters,
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they would probably have grown; but unfortunately the best specimens were placed between papers, so that notwithstanding the germen of the seeds looked very fair in the microscope, yet owing to their long continuance between the damp papers in so tedious a voyage, none of them, to our great mortification, have vegetated; nay, even those that were preserved in wax did not grow, for the seeds are too thin and chaffy to keep any time, unless preserved within their capsules in small snuff-boxes, or perhaps in vials.

Another observation occurs to me with regard to seeds preserved in wax, which is, that if they are not sown immediately upon being taken out of the wax, they will certainly perish; and that is one of the reasons why so many seeds of the Tea tree that have been inclosed in wax have miscarried; for when they arrive, the persons who receive them take them out of the wax to be distributed among their many friends, so that they seldom are sown till some time after, when the germen, which soon withers, has already lost all its vegetating powers; hence our hopes are disappointed, and this method disapproved.

There is another instance within my own knowledge of seeds not growing that were preserved in wax: this defect I found was owing to their being kept for some days exposed to the air after they were taken out of the wax before they were put into the ground, and happened in the following manner.

When the chip-box full of acorns, of the growth of the year 1766, preserved through the season in wax, was opened before the Royal Society, December the 5th, 1767, in order to examine whether they were sound, the Præsident, Lord Morton, put some of them in his pocket to try the experiment himself, whether they would vegetate after so long a confinement from the air, as from February to December; and after he

had kept them two or three days, planted them at his country-seat; but not one of them, as he informed me, came up: whereas three out of four of the remainder, that were committed by the Society to the care of Mr. Aiton, at the Royal Garden at Kew, came up, and were produced before the Society the spring following*.

A further confirmation of the danger of exposing seeds to the air, and not sowing them directly when opened, will appear from the following extract of a letter from Fort Marlborough, in Sumatra, dated March the 5th, 1771, to a gentleman in London, who was so kind as to communicate it to me.

“ The Grass-seeds that you sent me in bottles (such as red and white Clover, Trefoil, Lucerne, &c.) I planted immediately a little of each; these grew extremely well. A few days after I sowed some more in a different soil, and only a few vegetated; and fell off immediately. I then thought it was owing to the soil, and directly planted the remainder in the first soil, but not one ever shewed itself, which must be owing to the air let in upon them.” This parcel was put up with Guinea pepper.

This may afford a hint to gentlemen, both in the East and West-Indies, to order their seedsmen to put up the seeds in small packages, that the whole in each package may be sown at the same time; for it appears by this experiment, that the external air, which is very hot in those countries when compared to this, as soon as the seeds are exposed to it, immediately dries up their natural moisture, and causes their lobe leaves and ger-

* I have mentioned in the Phil. Transactions, that there were but 36 acorns at first preserved in wax in the box; but I formed this calculation from the number which Mr. Aiton says he received, which was 34 added to the two that were cut open before the Society, not knowing till some time after the account was printed, that Lord Morton had taken out four, to make the experiment himself.

men soon to perish and grow rancid. Such packets of seeds as are not opened, should be kept as they come over in their bottles, canisters, or jars, in the coolest cellars, in tight casks or close boxes; for we may observe, that it has been the practice of all ages, in hot climates, to keep corn sound by placing it in subterraneous caverns.

I must here take notice of a method that I wish to have tried, in order to bring Mangoes and Mangosteens with the stones found in them from the East-Indies, and also the fruit of the Chocolate Nut, and the Avocado Pear, &c. from the West-Indies.

It is well known to most gentlemen, that the Italians have a method of sending fruit through different parts of the country, by giving them a slight covering of wax, which preserves them fresh for a long time. If then we follow the same method with Mangoes, Mangosteens, Chocolate Fruit, Avocado Pear, and many other fruits, packing them in boxes, or small casks surrounded with clayed sugar, or what is generally called in the shops Lisbon sugar, I make no doubt but the stones and seeds at least will come over in a growing state; some of the ripe Mangoes and Mangosteens in wax, may be covered with paper each, and sent home in small boxes; for should the pulp be decayed, yet the kernels in the stones may be found and in a growing state, as happens in Apples, Oranges, Lemons and Limes, also Peaches, Plumbs and most stone-fruit, the pulp of which is generally rotten before the seeds are sown.

Another reason why so many of the Tea seeds fail, is the method taken by the Chinese to keep them sound; which they do, by drying them in earthen vessels over the fire; and they also treat many of the seeds that come from the northern parts of China in the same manner; this is intended as a caution to curious persons who purchase them, to desire they would spare themselves

themselves that trouble with such as are to be planted. Several of the nuts of the Ginkgo, or Maiden-hair tree, were sent me from China preserved in wax; but my friend wrote to me, that he feared they had been dried by the fire, as Walnuts and Chestnuts are in Spain, to prevent their vegetating while on their voyage; he proposes, if possible, to procure some in a growing state, as this is a most elegant and hardy tree, bearing nuts like the Pistachia tree, which are in high esteem with the Chinese and Japanese, and would grow well in the Carolinas and Virginia, and probably will be very useful to the inhabitants of North America. Mr. Gordon, Nurserman, near Mile-end, has propagated this valuable tree in the open air for near these twenty years past; it is at present but little known, only to the curious in Exoticks.

Since it is extremely difficult to procure the ripe seeds of many valuable plants from the East-Indies, I have recommended it to the several curious gentlemen resident there, to propagate them from cuttings, in pots under bell-glasses of six inches diameter, and seven or eight inches high, taking care to place earth round the outside of the bottom of the glasses, that no air may come to them, but what passes through the earth, and to shade them from the violent heat of the sun*; the cuttings may be about four inches long, and must be taken from the younger shoots of the plant, not the hard woody part†; they must be kept moist till the roots are formed. When these are well rooted, they may be placed with their pots in earth, in casks, or boxes, defended by wires, as I have formerly directed.

* The cuttings are to have but little water till they begin to shoot.

† If the plant is of a soft and spongy texture, it may be proper to take off the cuttings with a little of the former year's growth.

The following plants will succeed, when treated in this manner.

The *Laurus Cinamomum*. True Cinna-
mon.

Laurus Cassia; or, Cassialignea.

Garcinia Mongostona; or, Mango-
steen.

Olea Odorata; or, *Quee-faw*.

Camellia; or, *Tsubakki*.

Mangifera; or, Mango.

Thea; or, Tea Tree.

Piper Nigrum; or, Black-pepper.

Tobago Nutmeg.

In this manner the Gar-
deners here propagate
many of their rarest
plants; the *Garde-
nia*, or Cape Jasmine;
the Tea Tree, &c.
The *Illicium Florida-
num* has lately been
found to strike root
very freely from cut-
tings.

The *Theobroma Cacao*; or, Chocolate Nut.

Cordia Sebestena; or, the Scarlet Clove, without smell, of
Sir Hans Sloane, T. 164, vol. i. Hist. of Jam.

with many other rare plants, which we have not yet been able
by any method to introduce into our publick exotic gardens.

Last year I received from Jamaica a variety of seeds of trees,
many of which were unknown to us here; each kind was tied
up in a piece of coarse brown paper, and the whole packed up
in some sheets of the same. When I examined them by cutting
some of each open, I found that most of them were become
dry and rancid, and very few of them vegetated. To prevent
a disappointment of this kind for the future, I have directed my
friend, when the seeds of the largest kinds which he collects
are ripe and properly sweated and cleaned, to put them into
tight tin canisters, or earthen vessels, such as pickling jars;
each kind of seed may be kept separate in a small bag of old white
linen

linen, or of writing-paper, and all the sorts must be surrounded in the bags with whole rice, millet, panic, or any small farrinaceous grain, to fill up the interstices or vacancies between the seeds; and I do not doubt but wheat bran, or ground Indian corn, if properly dried, would answer the purpose very well. When the canister, or jar, is full, and the parcel closely pressed down, but not so as to bruise the seeds, a small quantity of Camphire should be inclosed in a piece of paper, or small pill-box, and put into the top of each canister, or jar, which must be well stuffed with paper before the cover is put on; the inclosed fumes of the Camphire will destroy the insects; and for the same purpose, in some canisters, instead of Camphire, a small quantity of Sulphur or Tobacco may be put. The tops of the canisters and jars must be secured in such a manner, as to prevent the external air from getting access to their contents. I ought to mention here, that I have received seeds from China, inclosed in tortoiseshell and in horn snuff-boxes, in most excellent order, and some inclosed in two ounce vials, corked and sealed. In a country where moss is to be had, some canisters or jars may have the seeds surrounded with dried moss, instead of the farrinaceous seeds, which I think is an excellent method. These canisters and jars should afterwards be put up in boxes, and packed in saw-dust, chaff, or moss, and kept in a cool part of the ship. These methods are recommended, as few people will be at the trouble of inclosing seeds properly in bees-wax.

N. B. Dried soapy earth, or clean sand, not sea-sand, that has been well washed and dried, may be tried instead of farrinaceous seed, to fill up the vacancies.

Further, I shall advise every curious person, who intends to bring home either seeds or plants, to take out with him a sack

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or two of dried moss, which he may have from the eminent feedsmen, or nurserymen about London. It will take up very little room on board a ship, for it may serve to pack bottles. If the moss is collected while it is green, and in a growing state, and then well dried, no vegetable of that tender texture resists putrefaction so much, nor does any hold moisture so long without decaying; for which reason, it is used with great success by our nurserymen, to keep the earth moist about their pots of plants.

The method of packing is as follows; they put a quantity of rotten fern, or leaves of trees, almost dissolved to mould, into the basket or case; then sink their pots into it; the surface of the pots, and the vacancies between them, must be filled up and covered with wet moss, and then covered over with wheat straw, which must be secured very close over the moss, by sticks placed cross and cross; this will keep in the moisture: The top of the basket, or case, is to be worked over the plants with loose wicker-work, or hoops, and then covered with Russia matting; by these means the plants may be sent a voyage of two months, without requiring any water.

It is with pleasure I hear that a garden is established in St. Vincent's, for the culture of the most useful plants, intended for the general benefit of the American Islands, many of which may, in time, become profitable articles of commerce.

General Melvill cannot be too much commended for the pains he has taken in this most excellent plan, and in placing the care of it under Dr. George Young, principal surgeon to the hospital, whose indefatigable zeal in collecting and propagating a variety of the most valuable plants, is known to all the curious botanists about London; who are so well satisfied of the utility of such a garden, that they have contributed

buted every thing in their power to promote so noble and useful an undertaking.

Dr. Young has favoured me with a catalogue of what plants are now growing in this garden, and of the plants he has lately collected here to carry out with him: which I take the liberty to insert, for the satisfaction of the publick.

A Catalogue of Plants in the publick Garden at St. Vincent's.

Cinnamon.	<i>Sesamum</i> ; or, Oily	Aloes.
Logwood.	Grain.	Coriander.
Safflower.	<i>Cassia Fistula</i> .	Anniseed.
Turmeric.	China Root.	Vanelloes.
East-India Mango.	<i>Gum Galbanum</i> .	Dates.
Paper Mulberry.	<i>Simaruba</i> .	Anatto.
Scammony.	<i>Spigelia</i> ; or, Worm-	Guaiacum.
Colocynth.	grafs.	China Tallow-tree.
Rhubarb.	Citron.	The Plant on which
Tobago Nutmeg.	Bergamot Orange.	the Cochineal In-
Balsam Capavi.	Bamboo Cane.	sect is found.
	Italian Senna.	

The following Plants he takes with him, which he has received from the most celebrated Botanic Gardens about London.

Tea Shrub.	<i>Gardenia</i> .	Balauftians.
Sago Palm.	China Lechee.	Piftachia.
Gum Storax-tree.	<i>Adansonia</i> ; or, Sour	<i>Terebinthus</i> .
<i>Cistus Labdanifera</i> .	Gourd-tree.	<i>Lentiscus</i> ; or, Maf-
Succotrine Aloes.	Gingko, from China,	tic-tree.
Manna Ash.	which bears Nuts	Florida Starry An-
Almonds.	like Piftachias.	nifeed.
Olives.	<i>Casuarina</i> , a heavy	Zant Currant-tree.
Cork-trees.	red wood from	<i>Dracæna Draco</i> , the
Camphire tree.	Otahitee.	Gum Dragon-tree.
		Dr.

Dr. Young has brought a certificate from the chief magistrate of St. Vincent's, that he had growing in this garden 140 healthy plants of the true Cinnamon, the beginning of May, 1772. The Society for the encouragement of Arts, Manufactures, and Commerce, being sensible of the importance of propagating this valuable spice in our American Islands, have presented him with a Gold Medal, as a token of their esteem and approbation.

When Dr. Young first planted the Cinnamon seeds, several parcels of which he had received at different times, he found, though he planted them with great care, that none of them came up: but being driven by stress of weather into Guadeloupe, he obtained leave to go up into the country where there are some Cinnamon-trees; and looking for some seeds that had fallen from these trees, he found many just shooting out their roots among the grass and rotten leaves under them. Taking this hint, the next seeds he received, he sowed very shallow in the earth, under the shade of a tree, and from 200 seeds raised 140 plants.

He further observes, that the grasses to be propagated for cattle, are the Scotch grass, or *Panicum*, the second of Browne's Hist. of Jamaica, and the Guinea grass, or *Holcus*, the second of the same author. The latter requires less moisture than the former; both are propagated by parting their roots, and then planting them in rows, and are of the greatest use in the islands.

In many of our East-India settlements these grasses would be of infinite service, where red and white Clover and Lucerne have been tried, and will not come to perfection: which is the reason of my taking notice of them here. The roots may be brought to England, packed in moss, or replanted in earth, and from hence sent to the East-Indies in wired boxes, where they

they may be of great advantage, particularly the Guinea grafs. The Chinefe have a fmall *Phaseolus*, or Kidney-bean, which they call *Luktau*. This has been lately introduced into Georgia, by Mr. Samuel Bowen, who makes Sago there; he fays, where grafs is fcarce, this furnifhes excellent fodder for cattle, as it may be eafily made into hay; that it rifes from 18 inches to two feet high, and produces four crops in the year. It might, therefore, prove very ufeful to our iflands, as well as to our Eaft-India fettlements.

I cannot avoid mentioning how much we are indebted to the extraordinary attention of John Bradby Blake, Efq; refident Factor at Canton, who fent over laft year a great variety of the feeds of curious plants, from the northern parts of China, which he had procured by means of the Jefuits, and which his father, Capt. Blake, has moft generously difpofed of to the Royal, and other Botanic Gardens, about London, to be properly taken care of. This gentleman has likewife fent a parcel of the Cochin China Rice, the feeds of the Tallow-tree, the fingle *Gardenia*, for dying fcarlet, and many other curious and ufeful feeds from Canton, in order to be fent to our American Colonies, together with a great variety of elegant plants from thence, in a growing ftate. Further, Mr. Blake has now in his employ, two eminent Chinefe Artifts, to paint all the valuable plants of that country, in their proper colours, both in flower and fruit; fpecimens of this work he has fent to his father, and which have been much admired by the beft judges that have feen them.

N. B. It is earneftly recommended to fuch perfons as collect feeds and plants in foreign parts, to remark the particular kind of foil and fituation, in which each plant

grows; and, if they have a thermometer, to mark the height of it, at the time of flowering of each plant, and also the medium of the summer heat, and winter's cold of each climate; which hints may be of great use to Gardeners, who are employed in raising and propagating these plants.

I must further add, that there is at present a laudable spirit among many of the curious East-India captains, who are determined, if possible, to bring over alive, plants of the true black-pepper, the *Cassia Lignea*, the Rattan, and true walking Cane, Mangos and Mangoosteens, *Cardamums*, Sago Palm, Sappan-tree, and *Assa Fœtida*, and to search for the valuable spices near some of our settlements; so that in a few years, I hope, if this useful work is carried on with the same spirit as at present, our Colonies in North-America and the West-Indies, will be in possession of all the useful plants of the East, as well as those of the Spanish and Portuguese settlements in South-America.

F I N I S.

