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TRANSACTIONS,

OF THE

Horticultural Society

OF

LONDON.

Volume V.

T. Woolnoth

Sculpsit

LONDON.

Printed by W. Nicol, successor to W. Bulmer & Co.
Cleveland Row, St. James's.

MDCCCXXIV.

Mo. Bot. Garden,
1897.

PREFACE.

Some apology is due to the Fellows of the Society for the delay in the completion of the present volume of the Transactions, which ought to have been terminated in the spring. The severe and continued indisposition of Mr. William Hooker, in whose charge the entire execution of the engravings had always remained, having rendered him incapable of fulfilling his engagements, considerable time elapsed before the necessary arrangements could be made to supply his place. These have now been effected; and it is hoped, that, in a few months, the arrear in the delivery of the Transactions will no longer exist.

On referring to the contents of the present volume, which has been published in five separate parts, it is satisfactory to observe, not only that the number of contributors of papers has not fallen off, but that the subjects discussed embrace a greater variety of matter interesting to the Horticulturist, than is to be found in any of the preceding volumes. As the Society has risen in public estimation, the communications have increased both in quantity and in value; and the Council has consequently been enabled to exercise more extensively its power of selection. The embellishments have also kept pace with the other improvements; for it will be obvious

how very superior many of the engravings and coloured figures in this volume are to those in former ones.

At the date of the Preface to the preceding volume, the total number of Fellows of the Society was 1520, it has since been augmented to 1915; making an absolute accession of near 400 in about two years and a half. The List of the Society contains altogether the names of 2197 persons, connected with it, either as Fellows, Honorary Members, Foreign Members, or Corresponding Members; an extension which, in the infancy of its establishment, was never contemplated, and which certainly cannot be considered as having arrived at its maximum, since fresh additions are made at each succeeding Meeting of the Society.

The increase in the List of the Members has not arisen solely from British subjects: the knowledge of the operations and objects of the Society has so extended to foreign countries, as to induce the Sovereigns of several of the European states to honour it, by enrolling their names amongst its Fellows; a circumstance which must prove highly beneficial, since it insures a ready protection and countenance to its communications with foreigners. An addition has also been made to the class of Honorary Members, in consequence of His Royal Highness the Duke of York having graciously assented to the request of the Council, that he would allow his name to be entered on the list.

To those who are acquainted with the state of Horticulture amongst us at the present moment, and who remember its condition a few years ago, it will hardly be necessary to point out how beneficial the influence of the Society has been. The general taste for gardening which its example

has inspired; the valuable additions to our stock of fruits and vegetables, but especially to the former; and the unexampled increase in the number of ornamental plants which its industry has made; are ample proofs that the efforts of the Society have been unremitting, and that they have been attended with corresponding success.

In the Preface to the fourth volume it was stated, that, under the auspices of His Majesty's Government, and of the East India Company, three Collectors had been sent to different parts of the world: of these, it is melancholy to add, that only one, Mr. George Don, survives.

Mr. John Potts, who had been sent to Bengal and China, and who had been the means of introducing into this country a large stock of Chinese and East Indian plants, outlived his return but a few weeks; having contracted a disease in the execution of his mission, which terminated in his death, in October, 1822.

Mr. John Forbes, whose destination was the east coast of Africa, with the surveying expedition commanded by Captain William Owen of the Royal Navy, died at Senna, while making his way up the Zambezi river, in August, 1823; having, during the interval between his departure from England and the time of his death, enriched our collections with an unusual number of entirely new plants. To find a successor to this enterprising and intelligent young man was not an easy task. Captain Owen, however, with that zeal for science which always marks his conduct, lost no time in engaging Mr. Hilsenberg, a German botanist, whom he found at the Mauritius; and thus did all in his power to compensate a loss, which botanical science will long deplore.

As the garden stores of China were known to be still unexhausted, it was resolved by the Council to send another collector to Canton; and Mr. JOHN DAMPER PARKS was permitted by the Directors of the East India Company to embark on board the Lowther Castle, commanded by Captain THOMAS BAKER, and bound to China direct, in the spring of 1823. The success of this second mission was great; the plants obtained by it being, for the most part, of great novelty and interest, and nearly all of them having been received in excellent health. In its intercourse with China, the Society has uniformly received the most efficacious assistance from JOHN REEVES, Esq. resident at Canton, and from the several commanders of the Honourable East India Company's ships, who have on all occasions shewn the utmost readiness to promote the views of the Society, by taking charge of the plants sent home from Canton.

In the spring of 1823, Mr. DAVID DOUGLAS was, at the recommendation of Professor HOOKER of Glasgow, taken into the Society's service, with the intention of sending him to Chili; but the disturbed state of that country made it necessary to abandon this design. In order not to leave Mr. DOUGLAS unemployed, it was conceived, that he might be most usefully engaged in bringing from the United States such plants as were wanting in our collection, particularly fruit trees; with this view, he was dispatched, in June 1823, to visit the United States. He arrived at New York in July, and, having made choice of those fruit trees and other plants in the nurseries of New York and Philadelphia which appeared desirable, he employed the interval, before the fall of the year, in making a botanical excursion through the State

of New York, and into Canada. On his return, he embarked at New York with his whole collection, and arrived in London at the commencement of the present year. This mission was executed by Mr. DOUGLAS with a success beyond expectation: he obtained many plants which were much wanted, and greatly increased our collection of fruit trees by the acquisition of several sorts only known to us by name. It would be unjust here to omit mentioning the uniform kindness and attention with which he was received in every part of the United States that he visited. It is most gratifying to have to add, that the *presents* of cultivated plants to the Society embraced nearly every thing which it was desirous to obtain; and that the liberality with which they were given was only equalled by the hospitality with which the Collector was received.

So well were the Council satisfied with the conduct of Mr. DOUGLAS, that they readily embraced an offer which was made in the spring of the present year by the Hudson's Bay Company, to give him a passage out to the mouth of the river Columbia, on the north-west coast of America; and he accordingly sailed for that station in July last. His return is expected in 1826; and, when we consider how rich in plants the country is to which he is gone, we may indulge the hope, that most valuable additions will be made by him to the hardy inhabitants of our gardens. About the same time another opportunity offered, which appeared too tempting to be lost: Lord BYRON, who had been appointed to the command of the Blonde frigate, destined to carry home the attendants of the late King and Queen of the Sandwich Islands, proposed to the Society to take on board a collector, and to afford him

every assistance in his power, for the prosecution of his researches at the various interesting places at which it was intended the vessel should touch, on its way out and homeward. The consent of the Lords of the Admiralty to this proposal having been readily obtained, Mr. JAMES M'RAE, a practical gardener of considerable experience, was selected for the service, and sailed in September.

The advantages resulting from these missions are not confined to the increase of the collections of the Society: for by the acquisition of new and rare plants, it obtains the means of conferring such favours upon the cultivators of those objects, both at home and abroad, as to enable the Society to procure, without difficulty, many articles which otherwise would be almost unattainable; thus not only rendering its own collections more perfect, but extending its reputation and its benefits in every direction.

But it is not merely to the importation of objects deserving the notice of the horticulturist and botanist, that the attention of the Society has been turned. It has always evinced a becoming liberality in transmitting to various places abroad such seeds and plants as were known to be wanting to the comforts of their inhabitants; and it has had the gratification to find, that, in every quarter of the globe to which its influence has reached, these efforts have been duly appreciated, and met by a corresponding feeling. From the East India Company's gardens and possessions, the acquisition of valuable seeds and plants has been very considerable; for which we are almost entirely indebted to the liberality and zeal of the Court of Directors. In the northern regions of America, the authority of the Hudson's Bay Company has been exerted

to procure every thing likely to prove useful or interesting; and from the individual correspondents of the Society in various parts of Europe, as well as in more remote countries, articles of the greatest interest and rarity are frequently received. Indeed there is scarcely any portion of the civilized world in which there is not some one labouring with good will to promote the interests of the Society.

The Library of the Society has been considerably increased, since its state was adverted to in the Preface to the fourth volume. Many valuable and curious works on botanical and horticultural subjects, some the gifts of individuals, and others purchased, have been added; and the whole is now assuming that form which may entitle it to the character of a complete library of reference. Its importance is obvious from the daily use which is made of it by the Fellows of the Society, and by strangers, who are permitted to have access to it. The collection of Drawings has now become of considerable magnitude; and abounds in valuable specimens of works of art connected with the objects of the Society. The collection of models in wax, of fruits grown in Great Britain, has also been so much enlarged as to justify the hope, that an arrangement of them may soon be effected, which will render them highly useful in promoting the knowledge of the different characters of our cultivated fruits.

The Garden of the Society, which has been established at Chiswick, is now in such a state as to enable the public to judge of the nature of its arrangements. The collections of fruit trees, and of hardy trees or shrubs, which it contains, may be pronounced the most complete that have ever been made in this or any other country; and, although much

remains to be done, the value of that which has been accomplished, in a period of little more than two years, must be evident to every one who visits the Garden. As far as the general arrangement and formation are concerned, the works may be said to be nearly finished. Additional walls, however, lodges of entrance, and ranges of houses for the reception of plants, yet remain to be built. For these further expenses, it is hoped, that sufficient funds may be provided.

Regent Street,
December, 1824.

ADVERTISEMENT.

The Committee appointed by the Horticultural Society to direct the publication of the Papers read before them, take this opportunity to inform the Public, that the grounds of the choice are, and will continue to be, the importance and singularity of the subjects, or the advantageous manner of treating them, without pretending to answer for the certainty of the facts, or the propriety of the reasonings contained in the several Papers so published, which must still rest on the credit or judgment of their respective Authors.

It is likewise necessary, on this occasion, to remark, that it is an established rule of this Society, to which they will always adhere, never to give their opinion as a body, upon any subject either of Nature or Art, that comes before them. And therefore the thanks which are proposed from the Chair, to be given to the Authors of such Papers as are read at the General Meetings, or to the Persons who send fruits, or other vegetable productions, or exhibit Inventions of various kinds to the Society, are to be considered in no other light than as a matter of civility, in return for the respect shewn to the Society by these communications.

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List of Persons to whom the Banksian Medal has been presented, by Order of the Council, for Exhibitions at Meetings of the Society, from May 1, 1822, *to May* 1, 1823.

List of Persons to whom the Certificate, in lieu of the Banksian Medal, has been presented by Order of the Council, for Exhibitions at Meetings of the Society, from May 1, 1822, *to May* 1, 1823.

List of Medals and Rewards, presented by Order of the Council, from May 1, 1823, *to May* 1, 1824.

List of Persons to whom the Banksian Medal has been presented, by Order of the Council, for Exhibitions at Meetings of the Society, from May 1, 1823, *to May* 1, 1824.

List of Persons to whom the Certificate, in lieu of the Banksian Medal, has been presented by Order of the Council, for Exhibitions at Meetings of the Society, from May 1, 1823, *to May* 1, 1824.

List of Books and other Articles presented to the Library of the Society, from May 1, 1821, *to May* 1, 1822, *with the Names of the Donors.*

List of Books and other Articles presented to the Library of the Society, from May 1, 1822, *to May* 1, 1823, *with the Names of the Donors.*

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TRANSACTIONS

OF

THE HORTICULTURAL SOCIETY.

I. *Memoir on the different Species, Races, and Varieties of the Genus* Brassica (Cabbage,) *and of the Genera allied to it, which are cultivated in Europe.** *By M.* Augustin Pyramus De Candolle, *Professor of Botany in the Academy of Geneva, and Foreign Member of the Horticultural Society of London.*

Read July 17, and August 7, 1821.

It has been observed, that most of the culinary and economical plants now cultivated in Europe, came, originally, from some other part of the globe. The *Cabbages* may be considered as an exception to this remark, as they appear to have

* In order to afford the British Horticulturist the full advantage of the information contained in this Memoir, an attempt has been made to add the English names of such of the vegetables described by the learned Professor, as are known and cultivated in the English gardens. The reader will find, in the second volume of M. De Candolle's *Regni Vegetabilis Systema Naturale*, under the different genera, the various authors who have mentioned or described the species and varieties now noticed. *Sec.*

been known from the earliest period of civilization, and from being altered by the influence of various climates and modes of cultivation, as well as increased by crosses obtained from the intermixture of races and varieties have become so numerous throughout Europe, as to be deemed unworthy the attention of the learned: insomuch, that botanists and cultivators have alike adopted the various names handed down by tradition, and which have been indiscriminately applied in passing from one province to another, to plants of very different natures. This will sufficiently account for the difficulty of classing and distinguishing the different species, races, and varieties of cultivated *Cabbages;* plants undeservedly neglected, and which I have been led to consider with attention, from the desire of throwing some light on botanical synonyms, as well as from the hope of inducing naturalists to fix their attention on cultivated plants in general.

M. Duchesne, the author of the *Monograph on the Strawberries,* has already published a Memoir* on cultivated Cabbages. Besides his work, which has in some measure guided my researches, I have had valuable assistance from M. Vilmorin of Paris, who, being at the head of a very large commercial establishment in that city, particularly instituted for economical plants, has studied them with care and accuracy, and has deduced very interesting results from his experiments. M. Audibert, settled at Tarascon, has also had the goodness to communicate his ideas arising from facts, which close observation and assiduous practice have led him to discover. M. Sageret, an enlightened

* Article Chou. Lamarck Encyclopédie Botanique, Vol. i. page 742, et seqq.

member of the Agricultural Society of Paris, has also sent me the results of his experiments on cross-bred Cabbages, and the ingenious conclusions which he has deduced from them. Lastly, M. Nestler, Professor of Botany at Strasbourg, where the culture of the oleaginous cruciferous plants is extensive, has obliged me with a few descriptions, and some important remarks, on the distinctions between these plants.

To these several communications I have added the remarks which occurred from my own observation, having, at different times, visited most of the countries where these plants are cultivated; besides which, I have particularly attended to the specimens grown in the Botanic Garden at Geneva, where, from the kindness of Messrs. Vilmorin and Audibert, few of the known varieties of Cabbages have escaped my notice: and I consider it no little advantage to have seen them produced under the same climate, at the same time, and in the same ground, from seeds which had been collected from various countries.

Five species of Brassica* have particularly attracted my attention; the *oleracea, campestris, Rapa, Napus,* and *præcox;* these I shall successively submit to examination, by describing the characters, history, and peculiar varieties of each.

First Species. BRASSICA OLERACEA.

Among the different species of an extensive genus, the cultivated Cabbage is particularly distinguished by its herbaceous and biennial stalk, by its leaves being covered with a

* See De Candolle, Reg. Veg. Syst. Nat. Vol. ii. page 582.

glaucous bloom, and glabrous from their first appearance, somewhat fleshy, not actually scolloped, but sinuated to the midrib, the lower leaves not excepted. It bears a strong resemblance to the *Brassica Cretica*, and the *Brassica campestris;* but the former has a ligneous stalk, and the early shoots and young leaves of the latter are covered with bristles. It differs also from the *Brassica Rapa*, which has hispid leaves, without glaucous bloom; and from the *Brassica Napus*, and *Brassica præcox*, the radical leaves of both which are pinnatifid, or lyre-shaped.

*First Race.** Brassica oleracea sylvestris.

Chou Sauvage. Wild Cabbage.

From universal testimony, this Cabbage is a native of Europe; it is mentioned by Dioscorides,† as an inhabitant of Greece, and Sibthorp‡ expressly says, that he found it wild on rocks near the sea shore of that country. M. Bosc assures us, that it still grows wild on the coasts of France. M. Bouchet found it near Abbeville, on the hilly shores of Treport; and I remember, likewise, to have seen a few irregular plants on the elevated coasts of Normandy; in England,§ it is found more plentifully in Yorkshire, Wales, Cornwall,

* The Professor has used the terms Race, Variety, and Sub-variety, to enable him more distinctly to class and divide what may be considered the Botanical varieties of each species. Each Race comprehends one class of variation, and is divided and subdivided into what he here terms Varieties and Sub-varieties. *Sec.*

† Κραμβη ἥμερος. Dioscor. Hist. ed. Sarr. lib. 2. cap. 146.

‡ Sibthorp, Floræ Græcæ Prodromus, Vol. ii. p. 29.

§ Brassica oleracea. Smith's Flora Britannica, Vol. ii. p. 720. Eng. Bot. plate 637.

and especially about Dover,* where it was noticed by Ray ;† and grows abundantly together with *Cheiranthus Cheiri*,‡ (wild Wall Flower,) on the chalky rocks of that shore. Both these plants are in blossom in the month of May, and are distinguished from each other by their different tints, the flowers of the Wild Cabbage being extremely pale, and those of the Wall Flower a deep yellow ; the stalk of the Wild Cabbage is crooked, half ligneous, branching, and seemingly perennial, though it most probably runs to seed at the end of two, three, or four years, and then dies ; it is from three to four inches in diameter ; the young branches are green, herbaceous, and cylindrical. From the remarkable thickness of the parent stalk, compared with its height, and with the secondary branches, we can easily account for the thick and fleshy stalk of some of its varieties, such as the Chou-rave. The leaves which shoot from the summit of the sterile branches form a kind of rose, giving to the wild plant the intermediate aspect between the two grand races, the Round-headed Cabbage, and the Cavalier or Tall Cabbage, so that one may easily conceive it to have degenerated to both of these. When its natural tendency to form a rose has been gradually decreasing, or, in other words, when the stalk or branches have had a greater tendency to shoot than the leaves, it has produced the race of Cavalier Cabbages ; when, on the contrary, the disposition of growing to a rose has been gaining

* Gerard also found it in the county of Kent, on the shores between Whitstable, and the Isle of Thanet. See Johnson's Gerard, page 316. *Sec.*

† Raii Synopsis Stirp. Brit. edit. 3. Vol. ii. page 293.

‡ Cheiranthus fruticulosus. Smith's Flora Brit. Vol. ii. page 709. Eng. Bot. plate 1934.

strength, and the vigour of the stalk diminishing, the race of round-headed Cabbages has been obtained.

The leaves of the Wild Cabbage are in every respect like those of the Garden Cabbage, fleshy, glabrous, and of a bluish green; the inferior ones are petiolated, and more deeply divided than in the cultivated varieties, from which circumstance one might suppose that the *Brassica Napus* is not essentially different; their terminal lobe is a flattened oval, indented and very large, their surface either plain, or slightly rugose or blistered. On comparing the wild individuals together, it is easy to conceive that by culture varieties have been obtained with leaves more or less swelled out, such as the Milan Cabbage* (Savoy). The leaves of the Wild Cabbage are naturally green, and become red when exposed to the sun, or when old, and diseased; this reddish colour is permanent in some of the cultivated Cabbages, and we shall find that most of the varieties of each race have sub-varieties belonging to them, some green, and some red, the difference in colour forming no essential part of their character. The flowers of the Wild Cabbage are in thick bunches in the shape of a panicle; the lateral ones sprout from the axillæ of the upper leaves. These panicles form a corymb greater or less according to the distance of the lateral branches, and their length, compared with the central one, from which circumstance it is easy to imagine the possibility of increasing the natural disposition of the panicle to form a corymb, and this determines the character of the Cauliflower. The flowers

* The Savoy is known on the Continent by the name of Chou de Milan (Milan Cabbage); but this appellation in England is only given to a variety of the Cavalier or tall Cabbage, noticed hereafter. *Sec.*

of the Wild Cabbage, like those of the varieties most common in kitchen gardens, are of a pale yellow, which we must not confound with the bright yellow of other cruciferous plants; the colour has various degrees of paleness, and becomes white in a few cultivated kinds; this difference however does not appear essential. This minute examination of the Wild Cabbage will lead us to understand how the many cultivated kinds may all be referred to one and the same type. Duchesne has classed the varieties under six principal divisions, or races, viz. the *Colsa*,(Coleseed); the *Choux-verds*, (*Choux-Cavaliers*), (tall or open Cabbages); the *Choux-cabus*, (*Choux-pommés*), (round-headed Cabbages); the *Choux-fleurs*, (Cauliflowers); the *Choux-raves*, (Turnip Cabbages); and the *Choux-navets*, (Turnip-rooted Cabbages, or Navews). I can, however, only admit four of these six races; the Colsa and the Choux-navets belonging undoubtedly to the *Brassica campestris*, their young leaves being bristled. On the other hand, I divide the round-headed Cabbages into two, and I consequently reckon five divisions or races among cultivated Cabbages, in addition to the original type which I have considered as the first of my races, viz. the Cavaliers, or tall or green Cabbages; the Milans, or Savoys; the round-headed Cabbages; the Choux-raves, or Turnip Cabbages; and the Cauliflowers. I proceed to take a rapid view of each of these.

Second Race. Brassica oleracea acephala.
Chou Cavalier. Tall or Open Cabbage.

The Cavalier Cabbage is distinguished by its lengthened stalk and its scattered and expanded leaves, which do not grow to a head. The name of *Chou Cavalier* seems to be

derived from *Chou Caulier,* alluding to *caulis,* a stem, by which names the ancients have at different times spoken of the Cabbage in general. EMILIUS MACER, the first who fully described it, gives it the name of *Caulis herba.** In the south of France it is vulgarly called *Caulet,* from the same origin; be this, however, as it may, there is reason for preserving to this race the name of *Cavalier,* formerly that of the whole species, because it has more affinity than any other to the wild species, and the name has the advantage of recalling to the mind the distinctive character of the plants, a long stem. This race is known under other popular names, such as *Chou Vert,* (Green Cabbage), its leaves retaining their primitive colour from being constantly exposed to the light, whereas the leaves of the round-headed Cabbages turn white; *Chou chessa,* because it is often employed as food for cattle; *Chou en arbre; Chou sans tête;* and *Chou non pommé.* I have adopted the name of *acephala* for the Latin nomenclature, as better expressing the character of the race, than that of *viridis,* employed by MAGNAT and DUCHESNE.† The green hue, in fact, though frequent in this race, cannot be considered as essential to it, many of its varieties having sub-varieties of a reddish colour.

The Cavalier Cabbage has five‡ principal varieties, sufficiently distinct for ordinary practice, though the peculiar character

* Emilius Macer de Herbarum virtutibus. Friburg. 1530, page 61.

† Lamarck, Encyclopédie Botanique, Vol. i. page 743.

‡ The description of the plants known under the general name of Winter Greens, by Mr. WILLIAM MORGAN, published in the second Volume of the Transactions of the Horticultural Society, has enabled me to ascertain the English names of many of the plants enumerated by Monsieur DE CANDOLLE. *Sec.*

of each variety may happen now and then not to be readily distinguished. The first is the ***Brassica ramosa,**** *Cavalier branchu,* (Branching Cabbage), differing only in size from the Wild Cabbage. There is also scarcely any difference discernible between this ramous plant and Daubenton's *Chou vivace.* The second variety is the ***Brassica vulgaris, Cavalier,*** or *Chou vert commun;* this shoots up higher than the preceding one, its stalk remaining nearly single; but these two varieties have little to distinguish them from each other: the latter is most generally cultivated in the western part of Europe, as food for cattle, and sometimes as a garden vegetable; the amazing height to which it grows may be attributed to two causes; the custom of stripping off the lower leaves to give them to the cattle, and to their being planted in close rows in a rich and fertile soil, whereby they often reach four or five feet in height, and continue in vigour for two years together, and sometimes last even three years; this variety is generally known by the names mentioned before, as being applicable to the whole series of the Cavalier; those which are peculiar to it are *Chou en arbre, Chou à chèvre, Grand Chou vert,* and *Chou vert de Touraine.* The common Cavalier is for the most part green, (***Brassica vulgaris viridis***): it takes a reddish cast (***Brassica vulgaris purpurascens***) in the sub-variety designated by Caspar Bauhin,

* This variety appears to be described by Mr. Morgan in the Transactions of the Horticultural Society, Vol. ii. page 314, as the Thousand-headed Cabbage. The French, who also call it *Chou à mille têtes,* seem to have several sub-varieties, which are respectively denominated in the Bon Jardinier for 1821, page 145. 1st. *Le grand Chou à vache;* 2nd. *Le Chou moëllier;* 3rd. *Le Chou vert branchu de Poitou;* 4th. *Le Chou vivace de Daubenton. Sec.*

as *Brassica rubra,* which name is given by the moderns to the red variety of the round Cabbage.* The third variety of the Cavalier is, *Brassica quercifolia, Chou à feuilles de chêne;* (Oak-leaved Cabbage), nearly resembling the next variety, the *Chou frangé.* Different gardeners assure me that they have even seen these Cabbages change from one to the other. Their mode of incisure, however, being distinctly characterised, I do not think proper to confound them. In the Chou à feuilles de chêne, the lobes are deep, broad-oblong, plain, and entire, or nearly so; the extremities not irregularly scolloped, nor the foliage inclined to a reddish hue; it is uniformly of a pale green; this variety is far from being generally cultivated.† The fourth variety is the ‡*Brassica fimbriata, Chou frangé,*§ (fringed Cabbage,) remarkable for its numerous lobes, the edges of which, from being much and closely cut, have the appearance of a fringe; the depth, the number, and form of these incisures vary considerably, and have given rise to as many different names. *Chou vert frisé, Chou frisé, Chou frangé du Nord, Chou frisé non pommé, Chou frisé d'Allemagne,* may be all referred to this variety. The

* The *Chou caulet de Flandres* is described in the Bon Jardinier for 1821, page 145, as differing only from the others by the red colour of its leaves, and may therefore be taken as the red sub-variety of the common Cavalier Cabbage. *Sec.*

† The tall Cabbage known generally in England under the name of Chou de Milan, and described in Mr. Morgan's Paper before alluded to (Horticultural Transactions, Vol. ii. page 315,) is probably a sub-variety of the Chou à feuilles de chêne. *Sec.*

‡ Brassica Sabellica. De Candolle, Reg. Veg. Syst. Nat. Vol. ii. page 584.

§ The Green Borecole, or Scotch Kale of the English Gardens, (see Morgan in Transactions of the Horticultural Society, Vol. ii. page 312,) is evidently this variety; and the Purple Borecole of the English, or Brown Kale of the Germans, also described by Mr. Morgan, is a coloured sub-variety of the same. *Sec.*

Brassica pinnata, Chou plume, or *Chou aigrette,* (feathered Cabbage), can only be looked upon as a sub-variety. The fringed Cabbages vary considerably in colour; some are green, *Brassica fimbriata viridis, Chou vert frisé,* some red, *Brassica fimbriata purpurascens, Chou rouge frisé,* and some streaked with green and red, others with green and white, and others again with green, red, and white, *Brassica fimbriata versicolor;* each of these sub-varieties is to be found springing from the same seed. This Cabbage, though excellent food, is often cultivated for mere ornament, on account of the diversities of its form and colour. It has also been tried with success as an oleiferous plant, and though less useful in that respect than the Colsa, it may be allowed an honourable place in the culture of plants in general, if we take into consideration the produce of its seeds and leaves together. The fifth variety, which, like the preceding, is sometimes, though not so frequently, admitted into ornamental gardening, is the *Brassica palmifolia, Chou palmier,* (Palm-leaved Cabbage),* known by its elongated leaves, having a few incisures, and irregularly swelled out; in this latter property it bears some resemblance to the Milan Cabbage (Savoy), but differs from it in its leaves, which never form into a head, and in its stalk, which is long, like that of the Cavalier; its foliage is of a deep purplish green, and the leaves in some individuals are nearly plain: so much so, that they might be confounded with the true Cavalier; an additional proof that this variety belongs to that race. The *Brassica tophosa,* figured by JOHN BAUHIN,† appears to be a sub-variety which

* This plant is not, I believe, cultivated in the English Gardens. *Sec.*

† John Bauhin, Hist. Plant. Vol ii. page 830, fig. 3.

might be referred either to the Fringed or Palm Cabbage, and tends to prove the diversities of character which unite these varieties: as I have had no opportunity of seeing the plant itself, I cannot class it with any degree of certainty.

To these five varieties, which compose the race of Cavalier Cabbages, I shall add a sixth, which may in time, probably be found sufficiently distinct to form another race; I mean the Cabbage called *Chou à grosses côtes, Brassica costata,* (Large-ribbed Cabbage). The authors who have preceded me in the classification, either rank it among the Cavaliers, or pronounce it to have more resemblance to this race than to any other. Its distinguishing character is a short stem, nearly single, with close leaves, but especially with extremely * thick ribs; it is also known in France under the names of *Chou de Beauvois,* and *Chou à larges côtes,* and is principally sown in village gardens, for the use of the family, being very abundant in produce, though not very delicate in flavour.

While cultivating the *Brassica costata,* I have more than once had occasion to observe a curious sub-variety, or degeneration of the kind; some of the plants emitted from the back of their primary ribs a kind of appendage, similar in consistency to the footstalk of the leaves; these appendages were of different sizes, and the largest dilating at its extremity formed a concave disk resembling a cup or funnel. This singularity recalling to mind the organization of a well known

* The *Cove tronchuda,* an open Cabbage, which has recently been introduced into the English gardens from Portugal, and which has been found so excellent a vegetable, nearly agrees with the above character and description of the Chou à grosses côtes. *Sec.*

Brassica oleracea.

var. costata. Nepenthiformis.

plant, the *Nepenthes distillatoria,* I have given the name of *nepenthiformis* to this sub-variety, and class it immediately under the variety that produced it; but I should not be surprised if the same accident were to be met with in every other variety of Cabbages; and in that case, I disclaim every pretension to rank it even with the sub-varieties, and shall consider it only as an accidental defect. The annexed figure will give a correct idea of this irregular deviation.

Third Race. Brassica oleracea bullata.
Chou cloqué. Blistered Cabbage.

The Blistered, or Milan Cabbage, or Savoy, known to gardeners by its short stem, by its leaves being thickly pressed together when the plant is young, and expanding more or less as it grows older, yet preserving at all times their distinctive character of being blistered all over the surface, occasioned by the parenchyma growing proportionally faster than the nerves, in consequence of which it cannot be contained in the space they leave. This race, commonly known in France by the names of *Chou de Milan,** *Chou de Savoy, Chou cabu frisé, Chou pommé frisé, Chou de Holland,* and *Chou Pancalier,* is intermediate between the Cavalier and the Round-headed Cabbages; it is allied to the first by the intermediate variety of the Palm Cabbage, which, as we observed before, has blistered leaves like the one, and a long stalk like the other, but never forms a head. It resembles the Round-headed Cabbages by the manner in which the leaves are disposed, and differs from it by their appearance, which is plain in the Round-headed Cabbages; or what amounts to

* These are the Savoy Cabbages of the British gardens. *Sec.*

the same thing, the nerves of the leaves are more loosely spread in the one than in the other. Gardeners, in general, distinguish several varieties in this race, which are founded on very slight differences. Such are, according to Monsieur VILMORIN, 1st, the *Milan ordinaire, vulgaris;* 2nd, *the Milan hâtif,* or *petit Milan, præcox,* which is generally smaller than the preceding; 3rd, the *Milan nain* or *court, humilis;* from which the 4th, *Pancalier of Touraine, Turionensis,* does not appear to be distinctly separated; 5th, the *Milan doré, aurata*; 6th, the *Milan à tête longue, oblonga;* this last may perhaps be looked upon as a real variety, its character being more precisely marked, and it is known to have been mentioned by ancient authors. 7th. The *Chou gros d'Ambervilliers, major,* apparently the same as the *Milan des vertus,* or *Pommé frisé d'Allemagne;* all these varieties * undoubtedly belong to the *Chou de Milan,* but I have some hesitation in classing, as an 8th, and last variety, another kind of Cabbage, the *Chou à jets,*† *gemmifera,* considered by good authority to belong to this race. It is remarkable for its elevated stalk, which not only terminates in a looser and more irregular head than the true Chou de Milan, but emits from the axillæ of its inferior leaves a number of small shoots, each terminating in a rose or head, about the size of a walnut, and composed of leaves,

* It is probable that all these varieties of the Savoy are in the British gardens under different names. In Mr. MORGAN's paper on the Winter Greens, before referred to (see Horticultural Transactions, Vol. ii. page 307, et seqq.) he describes the Green Savoy, the Dwarf Savoy, and the Yellow Savoy, as the three most distinct kinds. *Sec.*

† The Brussels Sprouts. *Sec.* (See Morgan, in Horticultural Transactions, Vol. ii. page 309.)

lying more or less closely together. It is very commonly cultivated in Belgium, and is much prized for its delicate flavour; the French call it indifferently, *Chou à jets, Chou à jets et rejets, Chou de Bruxelles, Chou rosette, Chou à mille têtes,* and *Chou vert à petites pommes.* The *Brassica capitata polycephala* of Dalechamp,* may be possibly referred to this variety, though his plate gives but an imperfect idea of it, and has more the appearance of a Round-headed Cabbage, whose head has been accidentally divided in different places.

Fourth Race. Brassica oleracea capitata.

Chou cabus en pomme. Round-headed Cabbage.

This race is more generally cultivated than the preceding ones. The stem of the Round-headed Cabbage is short, its leaves, which at first are close and concave, finally unite in a terminal close head; they are neither blistered nor undulated, as in the preceding race, but the interior leaves, from being sheltered from the light by the outward ones, are pale and watery, better flavoured, and of easier digestion. This race of Cabbages was known to the ancient Gauls by the name of *Chou capu;* the Italians call it *Capuccia;* both names derived from *caput,* a head: whence has proceeded that of *Chou cabus;* it is also called in France *Chou pommé, Chou en tête,* and *Chou pommé à feuilles lisses.* The variations observed in this race are chiefly confined to the shape of the head and the colour of the leaves; the first circumstance appearing to me the most important, I have adopted it, to class the varieties, admitting as sub-varieties, the

* Dalechamp, Hist. General. Plant. 521. f. 2.

green, and the purple or red. The varieties are as follows :* 1st, the *Chou deprimé ou aplatie, depressa,* (Flat-headed Cabbage), the head of which is tolerably large, and round, though flattened at the summit. Some gardeners distinguish it by the name of *Chou de Strasbourg,* while others apply that name to the following. 2nd, *Chou spéhrique, sphærica,* (Round Cabbage), also called *Chou cabus commun,* is of a globular form, and very generally cultivated. 3rd, *Chou obové ou en œuf, obovata,* (Egg-shaped Cabbage), is shaped exactly like an egg, with the small end downwards, and has, I believe, no common name. 4th, *Chou elliptique ou ovale, elliptica,* (Elliptic Cabbage), the head of which is a perfect oval, swelled out in the middle, and equally pointed at both ends; it is called by the French gardeners, *Chou d' York.* 5th, *Chou en pain de sucre, conica,* (Conical Cabbage); the shape of this Cabbage resembles an obtuse cone, or a long egg, the large end downwards; it is cultivated in France under the following additional names of *Chou Chicon, Chou d'Ambervilliers, Chou de Battersea, Chou à tête conique.*

All these varieties are susceptible of keeping the natural colour of their foliage; those that are green on the outside of the head and white in the middle, are called *Choux pommés*

* The arrangement of the Round-headed Cabbages, according to the shape of the head, will afford an excellent guide to any person desirous of classing the sorts, and describing them accurately. All the varieties used in France are not noticed in this Memoir, still less all those kinds which are cultivated in England; no attempt therefore has been made to class English Cabbages here in the manner proposed by the learned Professor. In the two instances of the introduction of English names, the York and the Battersea Cabbages, which he states are applied in France, they are probably correct, since the shape of their heads accords. *Sec.*

blancs, (White Round-headed Cabbages); others, that take a purple tinge, deep only on the outside leaves, are called *Choux pommés rouges,* (Red Round-headed Cabbages). The Spheroidal Cabbage appears to have the greatest tendency to purple of any other; its sub-variety is what is generally called *Chou rouge,* or Red Cabbage. Gardeners again distinguish among the Round-headed Cabbages, the Full Heads and the Hollow Heads; but as this character is far from being constant, it may be looked upon rather as an accident than as a variety in the species. The flowers in this race are generally yellow, but now and then are white in different varieties.

Fifth Race. Brassica oleracea caulo-rapa.

Chou-rave. Turnip Cabbage.

This race is easily distinguished by the swelling of the stalk in the upper part, which forms a kind of round fleshy head on the end of the stem on which the leaves are produced; this swollen part is usually employed for culinary purposes; the comparative thinness of the leaves appears to be also a constant character in this kind. M. Sageret has assured me, that many of the hybrids he had formed from various kinds of Cabbages had the same swelled stalk as the Chou-rave, and I should not be surprised to find among the many different Choux-raves cultivated in gardens, varieties proceeding from other races of Cabbages.

The common Chou-rave and the Chou-navet are often confounded together, each name being indifferently given to both in most of the French provinces; they are, however, distinct kinds. The leaves of the Chou-rave are perfectly smooth, those of the Chou-navet hispid or hairy.

The Chou-rave is swelled only at the head of the stem; in the Chou-navet, on the contrary, it is the root that swells, the stem inclining to diminish where that of the Chou-rave enlarges. CASPAR BAUHIN and LINNÆUS* designate this race by the name of *Brassica gongylodes*, but I have thought proper to preserve that of *Caulo-rapa;* first, as it is more ancient, having been used by LOBEL and CAMERARIUS,† and secondly, as it recals the common name by which it is generally known throughout Europe; and thirdly, as that of γογγυλις employed by THEOPHRASTUS‡ seems rather to belong to the Chou-navet than to this plant.

I distinguish two principal varieties of Chou-rave,§ or Turnip Cabbage; 1st, the *Chou-rave commun, communis,* (Common Turnip Cabbage), its leaves being neither fringed nor curled, but perfectly smooth and even; of this the gardeners have two sub-varieties, known by their colour, viz. the *Chou-rave blanc, alba,* (White Turnip Cabbage), the leaves of which are of a greenish white, and the swelled and fleshy part of the stem still whiter, it is usually called *Chou de Siam.* 2nd. *The Chou-rave violet, purpurascens,* (Purple Turnip Cabbage), so named from the swelled part, and footstalk being purple or red. These sub-varieties, however, are scarcely distinguishable, the White Chou-rave having for the most part a purple tint.‖ The second variety, which I call *Chou-rave crêpu,*

* C. Bauhin. Pinax, page 111. Linnæi Sp. Pl. edit. 2. Vol. ii. page 932.

† Lobel, Adv. pp. 90, 92. Camerarii Epist. 251.

‡ Theophrasti Hist. lib. 7. cap. 4.

§ The Chou-rave is cultivated in the gardens of Germany under the name of Kohl-rabi, and is also much used as an esculent vegetable at the Cape of Good Hope and in the East Indies, where it is called Knol-Kohl.

‖ The French have a third sub-variety, which they call *Chou-rave nain hâtif,*

crispa, has curled and fringed leaves, and is cultivated at Naples under the name of *Pavonazza.* I agree with M. Vilmorin in looking upon this Cabbage as a degeneration of the fringed Cavalier, to which it bears the same relation as the common Chou-rave does to the common Cavalier, except that the swelling in the stalk is less constant in this variety, and more oval than round. The French and Italians must be attentive not to confound the plant vulgarly called Chou-rave with the one so named by the botanists, and written without a hyphen between the words; the first is the *Brassica oleracea Caulo-rapa,* which I have just described; the second the *Brassica Rapa,* which I shall mention hereafter.

Sixth Race. Brassica oleracea botrytis.
Chou Botrytis. Flowering Cabbage.

The race to which, in order to avoid confusion, I am obliged to give the Latin name, has a very peculiar organization, the bunches of flowers, instead of being loosely spread into a pyramidal form, like those of a panicle, are close from their basis, and form a kind of regular corymb; to which is added a second character that may be considered as a natural consequence of the first; the pedicles, from being tightly kept together before their time of blossom, lose their shape, grow fleshy from adhering to each other, and in general produce nothing but the rudiments of abortive flowers; the fleshy pedicles are in general cut for use before the opening of the flowers, so that, contrary to all other varieties, where the

Dwarf early Turnip Cabbage. It has smaller and fewer leaves, and is ready for use sooner than either of the other sub-varieties. See the Bon Jardinier, for 1821, page 146. *Sec.*

leaves and stalk are alone taken for culinary purposes, in this, the floral footstalk is the only part eaten. This race comprehends two varieties, viz. the Cauliflowers and the Broccolis. 1st. The *Brassica cauliflora, Choufleur*, (Cauliflower), has generally a short stem, with white ribbed oblong leaves; the pedicles uniting at the head of the primary branches into thick, short, irregular bundles, in the shape of a corymb: it appears to be a degeneration of the *Brassica oleracea costata, Chou à grosses côtes.* The French gardeners have three sub-varieties of the Cauliflower, *Le dur*, the hard, also called English Cauliflower, *Le semi dur*, the semi-hard, and *Le tendre*, the soft or tender, which is most forward in growth. These sub-varieties, founded on different degrees of firmness of the footstalk, are far from offering a constant character, and seem principally to depend on the nature of the ground, and influence of the climate. The second variety is the *Brassica cymosa, Broccoli;* its stem is more elevated, the leaf-nerves less prominent, the pedicles altogether less thick and close, they are also longer, so that on becoming fleshy, they resemble in shape the young shoots of Asparagus; hence the name of *Asparagoides*, given by the ancient botanists to the Broccoli. The Broccoli seems to be a degeneration of some variety of Cavalier Cabbage. It is divisible into two sub-varieties: 1st, *the common or white Broccoli;* 2nd, *the purple or Maltese Broccoli;* and each of these are again divided into several kinds by the practical gardeners.

Second Species. BRASSICA CAMPESTRIS.

Under the name of *Chou des champs*, Field Cabbage, I comprehend all those that have blue and glabrous leaves at

an advanced period of their growth, like the *Brassica oleracea*, and hairy leaves in the young plants, like the *Brassica Rapa*; they may be considered in this respect as intermediate between the former and the latter. The *Brassica campestris* is indigenous to Europe, and spoken of by Botanists as growing spontaneously in fields in England* and Scotland, in Gothland, in the southern part of Lapland, in Spain near Madrid, in Transylvania, and in the Crimea; but we must observe, that where wild plants are found growing in the vicinity of the very grounds in which the same plant is cultivated, there always remains some doubt as to the origin of the wild one, it being natural to suppose that it proceeded from the cultivated plant in its neighbourhood, and more particularly as they scarcely ever differ from each other.

First Race. Brassica campestris oleifera.

Chou oleifère. Colsat or Colsa, sometimes written Colza.

The plant which I here designate as being the Field Cabbage in its natural state, or very little altered by cultivation, has a slender root, an upright, smooth, and branching stem, about a foot and a half or two feet high, which, together with the foliage, is covered with glaucous bloom, the interior part of the leaves of the young plants, as well as their edges and nerves, are covered with bristles; when older, all the leaves are smooth, the lower ones are petiolated and shaped in the form of a lyre: that is, their inferior lobes are separated as far as the mid-rib and the superior ones united; the stem leaves are bent inwards, embracing the stalk; they are scol-

* Smith, Flora Britannica, Vol. ii. page 718. English Botany, plate 2234.

loped at their basis in the shape of a heart, oblong, and entire at the edges; the flowers are constantly yellow, the leaves of the calyx are half expanded, the seed-pods are upright, round, perfectly tetragonal, swollen in a slight degree, and terminated in a point, which is nearly quadrangular at its base; the seeds are brown, abundant, and tolerably large. This plant is cultivated for the oil contained in its seed, and appears to be the most productive of any that are used for the same purpose. But such is the confusion existing in the nomenclature of these plants, that it is difficult to know, without the minutest description, which are to be referred to the same species. The one now under consideration appears to be the true *Colsa,* cultivated in Belgium, and in several of the eastern parts of France, in Germany, and in Switzerland: in other provinces the name of Colsa is given to the *Brassica Napus oleifera,* or *Navette d'hiver,* while the *Brassica campestris oleifera* is simply called *Navette.* So we must refer the Colsa of Duchesne, and Lamarck, to the *Brassica Napus,* as well as the plant described in the *Flora Britannica** under the name of Coleseed: on the other hand, in the greatest part of the Netherlands, and France, Colsa implies the *Brassica campestris oleifera,* so that to prevent any mistake, I have chosen *oleifera* for the methodical nomenclature, which is at least as comprehensible as the names of Colsa and Coleseed, both merely signifying Cabbage seed, in the German origin. It would be desirable for agriculture that in all countries, cultivators would examine whether the plant they rear is the *Brassica campestris*

* See Brassica Napus in Smith's Flora Britannica, Vol. ii. page 719: and English Botany, plate 2146.

oleifera, or the ***Brassica Napus oleifera,*** which can easily be ascertained by observing whether the young plant is rough or smooth; if hispid, it is the ***Brassica campestris***; if glabrous, the ***Brassica Napus.*** Experiments* made by M. Gaujac show the produce of the first, compared to that of the second, as **955** to **700.** The true Colsa, the plant now described, is generally sown about the middle of June, in well manured nursery ground, from whence it is transplanted after harvest into fields properly prepared, and manured again in November, after which, it stands the winter tolerably well, blossoms in the spring, and soon after runs to seed.

There is a variety of Colsa, called in France *Colsa de Mars,* which may be sown in spring, and harvested in the same year. It is less productive, but may be employed on ground that has not been prepared soon enough in the preceding year, or to replace those plants of other kinds that have perished in winter. I have seen both these varieties when sown in the same ground in the month of May, wear a very different aspect in September; the early or spring one, *præcox,* was in full blossom, and the late or autumn one, *autumnalis,* had not the slightest appearance of a flower. Some authors speak of a variety called the white-flowered Colsa, but as I have constantly seen the flowers of a bright yellow, I suspect this name has arisen from some confusion of nomenclature.

Second Race. Brassica campestris pabularia.

This second race of Field Cabbage is designated by Commeralt in the ***Memoirs of the Agricultural Society of Paris,***

* See the end of this Memoir.

for 1789, under the name of *Chou à faucher*. It is perfectly* intermediate between the Colsa and Chou-navet, and therefore to be considered an hybrid between the two races; the root is fusiform, slender as in the Colsa, but much longer, the stalk is short, like that of the Chou-navet, but not so thick, the radical leaves numerous, hispid on the edges, and on the nerves underneath; they have a long petiole, and are lyre-shaped; the plant bears frequent cutting as food for cattle.

Third Race. Brassica campestris Napo-Brassica. *Chou-navet. Navew.*

The third race of Field Cabbage is that of the *Napo-Brassica, Chou-Navet* (Navew), easily distinguished from the two former by its root being swelled into a tuber near the origin of the stem. Duchesne and other authors have considered this plant as belonging to the *Brassica oleracea;* it is commonly confounded with the *Chou-rave, Brassica oleracea Caulo-Rapa,* but it decidedly belongs to the *Brassica campestris,* its young radical leaves being hispid in the same manner as in the Colsa: this race comprises two distinct varieties, the *common Chou-navet,* and the *Ruta-baga;* the

* Mr. Morgan, in the paper before referred to, (Horticultural Transactions, Vol. ii. page 315,) has described four kinds of Winter Greens without stems, and with fusiform roots, with which M. De Candolle does not appear to be acquainted; their dwarf habits ally them to the Brassica campestris, while other properties shew their affinity to the Brassica oleracea acephala or tall Cabbages; the first, however, nearly approaches the character of this second race of the Brassica campestris, whilst the three last will probably be considered as of hybrid production between the two above-named species. Their names as given by Mr. Morgan are, 1st. Egyptian Kale, or Rabi Kale: 2nd. Ragged Jack; 3rd. Jerusalem Kale, and 4th. Buda Kale. *Sec.*

latter name is frequently given to sub-varieties of the former, which occasions some confusion both among practitioners and those who write on the subject. The real *Chou-navet,** *Brassica Napo-Brassica communis,* is known by its irregularly shaped root, which is either red or white, but never yellow, thence forming two sub-varieties: the white sub-variety, *Chou-navet blanc, alba,* (White Navew), is sometimes mistaken for a Ruta-baga; the other is the *Chou-navet à collet rouge, purpurascens,* (Red Navew.)

The *Ruta-baga, Napo-Brassica Ruta-baga,* also called *Navet jaune, Navet de Suède, Chou de Laponie,* and *Chou de Suède,*† has a root more regularly round or oval, and is yellow both on the out and the inside. It is natural to suppose that the race of Chou-navets proceeds from the Colsa crossed by the *Brassica Rapa;* its characters are intermediate between the two, and Mr. Sageret has found that among the hybrid plants he had obtained from the Colsa, many were swelled out at the lower part of their stem. Care must be taken not to confound the *Chou-navet,* united by a hyphen, with the *Chou navet* written as two distinct words; the former is the

* The Chou-navet is little known in the English gardens, though not uncommon in French horticulture. When cultivated in Great Britain its proper designation is *Turnip-rooted Cabbage,* to distinguish it from the Turnip Cabbage, or the Chou-rave of the French. *Sec.*

† The Ruta-baga is well known in Great Britain, in field cultivation, as the *Swedish Turnip;* though of modern introduction, it is extensively grown. The true and pure sort has yellow flesh and is without a stem, but it is apt to degenerate from both these important requisites to a good plant, either by the flesh becoming white, or by the crown running up into a stem of more or less length. It is remarkable that the *yellow* fleshed Swedish Turnip produces *whitish* flowers, whilst the *white* fleshed bears *dark yellow* flowers. *Sec.*

Brassica campestris Napo-brassica, Turnip-rooted Cabbage just mentioned; the latter, the ***Brassica Napus,*** the fourth species of Brassica, the true Turnip, of which I shall speak hereafter.

Third Species. BRASSICA RAPA,*

Rave ou Navet. Turnip.

Is said to be found in a wild state in various parts of Europe, but the facility with which its seeds can be transported from the place where it is cultivated must leave its native habitat a matter of doubt. This species, first pointed out by Lamarck, in the *Encyclopédie Botanique,*† and called ***Brassica asperifolia,*** comprehended several varieties of the ***Brassica campestris;*** it was afterwards described by Poiret, in the same work,‡ by the name of *Sinapis tuberosa,* which, strictly speaking, is applicable to one only of its varieties; for this reason, as well as to follow the older name, I have thought proper to preserve the name of ***Brassica Rapa,*** introduced by Linnæus.§ This species is distinguished from the preceding by its foliage not being glaucous, but of a decided green, like the Radishes, which are called in French ***Petites Raves;*** secondly, by the inferior or radical leaves being permanently covered with stiff hairs: in every respect the young plant bears more resemblance to a species of ***Raphanus,*** than to one of the genus ***Brassica,*** and as it differs again from ***Bras-***

* Smith's Flora Britannica, Vol. ii. page 719. English Botany, plate 2176. Martyn Flora Rustica, Vol. ii. plates 49 and 50.

† Lamarck, Encyclopédie Botanique, Vol. i. page 746,

‡ Poiret, Encyclopédie Botanique, Vol. iv. page 346.

§ Linn. Species Plantarum, edit. 2. Vol. ii. page 931

sica, by its spreading calyx, it ought, perhaps, to be placed under *Sinapis*, as Poiret and Brotero* have proposed.

First Race. Brassica Rapa depressa.
Navet rond, ou Rave plate. Round Turnip.

The common field and garden Turnip. It has a large root expanding under the origin of the stem into a thick round fleshy tuber, flattened at the top and bottom, and distinctly producing from its lower end, a small slender radicle: this is the race particularly called Turnip; and in French *Raves*, *Grosses Raves*, or *Rabioules*; it is a vegetable too well known as excellent food for men and cattle, to need any further remark on its utility in a memoir essentially destined to the classification of varieties, of which the Turnip offers a considerable number. In the first place, it is variable in size; some are about two inches in diameter, and others six or eight, and even more, which difference, though allowed to be somewhat hereditary, depends in a great measure on the nature of the soil, and manner of cultivation; the many intermediate degrees, therefore, in the size of the Turnip, make it impossible to establish a character of variety upon that difference. Secondly, the flavour of the Turnip offers little less certainty; it is a mixture of the sweet and acrid, the latter quality residing principally in the fibres, the former in the juice; the proportion of these two principles seems to vary according to the nature of the soil: it is not unusual for Turnips to change their flavour when they are grown in a different bed, and from this circumstance, common both to the *Brassica Rapa*, and *Brassica Napus*, most countries boast

* Sinapis Rapa. Brotero Flora Lusitanica, Vol. i. page 586.

of particular localities famous for their excellent Turnips. Thirdly, the different shades in the colour of the Turnip seem to deserve more attention than its size and flavour, and offer some varieties* and sub-varieties to observation. The *White Turnip, alba,* is the most common of all; it is entirely white, except near the origin of the stem, where the root being exposed to the light, the skin takes a reddish tint. The *Yellow Turnip, flavescens,* is of a pale apricot colour on the outside and inside; it is not so common as the white kind, neither does it grow to so large a size, but it deserves the preference for culinary purposes, being much sweeter than the former. The *Black Turnip, nigricans,* known to most of the ancients,† I have never seen, nor am at all acquainted with. The *Red Turnip, punicea,* has the skin of the fleshy part red, and appears to be a slight degeneration of the white species. Lastly, the *Green Turnip, viridis,* mentioned by the ancients, is more likely to prove an accidental variety than a permanent one.

Second Race. Brassica Rapa oblonga.‡

This race differs essentially from the preceding in the shape of its root, which forms an oblong tuber, growing

* It would occupy too much space to give here the names, and peculiar characters of the great numbers of Turnips grown in the gardens and fields of England and France; whenever it is attempted, the classification by colours proposed by M. De Candolle will form a good plan of arrangement. *Sec.*

† C. Bauhin's Pinax, 89-90.—Tournefort Inst. 228.

‡ Oblong Turnips are well known to the English farmers, by whom they are grown, under the names of Tankard Turnips and Decanter Turnips; there are white and red varieties of these; the roots being of looser texture, they are less able to support the severity of our winters, and therefore are used for autumnal feeding, before they can be injured by frosts. *Sec.*

insensibly thinner till it ends in a radicle; it is less fleshy than the flattened Turnip, but with respect to its foliage and flavour, it bears a strong resemblance to the latter, and has not unfrequently been confounded with it by modern botanists. The ancients, on the contrary, distinguished it perfectly well, and described it in most of their works under the name of *Rapa oblonga.* It is now so little cultivated that I have not been able to collect more than a few plants scattered here and there under different denominations, in the several countries where I have studied rural productions, and I have constantly seen it of a white colour. When more particularly attended to, I shall not be surprised to find it offers the same variety of colour as the flattened Turnip. In speaking of it, several ancient botanists have cited examples of the enormous weight to which it arrives. Matthiolus* speaks of an oblong Turnip weighing thirty pounds; those I have seen were, on the contrary, considerably less in size and weight than the flattened Turnip; however, the *Rapa oblonga* is exactly intermediate between that and the following variety.

Third Race. Brassica Rapa oleifera.

Wild or *oleiferous Turnip.*

This third race of Turnips appears to be the wild type of the species, or at least is very near to a wild state; it is distinguished from the two preceding varieties by its root being slender, very slightly fleshy, nearly cylindrical, and running to a point at its extremity. It was mentioned, and tolerably described by ancient authors under the name of Wild Turnip. I recognised the same plant in Dauphiny, under that of *Navette,*

* Matthiolus Comm. page 330.

and I reared from its seeds several individuals resembling the figures given by the ancients. We must not confound the *Navette of Dauphiny*, with the *Alsace Navette;* VILLARS* has described the former under the name of *Brassica Napella*, but the variety β, which he has subjoined, appears to me to belong to some other species, which I cannot affirm to be the *Colsa*, as he mentions that in another article, though he may probably have mistaken it for the *Brassica Napus oleifera*, which is the true Navette. This *Ravette*, or *Navette of Dauphiny*, distinctly separated from every other kind of oleiferous Cabbage by its leaves, which are free from glaucous bloom, and covered with strong bristles, is preferred for cultivation in the southern valleys of the mountains of Dauphiny, in a soil unfavourable to every other oleaginous cruciferous plant; it is less productive than the Colsa, but being of a more hardy nature, is useful notwithstanding; the seeds are sown after harvest, and ripen in the month of June following.

FOURTH SPECIES. BRASSICA NAPUS.

The species to which I give this name, in common with all botanists, though very nearly approaching the *Brassica oleracea*, and the *Brassica campestris*, deserves to be separated from each; it differs from the *Brassica oleracea* by a thicker root and more slender stalk, by leaves more generally scolloped to the mid-rib, and particularly by its expanded calyx. It differs from the *Brassica campestris*, by its glabrous leaves, which are smooth even in their earliest age, and is unlike both in the size of its seeds, which are little more than half that of the others, also by its seed-pod spreading open

* Villars Histoire des Plantes de Dauphiné, Vol. iii. page 334.

when ripe, by which it differs equally from every other neighbouring species. It cannot be confounded with the *Brassica Rapa*, its leaves being both glaucous and smooth; it is thought to be originally of Europe, but its native soil, like that of every plant that has been cultivated time out of mind, is difficult to ascertain; we may separate it into two distinct races, on the principle of the shape of the root.

First Race. Brassica Napus oleifera.
Navette. Rape.

The oleiferous Navette is what is termed in all the northern provinces of France, *Navette, Navette d'hiver*, and *Rabette*; in Germany, *Reps, Rüben*, or *Winter Reps*, and according to the *Flora Britannica*,* Rape,† Navew, or Coleseed, in England. This plant differs from the Navet, properly so called, by its slender root, which is scarcely thicker than the stalk; it is sown after harvest, in summer, or at the beginning of autumn, and the seeds are collected in the following spring; sometimes it is sown in spring, to be gathered in autumn; the cultivators throw it lightly on the ground, and raise the earth afterwards into ridges to clear it of weeds, and place the plants at proper distances; it appears to be less productive than the true Colsa, but more so than the summer Navette, of which I shall speak hereafter; these differences are principally owing to the proportional size of their seeds. The continual confusion, however, arising in botany and agriculture, between the Colsa, Navette, Navette of Dauphiny, the

* Smith, Flora Britannica, Vol. ii. page 719. English Botany, plate 2146. Martyn, Flora Rustica, Vol. iii. plate 103.

† The application of the English term Navew to this plant seems inaccurate, for the Navew is properly the Chou-navet, see page 24. *Sec.*

summer Navette, and winter Navette, naturally leaves great doubts in the mind, as to their respective results. I must own that I felt for a long time much uncertainty in deciding whether the Colsa and the true Navette were two species, or only two varieties of the same species, their differences being of so doubtful a nature; but the unanimous agreement of cultivators on this point, and my own observation on the constancy of their distinctive characters, however slight, have determined me to adopt the first opinion. We must observe, lastly, that the plant indicated by DUCHESNE and LAMARCK,* appears to be our Navette, the English Coleseed.

Second Race. BRASSICA NAPUS ESCULENTA.

Navet. French Turnip.

The *Navet*, properly so called, differs from the *Navette* in the same manner as the Rave from the Ravette; that is, by its fleshy root being thicker than the stalk, and forming a nearly oval tuber; we must neither confound it with the *Brassica Rapa oblonga*, from which it differs by its smooth and glaucous leaves, nor with the Chou-navet, differing also from this by its spreading seed-pod and bare leaves, nor with the Chou-rave, in which the swell in the root is above instead of being below the origin of the stem. The true Navet,† even surpasses in the sweetness of its flavour the sweet Turnip, and has not any of its acrid particles. We distinguish three varieties of Navet by their colour: the *White, alba*, which is the most common; the *Yellow*,

* Lamarck Encyclopédie Botanique, Vol. i. page 742.

† In the early period of the existence of the Horticultural Society (see Transactions, Vol. i. page 86), Mr. DICKSON brought this excellent esculent into the notice of the English gardeners; it is still, however, but seldom cultivated. *Sec.*

flava, of a more delicate flavour; and the *Black, nigricans,* the fleshy part of which is white, and the skin only of a blackish colour.

Fifth Species. BRASSICA PRÆCOX.

The fifth, and last species of Cabbage here mentioned, and unknown to botanists till lately, has long been cultivated by different farmers in various parts of Europe; it is called in the Eastern Provinces of France *Navette d'Eté, Navette de Mai, Navette annuelle,* and in Germany, *Kohl Reps,* or *Summer Reps,* which has the same signification as the French Navette d'Eté; it is distinguished from the preceding by its upright seed-pod, which does not open when mature; from the *Brassica oleracea,* by its expanding calyx, and from the Turnip, by its glabrous leaves; and, lastly, from them all, by its precocity; it is usually sown in spring, and though it blossoms later than the Winter Navette, it has time to ripen in the course of the year, and is distinctly an annual, whereas the two preceding varieties ripen their seed only in the second year.

This species was introduced into botanical gardens by Messrs. Waldstein and Kitaibel, of Hungary, under the name of *Brassica præcox,* a name truly expressive of its nature, and adopted by Messrs. Schultes* and Hornemann.† I have since received from M. Nestler some specimens of it, accompanied with very interesting historical notes and descriptions he calls it *Brassica striata,* as expressive of its character, but the prior claim of the Hungarian botanists, and the desire of coming as near as possible to common prac-

* Schultes Obs. n. 1010. † Hornemann Hort. Hafn. Vol. ii. page 621.

tice, have induced me to adopt their appellation. "This plant," says M. NESTLER, "is often cultivated on hilly ground, where the Winter Navette does not succeed; as the seed is much smaller its produce scarcely exceeds one half of the latter; its seed is lightly thrown into the ground, mixed with that of other plants, such as Lettuces, &c. and requires more space than the Winter Navette to produce a certain number of seed-pods, for if confined for room it has scarcely any."

"Near and about Strasbourg, however, it is less cultivated than the other. Its seed is equally useful in the preparation of oil, for no distinction is made between the oil of the summer and the winter Navette confounded together under the name of Reps öhl, which is particularly used for lamps, after having undergone the necessary process of purification by THENARD's method." At present we know of no variety of the *Brassica præcox*, having a fleshy and tuberous root, as in the preceding species, but it is probable from analogy that it might be susceptible of the same developement.

Messrs. WALDSTEIN and KITAIBEL* think that the *Brassica elongata* might be cultivated with success as an oleiferous plant. This species, known by the extraordinary peduncle of the seed-pod rising above the discus, has several chances of succeeding; in the first place, it is of a robust nature, and thrives in tolerably good ground; secondly, it yields seed abundantly; thirdly, its seed-pods are slow in opening, so that the seeds which ripen first are not lost, while the rest are ripening; this species is cultivated in some parts of Hungary, and I mention it here to attract the attention of botanists and cultivators to it, as a novelty.

* Waldstein et Kitaibel Plant. rar. Hung. Vol. i. page 26, tab 28.

In order to prevent confusion of nomenclature, I shall here mention a few species of the neighbouring genera that have been popularly confounded with the preceding. Of these the first is the *Moutarde blanche, Sinapis alba* (White Mustard);* it is cultivated in the Vosges, under the name of *Navette d'Eté*, but can in nowise be confounded with the plant that more generally bears this name; the leaves are more deeply divided, and have their lobes more indented, but, above all, the seed-pod is short, hispid, and terminated with a kind of depressed horn, in the shape of a dagger; it contains but a small quantity of seeds, and these are of a pale colour. It is generally employed for making mustard, but as I before observed, it is cultivated in some parts of France as an oleiferous plant, under the name of Navette d' Eté, and sometimes it is called *Graine de Beurre.*

The next is the *Camelina sativa,*† which is likewise designated in some provinces by the names of Navette d'Eté, and *Graine de Beurre;* in other places, from a curious confusion of terms, it is called *Camomille !;* the Belgians name it *Door;* the Alsacians, *Dotterle;* the Germans, *Dotter;* and the Italians, *Dorella.* Next to the true Colsa this is the most productive among the oleiferous cruciferous plants, and is known by the following distinctions; its leaves are entire, and prolonged at their basis by little ear-like appendices; its seed-

* See De Candolle Reg. Veg. Syst. Nat. Vol. ii. page 620. Smith Flora Britannica, Vol. ii. page 721. English Botany, plate 1677. Martyn, Flora Rustica, Vol. ii. plate 70.

† See De Candolle Reg. Veg. Syst. Nat. Vol. ii. page 515. Myagrum sativum, Linn. Sp. Plant. ed. 2. Vol. ii. page 894. Alyssum sativum, Smith Flora Britannica, Vol. ii. page 679, and English Botany, plate 1254.

pods are of an oval shape, narrow at the lower part next the peduncle, and contain a great number of small seeds.

The third is the *cultivated Radish, Raphanus sativus,* which might easily be mistaken when young, for the *Brassica Rapa,* and one of its races bears in France the name of Rave; it is distinguished by its seed-pod being nearly acuminated, of spongy consistency, never opening spontaneously, and having compartments within to keep the seed separated. It is said to grow wild in the south of Europe, but this seems to be little more than a conjecture. If it should be, as it is supposed, the Ραφανις* of THEOPHRASTUS, it would most probably be a native of Greece or the neighbouring countries; its analogy to other species of the same group, and, what we know already concerning one of its varieties, *Raphanus sativus oleiferus,* would make me suppose it to have come from Asia. The *Raphanus sativus,* which I studied at the same time with the *Brassicæ,* ought, I conceive, to be separated into two distinct divisions, each of which may probably prove to be species capable of being subdivided into several varieties and sub-varieties. MILLER assures us that he has cultivated them for forty years, without any alteration; nevertheless, most of the modern cultivators have observed several variations in them. Monsieur AUDIBERT, for example, thinks that the colour is more permanent than the form; others speak of several changes of colour. The following divisions, however, appear to be constant; first, that of the common Radish, *Raphanus communis;* its character, a fleshy root, neither compact nor tuberous, of a red, or white colour, but never

* Theophrast. Hist. lib. 7. cap. 4.

black; this is divided into three races perfectly analogous to those of the *Brassica Rapa.*

*First Race.** Raphanus sativus radicula rotunda.

Radis. The Round or Turnip Radish.

The root in this plant is swelled into a round or oval tuber prolonged at the extremity till it becomes a filiform radicle; this race peculiarly bears in France the name of *Radis;* in Italy, *Radice;* and in England, Turnip Radish; it has three varieties of colour, viz. the *white,* the *rose* or *pink,* and the *red* or *purple.*

Second Race. Raphanus sativus radicula oblonga.

Rave. Long Radish.

The root is long, nearly cylindrical, diminishing insensibly to a point at the extremity; in French it is generally called *Raviole,* or *Rave;* in Italian, *Ramolaccio,* and *Ravanello;* in English, the common garden Radish; it offers the same varieties of colour as the preceding race, and has besides a sub-variety of form, which might be more properly termed a variation or accident in the species, as it seldom continues the same when the plant is taken from its native soil. I speak of the French *Rave tortillée du Mans, Raphanus Radiculâ tortili,* (Crooked Radish,) in which the root is so crooked as to resemble a cork-screw.

* A full account of all the varieties of Spring Radishes, both Turnip Radishes, and Long Radishes, has been given by Mr. William Christie, in the Third Volume of the Transactions of the Horticultural Society, Article 84, page 436. *Sec.*

Third Race. RAPHANUS SATIVUS RADICULA OLEIFERA.

Oleiferous Radish.

The root of this Radish is slender, and so thin as to be scarcely fleshy, but the plant is abundantly productive of seed, and well worth cultivating on that account as an oleiferous plant. It was introduced in the time of MILLER under the name of *Raphanus Chinensis.* The Chinese Radish appears to be the type of the cultivated species; its root, according to M. VILMORIN, is in different varieties, *gray, white,* or *red,* a circumstance that would tend to unite all the varieties mentioned in this article, and noticed a few years since at Placentia, in Italy, as belonging to the *Raphano oleifero Cinese,* at which place M. GRANDI* published instructions on the manner of cultivating it.

The second division of cultivated Radishes† is that of the *Black Radish, Raphanus niger,* considered by the ancients and by some few of our moderns, as a distinct species. The root of the first variety of this race is always thick, and black on the outside, compact, and nearly tuberous; it is known in France under the name of *Radis noir, gros Raifort noir, Raifort des Parisiens,* and presents two varieties of shape, the *Oblong, vulgaris,* and the *Round, rotundus.* MORISON‡ and WEINMANN§ have attempted to distinguish the latter, but

* De Grandi Ist. Cult. Piacenza. edit. 6, 1807.

† Mr. WILLIAM CHRISTIE has given a detailed account of these Radishes, under the names of autumn and winter Radishes, in the Fourth Volume of the Transactions of the Horticultural Society, Article 4, page 10. *Sec.*

‡ Mor. Hist. i. page 2, c. 13.

§ Weinmann Phyt. 860.

there does not appear any important difference. Another variety is known by the name of *Raifort gris,* (Gray Radish); this is sometimes extremely pale, or nearly white. The *Raphanus albus orbicularis* of Miller, *gros Raifort blanc,* or *Radis d'Augsbourg,* called in England, White Spanish Radish, is a variety less known.

Observations on the Cross-bred Vegetables, found among the preceding Plants.

There is no doubt that many of the plants which I have enumerated are the results of different cross-breeds, obtained by mere chance, in various gardens, and preserved by the care of agriculturists. Having never found an opportunity of making such experiments methodically, I shall content myself with relating a few facts communicated to me by M. Sageret, who being an excellent and zealous cultivator, has devoted several years to the trial of cross-breeds. The results he has obtained on cultivated Cabbages appear to me worthy the attention of the curious. The cultivated Cabbage, *Brassica oleracea,* according to M. Sageret, presents a singular phenomenon, that of being incapable of receiving fecundation from any but its own species; he tried in vain the pollen of the *Brassica campestris oleifera,* or Colsa, as well as that of every other species of Brassica; he then found out that it had a natural tendency to fecundate several other species of Cabbages, and even the cultivated Black Radish, but it could not be impregnated by any except its own varieties: the *Brassica oleracea botrytis* has not, however, undergone a trial with it. It appears that the cross-breeds known are produced in gardens without any interference.

The Colsa, the Chou-navet, and the Ruta-baga, appear from these experiments to be hybrid products of the Cabbage, and Turnip, taken in different degrees of culture, and domestication; they are none of them capable of crossing the true Cabbage, but may all become fruitful by its means; they can produce amongst themselves other cross-races which bring their own seeds to perfection; the Colsa in particular, cannot be considered as the type of the cultivated Cabbage, as Messrs. Duchesne and Lamarck supposed, but its manner of mixing in artificial breeds, shows, as I have already observed, that it forms a type *sui generis*. One might suppose that the Colsa was originally produced from the Cabbage and the Navette; the *Brassica campestris pabularia* by the Cabbage and the oblong Turnip; the *Napo-Brassica* by the Cabbage and the white Turnip, and the *Ruta-baga* by the Cabbage and the yellow Turnip.

GENERAL OBSERVATIONS.

The several plants which I have offered to notice, and classed according to my own observations, are, as every body knows, disseminated throughout Europe; but from the confusion reigning in their popular and unscientific nomenclature, it was impossible to know which of these species and varieties were spoken of on different occasions, so that the experiments of one country were useless for another, and it was impossible to deduce any general considerations on the nature of these vegetables. In order to apply the classification proposed I shall add two short remarks. The distinction of the several varieties once established, we shall find it

possible to use terms of comparison for the different experiments made by cultivators and more especially for those of Mons. Gaujac.* The medium product of a hectar† of ground cultivated in oleiferous cruciferous plants appears to be,

Brassica campestris oleifera. ‡	Kiliogramme 955 of oil
Brassica Napus oleifera - - -	700
Brassica oleracea acephala fimbriata -	700
Brassica campestris Napo-brassica communis	650
Brassica campestris Napo-brassica Ruta-baga	650
Camelina sativa - - - -	595
Brassica præcox - - - - -	450
Hesperis matronalis - - - -	350
Brassica Rapa oleifera - - -	(undetermined.)
Raphanus sativus Radicula oleifera -	ditto
Brassica elongata - - - -	ditto.

If we now compare the cruciferous plants together, in a different point of view, we shall obtain some curious results on their organization. Most of them, and perhaps the whole number, are susceptible of two different variations, the one having a thin, slender, slightly fleshy root, the other a thick and fleshy root: in general, those of the first kind bear a considerable quantity of seeds, and are cultivated throughout Europe as oleiferous vegetables; the others, on the contrary, bring few seeds to perfection, and are cultivated in general for their roots, as excellent for field or garden vegetables. So in the *Brassica oleracea,* the varieties that have a thin stalk are cultivated for their seeds, and those that have swelled radicles are

* Bull. Soc. Encourag. industr. Paris, p. 67 et 69.

† The Hectar is equal to 2 acres, 1 rood, 35.4 perches English.

‡ The Kiliogramme is equal to 2lb. 8oz. 12.146 grains troy.

reserved for food. Among the varieties of the *Brassica campestris* which, by reason of its large seeds, appears to be eminently oleiferous, the Colsa is the most productive, and has the thinnest root; for the produce of oil, the *Ruta-baga* and common *Napo-brassica* are much less useful. In the *Brassica Rapa*, the Navette with a thin root is cultivated for its oily seeds, whilst the Turnip, or *Brassica Rapa depressa*, is used for food. In the *Brassica Napus*, the Navette with a thin root is cultivated for its oil, and the Navet for the sake of its root. Lastly, in the *Raphanus sativus*, the same circumstance again appears; the thin roots constantly belong to the many seeded varieties, whilst the thick fleshy roots are employed for culinary purposes only. A similar law may be observed in other cruciferous plants. The *Cochlearia Armoracia*, (Horse-radish), which has a very large thick root, rarely brings any seeds to perfection, whilst every other species of Cochlearia produces them freely; this observation may be useful to guide cultivators in the choice of the varieties proper to try as oleiferous plants. If taken in a more extensive sense, it may serve to throw some light on the laws of vegetation in general, for we know it is not confined to cruciferous plants alone; and I should be tempted to elucidate this idea, were it not a digression in a memoir of this nature. There is no doubt that much remains to be done to make the history of Cabbages and Radishes clear and satisfactory. For this purpose it will be necessary to assemble the different varieties cultivated in those countries where I have had few correspondents on the subject. The nomenclature of the divers European languages ought to be ascertained and compared with precision; cross fecundation tried in order to obtain the ex-

isting varieties, or produce new ones, all of which will no doubt be undertaken, and executed one day or other. I shall therefore content myself with presenting this memoir, as a specimen of the method of classification, and nomenclature which appears to me useful to admit among cultivated vegetables in general, and conclude by claiming indulgence for the inaccuracies of detail that, in spite of every endeavour, may have escaped my notice.

II. *Observations on* Horizontal Espalier Training. *In a Letter to the Secretary.* *By Mr.* John Mearns, *F. H. S.*

Read March 6, 1821.

Sir,

I transmit to you some observations on a mode of *espalier training for Pears and Apples*, with a description, and illustration by figures of my method of performing it.

I do not lay claim to the merit of introducing any new practice, for Hitt and others, long ago, pointed out modes of training trees on walls, from which my method of espalier training does not materially differ; but no work with which I am acquainted contains such directions in detail of the practice as will enable an inexperienced pruner to conduct a tree properly from its first planting to its full formation.

Of all the forms of open training, I conceive there are none so well adapted for the garden, either for elegance of appearance, cheapness in trellising, fruitfulness, or which will occasion so little injury to the borders, and surrounding crops, as the horizontal form in Espaliers. I consider five feet a convenient height, and the space of twenty feet for each tree to extend sufficient, but if trees on paradise or quince stocks are used, then half the extent only is necessary.

In the first stage of training, the stakes require to stand as close together as twelve or fourteen inches; and to be arranged in regular order to the full height of five feet; with a rail slightly fastened on the top of them for neatness sake,

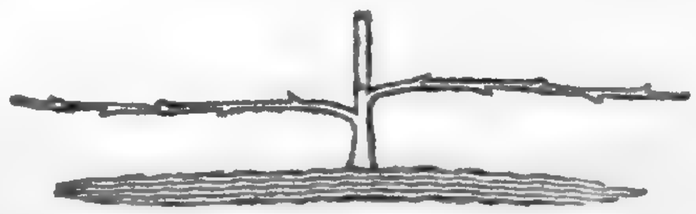
as well as to steady them. If stakes of small ash, Spanish chestnut, or the like, from coppices, or thinnings of young plantations, be used, they will last for three or four years, provided they are from one inch and a half to two inches diameter, at a foot from the bottom. They need not be extended farther in the first instance than the distance it be considered probable the trees may reach in three years growth; at that period, or the following season, they will all require to be renewed; and the new ones may be placed on each side, to the extent that the trees may be thought to require, while these stakes last; finishing the top, as before with a rail.

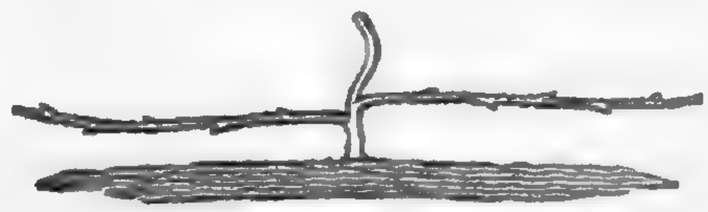
As the trees extend their horizontal branches, and acquire substance, the two stakes on each side of the one that supports the centre leader of the tree, can be spared, and removed to any of the extremities where wanted. And as the tree extends further, and acquires more substance, every other stake will be found sufficient: and the centre stake can be spared also, after the leader has reached its destined height, and is of a sufficient substance to support itself erect. When such a form of training is completed, and the branches of sufficient magnitude, about six, eight, or twelve stakes will be sufficient for the support of the horizontal branches, even when they have the burden of a full crop of fruit. At any other time, about six stakes to each tree will be all that are necessary.

In selecting my trees for the usual horizontal training; I look out for those which have three fine shoots. Or it is better to plant them one year where they are to remain to get their roots well established; and then to head them

down to within eight or nine inches of the ground; and to encourage three shoots from the top of each stool, so that the first and lowermost horizontal shoots may be tied down within ten inches of the ground. When at the end of the season they will have the appearance of the annexed sketch, previous to being tied down.

In the pruning season, I cut down the middle shoot of the three, reserving what is left as an upright leader, its length being about twelve inches from the base of the other two, and these I train in a horizontal position; I fix the middle shoot, which was cut down perpendicularly, to the stake it is planted against. But if it is against a wall or pales, it may be better to zig-zag the upright leader, for the more regular distribution of the sap, and when that is intended, the leader should be left a little longer, to allow of its being bent. In espalier training this zig-zagging is not so readily done, nor do I find it is necessary where the trees are not intended to rise high. When the shoots as above, are laid in, they have either of the following appearances, according as the stem is upright or zig-zag.



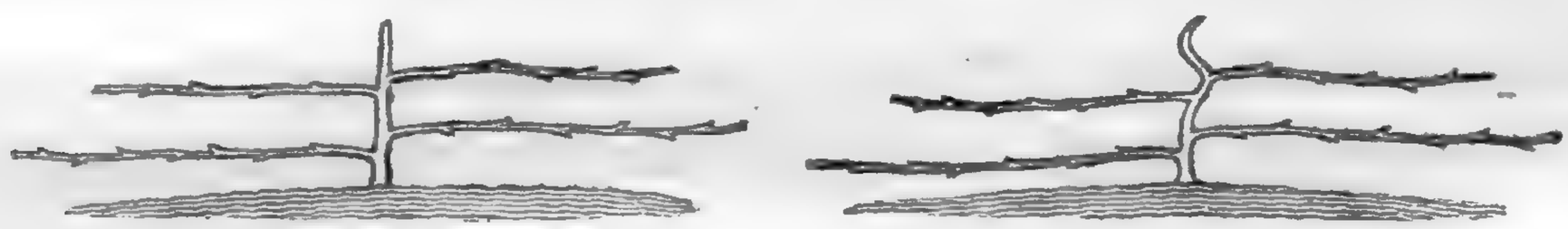


It is always necessary, in the course of training the young wood across the stakes, in summer, to have large osier or

similar rods to tie them to, in order to guide the shoots of the year in a proper direction. The proper ties are small osier twigs.

The following summer I encourage three other shoots in the same way as I had done the season before; and at the end of the season the trees appear thus.

I then cut off the middle shoot at ten, twelve, or fifteen inches above the base of the other two, and train these last, as I had done the similar shoots in the former season; when they appear as under.



And so I continue my training year after year, till the trees have reached their destined height.

From this plan of management it will be readily perceived that the trees are always kept in such vigour, as to be capable of supplying regularly three fine young shoots a year, (at about ten inches apart, which is quite distance enough for espaliers, but a foot is little enough for a wall or pales), and which, to do in regular order, is all that ought to be encouraged, unless the trees are very vigorous, and then a year may be gained by encouraging five shoots instead of three. And

in the course of their summer's growth, they can easily be kept of nearly equal vigour, by tacking or tying them to the wall, or stakes, and as one becomes more vigorous than another, bringing that down towards the horizontal line, and as another is proportionably weaker, raising it towards the perpendicular line. At the end of the season they will all, if so managed, be of nearly equal strength; when four can be brought down to the equidistance of ten, or twelve inches and the leader cut again either to produce three or five shoots in the next, according to its vigour.

Trees against walls may be trained horizontally to the height of ten, twenty, or even thirty feet, if the soil be good, provided they are on a free-growing stock: but for espaliers the height of five feet, as before observed, is preferable. The space of twenty feet allowed for the extension of the horizontals will be completely occupied by the trees in the space of eight or nine years; if they prosper some will have reached their extent by seven years; but where any of them are of sufficient vigour to allow of five shoots being encouraged in one season, the space assigned will be occupied in five or six years in most instances, though longer in some cases. Much however, depends on the soil as well as the nature of the stock.

I am, Sir,

Your very obedient humble servant,

JOHN MEARNS.

Shobden Court,
January 1, 1821.

III. *On the State of* Chinese Horticulture *and* Agriculture; *with an Account of several Esculent Vegetables used in China. By* John Livingstone, *Esq. Corresponding Member of the Horticultural Society, at Macao.*

Read October 2, 1821.

The statement in the *Encyclopædia Britannica*, that "Chinese agriculture is distinguished and encouraged by the Court beyond all other sciences," is incorrect, since it is unquestionably subordinate to literature; and it may be well doubted whether it ought to be considered as holding among the Chinese the rank of a science; for, independently of that routine which has been followed, with little variation, from a very high antiquity, they seem to be entirely ignorant of all the principles by which it would have been placed on a scientific foundation.

Chinese Horticulture may be considered to be in a state precisely similar to that of their Agriculture. Indeed, we hear of no attempts having been made to improve either, in the *Pekin Gazette*, an official periodical publication, in which all notices relative to any variation or change of their practices are made public; and from its silence, I am inclined to infer that no improvement is even contemplated. The following circumstance places the Chinese regard of Horticultural improvements in a just point of view, and accords entirely with all the facts which have fallen under my obser-

Mo. Bot. Garden.
1897.

vations; Potatoes and Cabbages have been cultivated in the neighbourhood of Macao for upwards of half a century, and, although highly profitable and productive, yet the method of growing them has not reached Canton, perhaps has not even extended five miles.

At Macao the same grounds which were Rice fields in the summer are very commonly converted into kitchen gardens in winter. Potatoes are planted in the fields after they have yielded the first crop of Rice. It is therefore impossible to establish any distinction between the Agriculture and Horticulture of the Chinese, merely from the place of cultivation. Enclosures are seldom seen, and are perhaps never made solely with a view to any particular branch of husbandry. A correct idea therefore of Chinese garden cultivation will be best obtained by a brief description of their agricultural process.

The Chinese plough is exceedingly simple, and appears to be the same as that employed all over the East: it is drawn by a single buffalo, ox, or cow; horses are never employed. The plough being without a coulter, nothing like a regular tillage is ever attempted. The principal object appears to be, in the first instance, to expose the soil as extensively as possible; and this is best effected by throwing it up in large masses, in which state it is allowed to remain till it is finally prepared for planting. When sufficient rain has fallen to allow the husbandman to flood his fields, they are laid under water, in which state they are commonly ploughed again, in the same manner as for fallow, and then a rake, or rather a sort of harrow, about three feet deep and four feet wide, with a single row of teeth, is drawn, by the same animal that

draws their plough, perpendicularly through the soil, to break the lumps, and convert it into a kind of ooze; and as the teeth of this rake or harrow are not set more than from two to three inches apart, it serves, at the same time, very effectually to remove roots, and otherwise to clean the ground. For some purposes, the ground thus prepared is allowed to dry; it is then formed into beds or trenches; the beds are made of a convenient size for watering and laying on manure. The intermediate trenches are commonly about nine inches deep, and of the necessary breadth to give to the beds the required elevation; but when the trenches are wanted for the cultivation of water plants, some part of the soil is removed, so that a trench may be formed of the proper dimensions.

The implement used for these purposes is a hoe, commonly ten inches deep, and five inches broad, made of iron, or of wood with an iron border, and for some purposes it is divided into four or five prongs. By constant practice the Chinese have acquired such a dexterous use of this simple instrument, that they form their beds and trenches with astonishing neatness and regularity. With it they raise the ground which has not been ploughed, from the beds and trenches, by only changing it from a vertical to a horizontal direction, or employing its edge. It is also used for digging, planting, and in general for every purpose which a Chinese husbandman has to accomplish.

The next objects of consideration are their manures, to which they are by no means inattentive. Vegetable or wood ashes are esteemed the very best manure by the Chinese. The weeds which were separated from the land by the har-

row, with what they otherwise are able to collect, are carefully burnt, and the ashes spread. The part of the field where this has been done is easily perceived by the most careless observer. Indeed the vigour of the productions of those parts of their land where the ashes have been applied is evident as long as the crop continues on the ground. The ashes of burnt vegetables are also mixed with a great variety of other matters in forming the compositions which are spread on the fields, or applied to individual plants.

The plaster of old kitchens is much esteemed as a manure, so that a farmer will replaster a cook-house for the old plaster, that he may employ it to fertilize his fields.

The Chinese have a high notion of the value of night-soil, the collection of which, and its formation into cakes, by means of a little clay, clay and lime, or similar substances, gives employment to a great number of individuals. They transport these cakes to a great distance. This manure in its recent state is applied to the roots of Cauliflowers, Cabbages, and similar plants, with the greatest advantage.

The dung and urine of all animals is collected with great care; they are used both mixed and separately. The mixture is less valuable than the dung, and this for general purposes is the better, the older it is. Horns and bones reduced to powder, the cakes left after expressing several oils, such as of the ground-nut, hempseed, and the like, rank also high as manures. Small crabs, the feathers of fowls and ducks, soot, the sweepings of streets, and the stagnant contents of common sewers, are often thought sufficiently valuable to be taken to a great distance, especially when water carriage can be obtained.

Lime is employed chiefly for the purpose of destroying insects, but the Chinese are also aware of its fertilizing properties.

For Horticultural purposes the Chinese may be said rather to manure the plant than the soil. The nature of the climate in the southern part of the empire seems to justify fully this very laborious but economical practice. Rain commonly falls in such quantities and force as to wash away all the soluble part of the soil, and the manure on which its fertility is supposed to depend, and this often appears to be so effectually done, that nothing meets the eye but sand and small stones. It is therefore proper that the Chinese husbandman should reserve the necessary nourishment of the plant to be applied at the proper time. For this purpose reservoirs of the requisite dimensions are constructed at the corner of every field, or other convenient places.

With the seed or young plant its proper manure is invariably applied. It is then carefully watered in dry weather night and morning, very often with the black stagnant contents of the common sewer; as the plants advance in growth the manure is changed, in some instances more than once, till their advance towards maturity makes any further application unnecessary.

I now proceed to mention a few of the vegetables which are grown in the method I have described, for the same purposes as plants of a similar nature are cultivated in the gardens of Europe.

1st. The Chinese produce in the greatest abundance, during the hot months, in trenches filled with water, the *Convolvulus*

reptans of LOUREIRO. It never yields seed here, perhaps in consequence of the frequent gathering, it is therefore always propagated from cuttings.

2nd. The *Basella nigra* is cultivated by sowing a few seeds in the first instance; the plants from these run quickly over an extensive space, and yield a profusion of cuttings, with which any quantity of ground may be planted. It requires a moist soil, and to be well watered; it also grows well on the sides of ditches. The cuttings are planted at the distance of about ten inches apart. The leaves are much esteemed when boiled.

3rd. The *Amaranthus polygamus*, and 4th, the *Amaranthus tristis* (perhaps also some other species of the same genus,) are very extensively cultivated about Macao and the neighbouring parts of China. The seed is sown in beds, in succession, and carefully watered. The plants are taken up while young and tender, and seem to be most esteemed of all their summer vegetables.*

5th. *Sinapis Pekinensis.* This plant is more extensively used by all classes of the Chinese than any other, perhaps than all the others together. It is carried about the public streets for sale, boiled, in which state its smell is extremely offensive to Europeans. The seeds are sown in beds very frequently, and the plants are transplanted almost daily, to keep the ground full. It is cut in every stage of its growth, which is surprisingly rapid. It is planted sometimes very

* The Chinese boil the Amaranthus as well as the Convolvulus and Basella with a little fat pork. They become very tender and well tasted, and somewhat resemble Spinage.

closely when the plants are to be used young, but when wanted full grown, at about a foot distance. It seems to require no particular management, except frequent watering. It grows best in the cold weather, and doubtless will thrive well in England. Its rapid growth may recommend it to the agriculturist as a cheap food for cattle, but it gives to milk the peculiar taste of its genus.

6th. For the present, I shall confine myself to notice one more plant, which I think has not been hitherto described. It is a species of *Brassica* that may be distinguished from the other species of that genus by its procumbent habit, and a very remarkable change of some of the leaves; about the time the plant begins to flower they become larger and rounder, the ribs broader, and of a more intense white, and the border more thickly and deeply plaited. In several respects it resembles the Scotch Kale. It is fit for the table in September, and continues to supply the green-market very abundantly all the winter. The outer leaves are commonly left on the stem; from the axillæ of these, sprouts quickly shoot, which are very tender, and as well tasted, perhaps, as any of the Coleworts. It is used by the Chinese in every stage of its growth, (which is also very rapid,) even when it shoots into flower. It cannot be supposed that this plant can come into competition with the Cabbages, Cauliflowers, and Broccoli of Europe, but where, from the warmth of the climate, those plants cannot be cultivated, I make no doubt it will be esteemed as a good substitute.

I have transmitted to the Society, together with this communication, seeds of all the plants above mentioned, except

the first; I have also sent seeds of the *Fluted Cucumber;* it is much cultivated by the Chinese near Macao, and greatly esteemed by them, when boiled, as an article of diet; to me the taste is disagreeably bitter.

IV. *On the* House Management of Peaches *and* Nectarines. *In a Letter to the Secretary. By Mr.* Patrick Flanagan, *F. H. S. Gardener to Sir* Thomas Hare, *Bart. F. H. S. at Stow Hall, Norfolk.*

Read September 4, 1821.

Sir,

In compliance with the wish expressed by you, I send, for the Society, an account of my method of *forcing Peaches and Nectarines.* I will first describe the plan I follow in planting the trees, and then detail my system of management during the first season, after which I will give the mode of treatment in the second season, which last is equally applicable to all future years.

The soil which I generally use for Peaches and Nectarines whether in houses or on open walls, is the top spit of a pasture of rich yellow loam, if it can be procured, without adding to it any manure whatever; but if the soil be poor or sandy, it should have a little rotten dung mixed with it. If convenient, this mould should be laid up in ridges five or six months before it is wanted, and turned over twice or thrice during that time.

When the house is ready, the borders, both inside and outside, should be cleared to the depth of three feet, and be well drained, as well as paved at bottom with slate or flat tiles, to prevent the roots of the trees entering the bad soil which may be at bottom. This being done, the new earth must be

wheeled into the cavity of the border, and every layer of it that is put on, should be well trodden down until the whole is filled up, allowing a few inches above the level for settling, which will be, however, very trifling.

The best season for planting is the latter part of autumn, or beginning of spring. And the most expeditious way of furnishing a house is, to plant clean well-worked maiden plants, previously grown in good stiff loam, and trained against a wall three years before they are taken for such purpose. At that age they will have gained such strength, and got so well established in the soil, that they can be removed with large balls, and with the greatest safety, into the places where they are to remain; they will scarcely feel their removal.

I generally place a compost of three parts loam, and one part rotten dung immediately round the roots, in order to encourage the plants to strike more freely into the border.

In the first season the commencement of the forcing is in the second week in February, when the lights are put on the house; I begin to add a little fire-heat in the last week in the month, and gradually increase this as the spring advances. I obtain a temperature of from 53° to 55° from fire, and I do not allow the sun-heat to exceed 75°. The heat at night is kept uniform by means of a moderate fire, and in the day by the admission of air.

The trees during the first summer should have frequent bottom waterings, and be well syringed with clear water two or three times a week, this will greatly promote their growth, and keep them clear of insects. Should the green fly, or

red spider make their appearance, two or three strong fumigations with tobacco, and frequent spunging will keep the trees clean.

If the trees appear to make luxuriant shoots in any part where bearing wood is wanted, the shoots should be stopped at the third or fourth leaf, and if they are still inclined to grow strong, they must be stopped a second time; this will obtain kindly wood. Two or three times in the spring the whole should be looked over, and the shoots moderately thinned out, leaving those which are most kind and well placed at regular distances for the next year's bearing. The first thinning of the young shoots should be just after the fruit is set, and when they are eight or ten inches long; when at that length, they must be laid in at such distances as to admit the sun and air to ripen the wood destined to bear in the ensuing season.

The principal business of the first season is to keep the young wood regularly laid in, to attend to the top and bottom waterings, and to the free admission of air at all opportunities. If all this has been done, and the plants have been kept clean, they will in this season have made plenty of good bearing wood for the next year, and they will have nearly covered half the extent of trellis within the house.

I generally take off the whole of the sloping lights for the winter months, and cover the borders and flues with five or six inches of light litter, to prevent severe frosts doing injury to either.

Commencement of the Second Season of forcing.

The glass should be put on in the last week in January, the house be well cleaned all over, and the flues, as far as

possible, should be white washed, and then the trees should be pruned.*

Previous, however, to tying the trees to the trellis, I have the whole of their stems, but not the bearing wood, washed with a composition formed of one pound of soft soap, one ounce of tobacco, and a little flower of sulphur, to which is added as much boiling water as will make the whole of the consistence of paint. This composition is carefully applied with a painter's soft brush, whilst it is milk warm. The process of cleaning should never be omitted at the pruning season, as it prevents the trees ever contracting the brown scale. When the trees are tied to the trellis, the borders must be dug; this gives the house a clean and neat appearance.

In the first week in February the house is shut up every night, and plenty of air given in the day; in the beginning of the second week, moderate fires are made, just to keep the heat by fire from 45° to 50°, not exceeding 70° of sun-heat; in the third week the fire-heat is gradually encreased from 50° to 55°, and not exceeding 75° sun heat. By this time the trees will be getting into blossom. Whilst they are in bloom I neither sprinkle nor steam the house, for I consider that sufficient moisture arises from the earth in the house at this stage of forcing. I admit plenty of air every day, when the wind is mild, and in a favourable quarter.

When the petals have all dropped, and the fruit is fairly set, I give the trees a gentle syringing on a fine morning, with clean water, and if any green flies appear, they have two

* I have not laid down any rules for the winter pruning, as almost every gardener seems to have a method peculiar to himself of performing this work.

or three smokings with tobacco, as directed before; this will totally destroy the insects.

At this period (March) particular attention must be paid to the regularity of heat, which may be progressively encreased a degree or two as the season advances, but I do not allow it to exceed the last named temperature until the fruit is perfectly stoned, when I increase it from 55° to 60° at night, and from 77° to 80° of sun-heat. At the medium of these the temperature should continue during the remaining part of the season.

Attention must be paid to the thinning of the young shoots, as directed in the first year's management, and when the young fruit are about the size of Damsons, they should then be moderately thinned for the first time, leaving a sufficiency for selecting a full crop by subsequent thinnings, which should be performed at two or more different periods.

It is to be observed that a few days before, and a few days after, the crop begins to stone, is the most critical period in forcing, and if strict attention is not paid at that time to the due regulation of heat, and to the free admission of air at all opportunities, a great portion of the fruit will fall off. I have often seen three parts of the crops of Peaches and Nectarines thus lost.

The borders within the house must be occasionally watered, after the stoning, until the fruit is arrived at full size, and begins to change colour, then all watering should be left off, both with the syringe, and on the borders.

When this crop of fruit begins to ripen, which will be about the second week in July, I gradually expose the house to the

open air on fine and dry days, by drawing down the lights as much as convenient in the day, and shutting them again in the evening. It is this which gives the fruit both flavour and colour.

This crop thus produced furnishes the table from the second week in July until the middle of August, then a second house should become ripe, and continue to yield a supply until the fruit comes in on the open wall.

The above practice is the result of many years experience, and I lay it before the Society with confidence, having never failed under it to obtain abundant crops.

I have the honour to remain,

your most obedient humble servant,

PATRICK FLANAGAN.

Stow Hall,
19*th August,* 1821.

V. *Observations on the accidental* Intermixture of Character in certain Fruits. *By* Mr. John Turner, *F.L.S. Assistant Secretary.*

Read January 16, 1820.

In the course of the two last seasons, several specimens of fruits came within my observation, in which a deviation from their true character was very perceptible. In remarking on the evident intermixture of colour, form, and flavour, which some of these fruits presented, I did not hesitate to ascribe it to the farina of one variety having come in contact with the flowers of another at the moment when the stigmas were in a proper condition to receive it: and on mentioning my opinion, was surprised to find that the fact of such intermixture producing an *immediate* change in the fruit was generally doubted, and by many persons pronounced to be impossible. This led me to enquire whether the subject had ever before engaged the attention of horticulturists, and, not to go further back than the beginning of the last century (though both Theophrastus and Pliny* seem to allude to it), I found that the notion was entertained by Bradley, who, in his *New Improvements in Planting and Gardening*,† after giving directions for fertilizing the female flowers of the Hazel with the pollen of the male, says,—"By this knowledge we may alter the property and taste of any fruit, by impregnating the one with the farina of another of the same class, as, for exam-

* Theophrast. Hist. Plant. l. ii. c. 4.—Plinii Hist. Nat. l. xvii. c. 25.

† Second Edit. page 22.

ple, a Codlin with a Pearmain, which will occasion the Codlin so impregnated to last a longer time than usual, and be of a sharper taste; or if the winter fruit should be fecundated with the dust of the summer kinds, they will decay before their usual time; and it is from this accidental coupling of the farina of one kind with the other, that in an orchard, where there is variety of Apples, even the fruit gathered from the same tree differs in its flavour and times of ripening; and moreover, the seeds of those Apples so generated being changed by that means from their natural qualities will produce different kinds of fruit if they are sown."

In the *Philosophical Transactions*, also, for the year 1745, the subject is noticed by Mr. Benjamin Cook, in a paper, *Concerning the effect which the farina of the Blossoms of different sorts of Apple trees had on the fruit of a neighbouring Tree.* In this communication it is stated that Mr. Cook "sent to Mr. Peter Collinson some Russetings changed by the farina of a next neighbour, whose name he wanted skill to know, but could only say, that the Russeting had acquired his face and complexion. Mr. Collinson then produced several samples of the Apples: an untainted Russeting, a Russeting changed in complexion which grew among a great cluster of unaltered brethren, and some Apples of the other tree which had caused the change in the Russetings, and whose fruit had, in return, received a rough coat from the Russetings."

A further proof of such intermixture taking place is given by the same writer in the *Transactions* for the year 1748, and again alluded to by him in those for the year 1749.

Having thus shewn, that the opinion now entertained is not

a novel one, I shall proceed to mention the instances which I have observed.

In the spring of 1819, I gave some carefully saved Melon seeds of the Netted Succado kind to a friend near London. The young plants raised from these were injudiciously planted by the gardener in a frame with another larger and inferior variety. The fruits of the Succado set well, but as they swelled, they gave evident symptoms of having lost their true character, and when cut, were found to be very worthless, arising, as I conceive, from the share which the inferior variety had in them.

In the autumn of the same year, I examined on the trees in Mr. BRADDICK's garden at Thames Ditton, an evident mixture of character in a Codlin, and the Ribston Pippin, in more than one individual, on the sides of the trees next each other, while the fruit on the opposite sides were wholly untainted. The probability of such mixtures taking place is great in Mr. BRADDICK's garden, owing to many varieties being grafted on the same stock, and to the closeness with which both the espalier and standard trees are planted.

Early in the year 1820, Mr. BRADDICK sent to the Society samples of two sorts of Apples of the preceding year's growth, which he had himself taken from the trees, and carefully preserved, to show the extraordinary sport which they had made. The two sorts were, the Holland Pippin, and the White Winter Calville, Apples totally dissimilar in appearance; they grew on low standards, very near each other; two of the specimens gathered from the sides of the trees not contiguous retained their natural character perfectly well, but the White Calville gathered from the side of

the tree next the Holland Pippin had lost much of its own form, and colour, and partaken largely of that of its neighbour, while the Holland Pippin, taken from the side next the Calville, had become nearly a Calville in form and colour.

In October of the same year, Mr. Brogden shewed me two Apples, in which a no less remarkable change had taken place. The one was a French Crab, grown near a Ribston Pippin, the character of which it had taken, and the other was a Golden Pippin which grew near a Russet, and in which the two varieties, though so widely different, were evidently blended.

These several instances all coming within my observation in the course of two seasons, have fully satisfied me that a change both in character and quality of fruits is frequently effected; it will be for the physiologist to instruct us as to the mode by which it is done, and probably a close investigation of the subject may discover in this process of nature sufficient to account for the occasional appearance of a Nectarine on the same branch with a Peach: this, indeed, appears to me a more reasonable mode of accounting for such an anomaly than any which I have yet heard suggested.

I have noticed these few facts for the purpose of drawing the attention of horticulturists to the subject, and I trust that those who have leisure and opportunities, will, by actual experiment, endeavour to ascertain whence these occasional deviations arise. Such an investigation will not be useless, for if there does exist in fruits such a liability to change, it will at once be evident to the intelligent cultivator how much care is requisite in growing Melons, Cucumbers, &c, to secure

their true characters, even without reference to saving seed for a future crop. Such experiments, will, I doubt not, frequently succeed if made with care, and on large flowered plants; on Apples, Pears, &c. it will probably be accident only that will give success.

Note by the President.

The Council of the Horticultural Society having done me the honour to ask my opinion upon the subject of the foregoing Paper; I beg leave to observe, that, not having seen the varieties of fruit mentioned in it, I feel much less qualified to judge than those gentlemen who had opportunities of inspecting all the circumstances. The evidence given, however, is much more than sufficient to satisfy me most perfectly that the variations of form and quality were as extensive as they are described to have been: and indeed I have stated in a former communication to the Society,* a much more extraordinary circumstance of the same kind, in which a branch of the Yellow Magnum Bonum Plum tree bore *red* fruit, perfectly similar in appearance to the variety usually called the Red Magnum Bonum Plum. This occurred in one season only; after which the branch recovered its former habits. My garden did not contain the variety last mentioned, but if it had, I should not be in the least inclined to attribute the change of colour and character, which occurred, to the operation of its pollen; for I have in some hundred instances (I can in truth say, in some thousand instances) introduced the

* See Transactions, Vol ii. page 160.

pollen of one variety of the Plum, the Pear, the Apple, the Cherry, the Peach, the Melon, and other fruits, into the blossoms of others, of very different and opposite habits, and I have never (although I have most closely attended to the results) found in any one instance, the form, colour, size, or flavour of the fruit belonging to such blossoms in any degree whatever changed, or affected. The fruit and seed coats, in all cases, which have come under my inspection, are given wholly by the female parent; and the interior and essential parts of the seeds, those which constitute the future plant, are alone changed by the male parent, without which, I believe, these never exist. I therefore conceive myself fully qualified to decide, that in the deviations of the fruits mentioned from their ordinary character, the operation of the pollen of another variety was not the disturbing cause.

Note by the Secretary.

There can be no doubt of the fact, that Apples produced on contiguous branches of trees growing near to each other do occasionally assume the shape and appearance of their neighbouring variety. The specimens described by Mr. Turner, were all shewn to me, and they bore such decidedly different characters from what properly belonged to them, and approached so much in resemblance to the kinds near to which they had grown, that it was impossible not to admit the change to have taken place in consequence of their contiguity. The difficulty of the subject at present lies in assigning the cause to the effect produced.

In the alteration made in the Succado Melon mentioned by Mr. TURNER there does not appear to have been any attempt at artificial impregnation; but there is an instance recorded in the Society's *Transactions,** of a change having taken place in a Melon purposely impregnated by the farina of another variety, by Mr. DAVID ANDERSON, in Lord MONTAGU'S garden at Ditton Park. I have also been lately (December, 1821) informed of a similar variation of external form having occurred in the last season in the collection of plants belonging to Mr. GRIFFIN at South Lambeth. A blossom of *Amaryllis vittata,* the capsule of which is nearly globular, having been impregnated by the farina of one of those species of *Amaryllis* from South America, whose capsule has its angles very gibbous at the base, the hybridized capsule, when it grew towards maturity, assumed the shape belonging to the species which had furnished the impregnating pollen. These deviations from the usual course of nature are not however sufficient to establish the position that the change is effected by impregnation, whilst the long experience of the President, as stated by himself, is opposed to the possibility of such change. It remains therefore for us to attend to, and to investigate the phenomena with peculiar care when they again occur, in the hope of discovering the real cause of the change.

* Vol. iii. page 318.

VI. *Additional Account of the* New Hybrid Passifloras, *described in a former Communication* to the Horticultural Society. By* Joseph Sabine, *Esq. F. R. S. &c. Secretary.*

Read February 6, 1822.

When I laid before the Horticultural Society last autumn my account of the *Hybrid* between *Passiflora racemosa* and *Passiflora cærulea,* raised by Mr. Milne, at Fulham, I mentioned that, besides the single plant which had then blossomed, there were six others, derived from the same origin, one only of which seemed to correspond exactly with the plant then described, and that the five others would probably differ from it. This opinion has been found to be nearly correct; all the seven plants having been exposed to similar treatment in one of the stoves at the Fulham nursery, have blossomed this season, and the following statement is the result of an examination of the entire collection.

The plant described last year, and one other, are exactly similar; a third is like them in foliage and blossom, but is of more vigorous growth, and as it is not desirable to preserve such unimportant differences, it is intended to destroy the first and second plants, and to propagate from the third alone; this having its leaves generally with the appearance of being five lobed, will be called *Passiflora cæruleo-racemosa quinquelobata,* or *Milne's five-lobed Hybrid Passion-flower.*

* See Horticultural Transactions, Volume iv. page 258.

The fourth plant is unlike all the others, and will be more particularly described below, being uniformly three-lobed; it will be known as ***Passiflora cæruleo-racemosa trilobata,*** or ***Milne's three-lobed Hybrid Passion-flower.*** The remaining three are different from the others, but more similar in themselves, except that one of them grows more freely, and to greater extent than the other two; these last are therefore to be laid aside, and the stock which will be offered for sale will all be taken from the superior plant, which, from the circumstance of the blossoms at the termination of the branches appearing to grow in racemes, in the manner of the female parent, will be known as ***Passiflora cæruleo-racemosa racemosa,*** or ***Milne's racemose Hybrid Passion-flower.***

The Five-lobed Hybrid Passion-flower preserves very completely its conformity with the description given of it last year; the plant reserved as above noticed, is of more vigorous habit, and consequently will extend some considerable length when trained, but the original plant has also materially encreased its extent of growth since last year. The flowers of this variety are produced in great abundance, one blossom springing from the foot of each of the leaves along the whole extent of the new-formed shoot of the present year. The leaves are occasionally exactly three-lobed, but more generally have additional segments to the two upper lobes, and therefore seem to be five-lobed. Strong plants produce a few racemes of flowers from the sides of the old wood.

The Three-lobed Hybrid Passion flower is much stronger in its habit and growth than the others; its leaves are uniformly three-lobed, conforming in this more to its female parent; though of nearly similar consistence and appearance

to the preceding, the lobes are constantly both larger and broader, consequently the whole leaf seems superior in size; in this kind also there is less of glaucousness on the back of its leaves. Its blossoms come from the alæ of the leaves on the young wood, but the old wood, in addition, seems disposed more than in the other to throw out short racemes of flowers in various parts of its extent. The general character of the flower of this kind corresponds with that of the first variety grown last year, but it is larger, and has the following differences. *Bracteæ* flatter, more elongated, and tinged with purple. *Calyx,* when closed, red, but dull and not so light as the female parent; *Tube* similar, but more coloured; of the *Segments* when expanded, the inner surface is not purple, but a fine rosy carmine. The colour of the inside of the *Petals* is similar to the correspondent part of the calyx, but rather more intense. Of the *Crown,* the first and second series of rays, though spreading outwards, are slightly incurved; they are longer and stronger than those of the five-lobed plant, one third of them next the base is marked with purple, the remainder is white, and not spotted; the blunted tips are white, not purple; the third series of deep purple elongated stumps is similar, and the fourth series is similar in colour and direction; in the inside of the tube the elevated membrane is more conical than in that described last year. On the whole, both from the grandeur of the foliage and the finer colour of the calyx and petals, when expanded, this is the preferable variety, though the flower of the first has the advantage in the minute beauties of its crown.

The racemose Hybrid Passion flower will not grow to the extent of either of the others, but it is much more productive

of flowers, the joints of the stem being short, the leaves, and consequently the blossoms, occur more frequently in a given length, the termination of all the young branches bear racemes, or, what I believe is more exactly the case, are without leaves, and only produce stipulæ and flowers; the leaves are more decidedly five-lobed than the first, and are somewhat undulated, but the flowers in their general formation, though the purple colour predominates in the interior of the petals and calyx, have more resemblance to those of the second; the outer rays of the crown agree in appearance with those of the second sort, but the tips, instead of being white, are slightly coloured with lilac.

The differences between these three plants are not greater than may be found among seedlings of any one species, but such differences are of rare occurrence; for out of any number of plants of a species it does not often happen that a single variety is found differing in so many essential points either from a former variety, or from the parent, as is observed in those three plants apart; and yet it must be remembered, that these are selections from only seven seedlings. It therefore seems that if the practice of obtaining mule vegetables by artificial means continue, it will lead to such a multiplication of distinct individuals, that we shall have the catalogue of the Hybrids between any two species as extended as a list of Carnations or Tulips; and the gardener will be in danger of being lost or bewildered in the multitude of his own productions. In order to account for their differences, it has been suggested that the three Passion-flowers might have originated from the seeds of three different capsules; but I cannot conceive any reason why the seeds of two or more capsules of

the same plant, fecundated by the same male, should produce different plants, more than the seeds of one capsule so impregnated. In the ordinary course of vegetable economy, the seeds of any plant naturally fertilized, produce plants resembling each other, whether they come from one capsule or from several. The differences of the mules therefore must be the consequence of the artificial process of hybridizing, by which nature, though probably still acting under some regular law, which we cannot as yet explain, has been driven from the ordinary course of proceeding.

These hybrids, which I have described, have unquestionably such merit that they will be much sought after; if the origin of the first had not been known, it would probably have been treated as a new and distinct species, and from its singular beauty would have attracted much notice, while the others which succeeded it would perhaps have been considered as strongly characterized varieties of it, equally deserving of cultivation. But it will not always happen that similar productions will be equally fortunate. In my former communication I mentioned that Mr. Cattley had raised hybrids, between *Passiflora alata* and *Passiflora racemosa;* I have this season seen a blossom of one of them, it had much resemblance to the flower of its female parent, the first named plant, but was so much inferior to it, that, except as a matter of curiosity, the plant would not be preserved; Mr. Cattley has, however, others of the same race, which may prove more worthy of consideration.

I mentioned last year, that Mr. Milne had commenced the experiment of exposing his new Passiflora to the severity of our climate in the winter; it has so completely succeeded,

that the plant has continued in perfect health to the present time, and put forth its blossoms plentifully in September, and continued to flower through October and November. It was planted in a border under the south part of the green-house, and trained to a low wall below the upright lights of the building. Its flowers are superior in beauty to those produced in the stove, being of a much deeper and richer colour. Young plants of the two other varieties were turned out against a wall in the spring, and these also promise to endure the open air equally well. I have little doubt that they will all prove hardy, and that the three sorts will bear the same treatment as is usually applied to their male parent, the *Passiflora cærulea.*

VII. *On the Destruction of* Caterpillars on Fruit Trees. *By Mr.* John Sweet, *Corresponding Member of the Horticultural Society.*

Read November 6, 1821.

In May last I found the *Gooseberry Caterpillar* had begun its usual ravages on the leaves of a quarter of Gooseberries in my nursery near Bristol.

In the last and former season, among many other applications which had been tried in vain, lime had been used, but in a dry state; I resolved this year to try the effect of it in a different way; a bushel of stone lime was therefore slacked, and covered up for a few hours, to make it more soft and fine, it was then sifted through a mason's sieve, of the finest kind, which made it an almost impalpable powder. A man with a light garden engine was then directed to play water in different directions among the leaves, so that every part of the plants was wet; another man followed closely with a coal-box full of the fine lime-powder, scattering it with his hand, so as to cause it to appear like smoke, and to spread itself on the under as well as upper part of the leaves, so that not a single leaf was left untouched by it. In the course of the day I noticed that though some of the insects were still alive, they were much injured, and in the following day I could find none alive; some stragglers came on some time afterwards, but they were so few that I did not think it worth while to apply the lime a second time. After the

application the trees recovered their natural colour, and grew with their usual vigour.

A day should be chosen for the operation when little wind is stirring, but particularly when there is no rain: I think the absence of sun, or a cloudy day, preferable for the operation.

The earlier the remedy is applied after the insect is discovered, the better, and if it should be necessary to use it a second time, it must be done before the fruit changes colour, lest it be disfigured by the application of the lime. The lime need not be thrown on thick, but should be well divided with the hand in casting it, so that every part of each leaf be touched. In small gardens, where no engine is kept, a watering pot or a syringe may be used so as to wet every part of the tree.

Encouraged by my success on the Gooseberry bushes, I tried the lime against the black leach-like insect, or maggot,* which is so destructive to Thorns, Pear, and Cherry trees, and found that wherever the lime touched the animals, if they were wet, it destroyed them: it being difficult to water high standard trees, I took the opportunity very early in the morning, before the dew was evaporated, to apply the powder; slacking the lime over night to have it ready. The powder was tried after a shower of rain, but rain following, the operation did not answer; where however these insects can be got at they are more easily destroyed than those which infest the Gooseberry bushes. Pear trees against walls are often injured by these leach-like insects, but they can be watered and limed without difficulty.

I have tried lime-water thrown by the garden-engine,

* It is the larva of a dipterous insect, or two-winged fly. *Sec.*

the lime being just slacked in the water, making it warm; this answered tolerably well, but it required more lime, and rendered both the trees and the earth of the borders on which it fell unsightly.

A decoction of elder leaves mixed with soft soap was also applied; this had the effect of destroying the insects, but the preparation is more expensive, and the operation more troublesome, than that with lime-powder,

VIII. *A Sketch of the principal* Tropical Fruits *which are likely to be worth cultivating in England for the Dessert. By Mr.* John Lindley, *F. H. S. &c.*

Read December 18, 1821, and January 1, 1822.

The wish expressed by the Society that some account should be submitted to it of the various edible fruits which are produced in the warmer countries of the world, and which may possibly be brought to maturity in England, has induced me to offer the following sketch to the notice of its Members. On such a subject nothing new can be expected from one who has to derive the whole of his knowledge from the information of others; to some indeed, it is probable that all the materials he has been able to collect may appear too well known to be even amusing. Nevertheless it is possible that many of those who are likely to be particularly interested in the subject may in a great measure be ignorant of the sources from which the necessary information is to be derived; that yet more may be unable or unwilling to devote their time to the search after them; and finally, that several of the works I have cited are, to the generality of readers, inaccessible, either from their rarity, or from the languages in which they are written. For these reasons I feel persuaded that a collection into a single paper of such matter illustrative of the subject, as is dispersed through the writings of various authors, cannot be otherwise than useful to those for whom the Transactions of this

Society are chiefly destined; and if I should be so fortunate as to have contributed to the successful cultivation of a single good fruit, I shall be amply recompensed for the trouble I have taken.

To this day the cultivation of the fruits of Tropical countries has received a very slender share of attention in Europe. But a small proportion of them has been introduced to its gardens: and of those which have been brought to perfection the number is still more inconsiderable; yet the means of procuring them are generally so entirely within our reach, and the few attempts which have been made to cultivate them have so completely succeeded, that it is quite wonderful that they should have been prosecuted no further. Not to mention our *Pine Apples*, which are said to surpass in flavour those of the West Indies, the *Longan* is recorded in the Second Volume of the *Transactions* of this Society to have ripened its fruit at Mr. Knight's, of Lee Castle, near Kidderminster, in 1816; the fruit of the *Loquat* has repeatedly been perfected in England; at Wynnstay, the seat of Sir Watkin Williams Wynn, the *Banana* frequently produces its bunches of yellow fruit; and the *Chinese Guava* and *Yellow Jambu* regularly bring forth their crops in Mr. Cattley's conservatory at Barnet.

I, therefore, cannot refrain from expressing a hope that these instances of success will induce such Members as may have the opportunity and means, to persevere in attempts so happily begun, of adding the rich fruits of the East and West Indies to the delicacies of our desserts. Those who still feel doubtful as to the event, I must remind, that of all the fruits which adorn the garden even of an

English peasant at the present day, the Currant, the Gooseberry, and the Raspberry, are the only kinds which are not natives of a milder climate than our own. Every one knows that the cultivated Apple and Pear were introduced from Italy; and of the rest, the greater part were brought originally from the confines of the very countries where many of the fruits I am about to describe grow spontaneously. The natives too of the hotter regions of the world are too indolent to improve the riches they enjoy; but are contented with receiving them from the hand of nature, without an effort at ameliorating them. And this, I conceive, is an additional motive to stimulate the European to exertion; because it presents him with the prospect of possessing, through the arts of cultivation, as great a superiority in Tropical fruits generally, as he has already acquired in those to which he has taken the trouble of directing his attention.

In the succeeding observations I have not deemed it necessary to confine myself rigidly within the limits of the Tropics; but I have occasionally over-stepped them for the purpose of noticing the fruits of places which, although of a lower temperature than the inter-tropical countries, are yet so much hotter than our own, that considerable artificial heat is necessary for the cultivation of their productions here. Nuciferous trees, however, and Palms are universally omitted; the former, because they would more properly form part of a different memoir; and the latter, because they are not likely to bear their fruit in a country where so much artificial protection is indispensible. These considerations have also induced me to omit the *Bread-fruit*, which, in fact, is an object of domestic economy rather than a luxury for the table.

As a distribution of fruits according to the countries in which they are produced, seems the most convenient method for collectors, I have adopted that plan in preference to any other, which might have had a more scientific appearance, but which would, from that circumstance alone, have been less generally intelligible. Indeed every kind of botanical disquisition has been scrupulously avoided; as being equally foreign to my present purpose, and the general objects of the Society.

As a conclusion to these preliminary remarks, I may be allowed to meet an objection which may possibly be taken to the enthusiastic manner in which Europeans, who visit tropipical countries, are apt to describe their productions, by a remark of Baron HUMBOLDT's, which, I apprehend, no one will be disposed to contradict.—"There are certain spots," he observes, "in America, as in Europe, where different fruits attain their highest degree of perfection. The *Sapota Plum* (Achras Sapota) should be eaten at the island of Margaretta, or at Cumana; the *Chilimoyas,* (very different from the Custard Apple, and the Sweet Sop of the West India Islands) at Loxa, in Peru; the *Grenadillas,* or *Parchas,* at Carraccas; and the *Pine Apple* at Esmeralda, or in Cuba; to find no exaggeration in the praises which the first travellers bestowed on the excellence of the productions of the Torrid Zone."*

Before I proceed to enumerate the fruits which are peculiar to particular countries, either within or in the vicinity of the Tropics, it may be proper to speak of the few kinds, which appear now to have become common to

* Humboldt's Personal Narrative, Vol. v. page 504. English edition.

nearly all of them, or at least to the East and West Indies. I mean the *Plantain,* or *Banana,* the *Tamarind,* and the *Guava.*

The *Plantain* or *Banana,* with which as a tree no one can be unacquainted, is the principal fruit consumed by the inhabitants of the Torrid Zone; and from its nutritious qualities, and general use, may, whether used in a raw or dressed form, be regarded rather as a necessary article of food than as an occasional luxury.* In equinoctial Asia and America, in tropical Africa, in the Islands of the Atlantic and Pacific ocean, wherever the mean heat of the year exceeds 24 centigrade degrees (75° FAHRENHEIT), the Banana is one of the most interesting objects of cultivation for the subsistence of man. The fruit is produced from amongst the immense leaves in bunches weighing 30, 60 and 80 lbs.,† of the richest hues, and of the greatest diversity of form. It usually is long and narrow, of a pale yellow or dark red colour, with a yellow farinaceous flesh. But in form it varies to oblong and nearly spherical; and in colour it offers all the shades and variations of tints that the combination of yellow and red, in different proportions, can produce. Some sorts are said always to be of a bright green colour.‡ In general, the character of the fruit to an European palate is that of mild insipidity; some sorts are even so coarse as not to be edible without preparation. The greater number, however, are used in their raw state, and some varieties acquire by cultivation a very

* Crawfurd's History of the Indian Archipelago, Vol. i. page 410.

‡ Tussac Flore des Antilles, page 60.

‖ Rumphii Herbarium Amboinense, Vol. v. page 132, *Pisang Batu;* and Rheedii Hortus Malabaricus, Vol. i. page 20, *Cinga-Bála.*

exquisite flavour,* some of them surpassing the finest Pear.† In the better sorts the flesh is no harder than butter is in winter, and has much the colour of the finest yellow butter. It is of a delicate taste, and melts in the mouth like Marmalade.‡ To point out all the kinds that are cultivated in the East Indies alone would be as difficult as to describe the varieties of Apples and Pears in Europe; for the names vary according to the form, size, taste, and colour of the fruits.|| Sixteen principal kinds are described at length by Rumphius, from which all the others seem to have diverged. Of these the worst are *Pisang Swangi*, *P. Tando*, and *P. Gabba Gabba;* and the best are the round, soft, yellowish sorts, called *P. Medji* and *P. Radja.* Some cultivators at Batavia boast of having eighty sorts.§ Rheede distinguishes fourteen varieties by name, as natives of Malabar.⊥ In Sumatra alone twenty varieties are cultivated; among which the *Pisang Amas,* or small yellow Plantain, is esteemed the most delicate, and next to that the *P. Raja, P. Dĩngen,* and *P. Kallé.*** In the West Indies, Plantains appear to be even more extensively employed than in the Eastern world. The modes of eating them are various. The best sorts are served up raw at table as in the East Indies, and have been compared for flavour to an excellent Reinette Apple after its sweetness has been condensed by keeping through the winter. Sometimes they are baked in their skins, and then they taste like the best stewed Pears of Europe.

* Crawford, Vol. i. page 412. † Carey's Hortus Bengalensis, page 18.
‡ Dampier's Voyages, Vol. i. page 313. || Rumphius, Vol. v. page 126.
§ Ibid Vol. v. page 130-1-2. ⊥ Hortus Malabaricus, Vol. i. page 20.
** Marsden's History of Sumatra, 2nd edition, page 100.

They are also the principal ingredient in a variety of the richest dishes, particularly in that delicious composition called Mantégue,* which is made of slices of them fried in butter, and powdered over with fine sugar.† Of the many cultivated sorts, that called by the French *La Banane musquée* is considered the best. It is less than the others, but has a more delicate flavour.‡ There are fine uncoloured figures of the Plantain fruit in RHEEDE's *Hortus Malabaricus*, Vol. i. plates 12, 13, and 14; and coloured ones in TUSSAC's *Flore des Antilles*, plates 1 and 2. A deep red variety is represented in a Volume of drawings of Oriental Fruits in the Library of the Horticultural Society. It appears probable that there will be as little difficulty in ripening the fruit of the Plantain, as that of any tropical tree whatever. All hot climates seem equally congenial to its growth; and in Cuba it is even cultivated in situations where the thermometer descends to seven centesimal degrees, (45° FAHRENHEIT), and sometimes nearly to the freezing point. The hardiest variety is called *Camburi*, and is cultivated with success at Malaga.‖ It prefers a rich fat soil, for in sandy places it flowers abundantly, but produces no fruit.§

The *Banana* and the *Plantain* are usually considered the same by those who have occasion to speak of them. Although I conceive this to be a matter of no importance, it may nevertheless be proper to observe that the plants are different, and are even thought by some authors to be distinct species. Without staying to enquire whether the latter

* Mantéga is the Portuguese word for butter. † Tussac, page 61.
‡ Tussac, page 63. ‖ Humboldt's Personal Narrative, Vol. i. page 119.
§ Dampier's Voyages, Vol. i. page 313.

opinion be correct or not, it will be sufficient to mention that the *Banana,* (Musa sapientum), has a spotted stem, and fruit much smaller than the *Plantain,* (Musa paradisiaca), with a more mellow and less luscious, but yet more delicate taste.* I am informed by Mr. MARSDEN that in the East Indian Islands the word *Pisang* is always translated *Plantain,* and that the name of *Banana* is unknown.

Of the *Tamarind,* which is now so common an ornament of our hot-houses, besides the little bad sort described by BONTIUS, under the name of *Carandje,* or *Carandjang,*† and the one cultivated in the West Indies, which is usually called the common one, there are three kinds in the East Indies; viz. a sort which differs from the West Indian kind in the pods being much longer, with from six to twelve seeds; a second kind with sweet pulp, and a third kind with pink-coloured pulp.‡ In Sumatra the tree grows to the size of a large forest tree.

Of the *Guava* there are two distinct species, both of which form small straggling trees; the one is called Psidium pyriferum, or the *Pear-shaped,* and the other Psidium pomiferum, or the *Apple-shaped Guava.* They are common in both Indies, where they are cultivated for the sake of their fruit, which is eaten either raw or preserved. In the latter case the rind forms the Guava Marmalade, and the entire fruit the finest jelly in the world.|| In the East Indies, however, they are not so much esteemed as in the West Indies; where they are ranked among the best fruits of the Islands.

* Dampier's Voyages, Vol. i. page 316.

† Bontius Hist. Nat. et Medic. Indorum, lib. 6. cap. 4.

‡ Carey's Hortus Bengalensis, page 53.

|| Hughes's History of Barbadoes, page 132.

In Psidium pyriferum the leaves are elliptical and the flowers solitary. The fruit has the form and size of a middle-sized Pear; when ripe it is of a light straw colour, with a pale, soft, sweet pulp, containing a considerable number of small seeds. It is in perfection before it is quite ripe, and if gathered early in the morning, before the sun has shone upon it, the flavour is much brisker than when plucked at mid-day. It is frequently eaten with wine and sugar.* For figures, see the *Herbarium Amboinense,* Vol. i. plate 47, and the *Hortus Malabaricus,* Vol. iii. plate 34.

Psidium pomiferum differs from the preceding in having square shoots, and more lanceolate leaves. The fruit has always a dark grass green colour, and before maturity, is dashed with a tinge of red, which afterwards disappears; it is quite round, and not bigger than a large Plum. On the outside it is a little rugose and tuberculated. Its flesh is very firm, and the skin thick; but the flavour is more grateful than that of P. pyriferum. The tree always grows in the worst soils.† The pulp is sometimes mixed with cream by Europeans, to imitate Strawberries.‡ It is represented in the *Herbarium Amboinense,* Vol. i. plate 48, and in RHEEDE, Vol. iii. plate 35. An admirable coloured figure is among the Indian Drawings belonging to the Society.

In the West Indies, of each of the above kinds there are two varieties, the one with red, and the other with white fruit; those of the pear-shaped or perfumed species are the most highly esteemed.||

* Rumphius, Vol. i. page 140.

† Rumphius, Vol. i. page 142.

‡ Marsden, page 100.

|| Hughes, page 132.

AFRICA,

At its northern extremity, produces no indigenous fruit of importance, which is not common in Europe, except the *Lote tree,* (Rhamnus Lotus), of which notice will be taken presently. As we approach the Equator, and as the grand features of vegetation change, the fruits of the country assume a new appearance also. The Date, the Fig, and the Vine, give way to other races, of which the very names are unknown to Europeans. The only sort which resembles those of the more northern latitudes is that just mentioned, which grows in abundance over Fezzan, where it is called *Cornu.** M. Desfontaines describes the Tunisian plant as producing a berry of a sweetish taste ;† without bestowing any particular praises upon it. But the unfortunate Park, who found it very commonly in the Kaarta country, in Ludamar, and the northern parts of Bambarra, where it is known by the name of *Tomberong*, speaks of it as excellent. The berries, he says, are small and farinaceous, of a yellow colour, and delicious taste. They are highly esteemed by the natives, who convert them into a sort of bread, which resembles in colour and flavour the finest ginger-bread.‡ The plant has been many years an inhabitant of our green-houses ; and is figured in the *Mémoires de l'Académie Française* for 1788, plate 21.

The *Allobé,* which Burckhardt saw at Shendy, brought from Sennaar and Kordofan, was probably the fruit of the

* Lyon's Travels in Africa, page 274.

† Mémoires de l'Académie, 1788, page 443.—Flora Atlantica, Vol. i. page 200.

‡ Park's Travels, Vol. i. page 99.

Lote tree. He describes it in its dry state as of the size of a pigeon's egg, of a brownish yellow colour, with a large kernel enveloped in a thin fleshy substance which has a sub-acid and agreeable taste. It was also called *Tamr el berr,* or the Date of Soudan. The fruit called *Zakkoum,* at Cairo, which is brought from the plains of Ramle, in Palestine, appeared to him the same as the Allobé.*

The other fruits of tropical Africa are very imperfectly described; only two or three have been introduced into this country; and but few appear to be of much importance. Those of

Sierra Leone

are chiefly known from the report made by Dr. AFZELIUS to the African Society.

The *Cream Fruit* is the most worthy of notice; and must indeed be one of the finest fruits in the world. It is supposed to belong to the natural order of *Apocineæ,* and to be a genus not yet published.† Two of the fruit are always united, and hang down from the end of a small branch. When wounded they yield a quantity of fine white juice "resembling sugar, or the best milk." It is held in high estimation by the natives, who use it to allay their thirst. The tree which bears it is very lofty and abundant; particularly on the Island of Plantains.‡

The *Country Cherries* surpass all the fruits of Sierra Leone; they bear most resemblance to a fine Nectarine.||

* Burckhardt's Travels in Nubia, page 295.

† Brown in Appendix to Tuckey's Expedition, page 449.

‡ Afzelius in African Repository, 1794, page 173.

|| Ibid. page 172.

Of the *Country Plums*, which are of the size of an hazle-nut, with one or more kernels, there are many sorts which are known under the names of *Besabis, Drap, Abooke, Machai*, or *Machanter, Magint, Malinta, Wanibé*, and several others.*

There are also what are called by the Colonists, *Hog Plums*, which are not so large as European Plums, yellow, and rather insipid. The natives are very fond of them. The tree is like an Ash ;† perhaps a species of Spondias.

Country Figs are a fruit the size of an Apple, nearly round, and agreeable to the taste, when sufficiently ripe resembling an European Strawberry. The tree grows in the best soil in the woods.‡ Mr. Brown has ascertained it to belong to Dr. Afzelius's unpublished genus Sarcocephalus.||

The *Akee Tree* (Blighia sapida), is a large tree, with abruptly pinnated leaves. Its flowers are small and white, and grow in axillary panicles. The red fleshy capsule is about as large as a goose's egg, pear-shaped, and three-sided; it splits into three pieces when ripe, each of which contains a single seed, half immersed in a spongy arillus of considerable size. The latter is the part eaten, and it is said to have a most exquisite flavour.§ The tree belongs to the same natural order as the Rambutan, Litchi, and Longan; it has been many years in this country; and is well figured in Tussac's *Flore des Antilles*, plate 3.

* Afzelius in African Repository, page 171. † Ibid. ‡ Ibid.

|| Brown in Tuckey's Appendix, page 467.

§ König in Annals of Botany, Vol. ii. page 569, plates 16 and 17.

In Congo

are found several kinds of fruit, all of which appear to be different from those of Sierra Leone.

Conte is mentioned imperfectly by GIROLAMO; he describes it as a fruit of no beauty, but containing a white flesh with the taste of milk; the seed as large as a bean, and of so pleasant a flavour as to be often given to sick persons. The tree is frequently found wild among the mountains.*

The *Mabocche* tree bears a round orange-like fruit, with a hard rind. The seeds are enclosed in it, as in a Pomegranate, but with less regularity. Its freshness and slight acidity are very grateful, and rarely fail to remove that painful heat in the mouth which is experienced by such as are attacked by the fevers of the country.†

Gangi, said by Mr. BROWN to be a species of *Ximenia,* and perhaps the *Ogheghe* of LOPEZ,‡ is a shrub the fruit of which is yellow, the size of a Plum, and of a fragrant smell. The taste is acid but not disagreeable. The Portuguese missionaries use it in putrid fevers.||

Safu is a tree bearing a fruit the size of a small Plum. None of the scientific party which accompanied the expedition under Captain TUCKEY observed it ripe, but it was valued highly by the natives, and planted generally round their villages. It gives out a blackish stain,§ and is probably related to Bursera.**

* Viaggio del Padre Girolamo nel regno di Congo, dal Picardo, page 121.

† Ibid, page 124. ‡ Pigafetta, Hartwell's Translation, page 115.

|| Tuckey's Congo, page 276. Brown in Appendix, page 469.

§ Tuckey's Congo, page 324. Brown in Appendix, page 468, 474.

** Brown in Tuckey's Appendix, page 431.

The *Anona Senegalensis* is said by Mr. LOCKHART, the gardener employed in Captain TUCKEY's expedition, to produce a fruit of superior flavour to any of the cultivated Custard Apples, although inferior to them in size.*

Loango

produces a fruit described by the Abbé PROYART under the name of *Cazou.* It is as large as a Melon, and contains fifteen or twenty red and oblong kernels with the form and nearly the size of a pigeon's egg. They are of a farinaceous substance, and so nourishing that the Negroes never fail to carry some with them when they are upon a journey; a few will suffice for an entire day. Perhaps it may be a sort of Cacao, but it has not been ascertained.†

The Cape of Good Hope

does not produce a single species of fruit spontaneously which is fit for the table, except *Cissus Capensis.* That, however, I am informed by Mr. BURCHELL, is excellent, but with a different flavour from our Grapes. The berry of a species of *Euclea* is eaten, but is far from pleasant.

Madagascar,

if we may judge from the meagre praises bestowed upon its fruits by FLACOURT, bears none which are held in very high estimation by Europeans. There are several, nevertheless, of which it is proper to take notice. These are,

The *Voanato,* which is produced by a lofty tree growing on the coast. The flesh of the fruit when ripe is doughy,

* Brown in Tuckey's Appendix, page 467.

† Proyart, Histoire de Loango, page 26.

(*pâteuse*), and very nourishing. The inhabitants either eat it alone, or with milk and honey.*

Voutaca is a fruit as big as a quince, and as hard as a Gourd, or Calabash. It is full of seeds resembling Nux vomica, but smaller. The juice and the flesh are melting. When fully ripe it is agreeable, and gives out a grateful perfume; but if not ripe is dangerous and disagreeable.†

Voaucrome is a violet-coloured fruit, as small as a red Gooseberry, sweet, and very pleasant. It gives out a black and violet colour.‡

Azonualala is a little red fruit of a pleasant flavour, and, like the last, about the size of a red Gooseberry; but not so fleshy. It grows on a little bushy tree.‖

Alamotou is a spiny bush with leaves like those of a Plum tree. It bears a kind of black Plum, which has the flavour of that fruit when ripe. There is no stone, but in the room of it ten or twelve little pips.§ It is thought to be the Flacourtia Ramontchi, which was brought to this country in the year 1775.**

Among the fruits of the

WEST INDIA ISLANDS,

although they are neither so numerous, nor so beautiful as those of the Indian Archipelago, are some which can bear a comparison with the most exquisite productions of the Old World. To those who are disposed to attempt the cultivation of these, every inducement is offered, not only by trees of all the best of them already existing in our gardens, but

* Flacourt, Histoire de Madagascar, page 121. † Ibid.
‡ Ibid, page 122. ‖ Ibid, page 123. § Ibid, page 124.
** Aiton's Hortus Kewensis, 2nd Edition, Vol. v. page 405.

because their constitutions are by nature so robust, that they are but little affected by the artificial atmosphere in which, in their cultivated state, they are necessarily preserved.

Of these stand highest in estimation the various species of *Anona,* which are among the few trees which have in the lapse of time passed from the Western to the Eastern hemisphere.

The true *Custard Apple* (Anona reticulata) is produced by a small weakly branching tree. The leaves are ovate-lanceolate, with a long point, and the flowers yellowish green. The fruit is as large as a tennis ball, or somewhat less, of a dull brown colour, and divided, on its outside, into numerous irregular spaces, or areolæ, from which its name is derived. The flesh is soft, sweet, yellowish, or reddish, of the consistence and flavour of a custard.* It is generally cultivated along with the next species, under the collective name of Custard Apple, and it is figured in Rumphius, Vol. i. plate 45.

The *Sweetsop* (Anona squamosa) is a smaller tree than the last, in some parts of the East Indies not forming more than a bush. The leaves are oblong-lanceolate, with a shorter point than the last.† The fruit is of a greenish yellow colour, having its surface covered with scales, which give it the appearance of a young Pine cone. When ripe it is the size of an Artichoke; its skin is half an inch thick, containing an abundance of thick, sweet, luscious pulp, which is said to taste like clotted cream mixed with sugar. Its seeds are numerous, large, black, and hard. In Surinam it is called *Pomme de Cannelle,* and is very common in the gardens of

* Rumphius, Vol. i. page 136. Crawfurd, Vol. i. page 431.

† Rumphius, Vol. i. page 138.

Paramaribo.* RUMPHIUS says it smells and tastes of rose-water, and is so delicious that one scarcely tires of it.† It is well figured in a volume of Drawings of Oriental Fruits belonging to the Society, and a representation of it may be found in Vol. i. of the *Herbarium Amboinense,* plate 46.

The *Soursop* (Anona muricata), is the fruit of a moderately sized tree, which is common in every savannah of Jamaica, flowering in the spring. The leaves are ovate-lanceolate, and shining; the flowers large and yellow, with an unpleasant smell. The fruit is pyramidal, heavier than the largest Pear, irregular, and covered over with innocuous prickles, or small tubercles on the outside. The skin is of a yellowish green colour, and very thin; the pulp of a soft pithy substance, as white as milk, and of a sweet taste, mixed with a most agreeable acid. Among it are mixed the seeds, which resemble a large Apple-kernel. In Surinam it is called *Zurzack.*‡ Of this species there are two varieties, one with green, oblong, heart-shaped, curved fruit; the other with yellow spherical fruit.|| The former is figured in JACQUIN'S *Observationes Botanicæ,* Vol. i. plate 5, the latter in PLUMIER'S *Plantæ Americanæ,* plate 143, fig. 1.

Another species (Anona palustris), is called the *Alligator Apple,* the fruit of which is said to be a strong narcotic, although sweet scented, and of a flavour which is not disagreeable.§

All the preceding are now common in collections of plants in England.

* Stedman's Surinam, Vol. ii. page 324. † Rumphius, Vol. i. page 138.

‡ Stedman, Vol. ii. page 251.

|| De Candolle Reg. Vege. Syst. Nat. Vol. i. page 467.

§ Browne's Jamaica, page 256.

The *Avocado*, or *Alligator Pear* (Laurus Persea), is borne by a tree the size of an Apple tree. The leaves are oblong, and veiny, and the flowers of a yellowish green colour. The fruit is the size of a large Pear, and is considered one of the most delicious in the world. In the inside it is yellow, containing a kernel enclosed in a soft rind like the Chestnut. The pulp is pretty firm, and has a delicate rich flavour not unlike a Peach, but infinitely more grateful, although not so sweet. Sometimes it is called *Vegetable Marrow*, and is frequently eaten with pepper and salt; but the most usual mode is to mix the pulp with a little sugar and lime juice, on account of its richness.* There are three kinds, the red, the purple, and the green, of these the last is the best.† It is figured in SLOANE'S *Natural History of Jamaica*, plate 222.

The *Sappodilla Plum* (Achras Sapota), is the fruit of a large tree; and is by many considered only inferior to the Orange. The white, bell-shaped flowers are produced from among the tufted, shining, lanceolate leaves which clothe the ends of its shoots. In shape and size the fruit resembles a Bergamot Pear, in colour it is like the Medlar, and like it is eaten when it is beginning to decay. Although austere and milky before, it then becomes so sugared that many Europeans consider it too sweet. The fruit ought to be gathered a few days before it is ripe.‡ It is an old inhabitant of our stoves; and is excellently represented in TUSSAC'S *Flore des Antilles*, plate 5.

* Browne's Jamaica, page 214. Sloane, Vol. ii. page 131. Stedman, Vol. i. page 312.

† Hughes, page 130.

‡ Tussac Antilles, page 75. Hughes, page 33. Browne, page 200, plate 19, fig. 3. Sloane, Vol. ii. page 171.

|| Hughes, page 177.

The *Mammee Sapota,* or *Bully-berry* || (Achras mammosa), has a trunk three feet high. The leaves are obovate, blunt, very large, and clustered about the ends of the twigs. The flowers are cream coloured; the fruit oblong, tapering to both ends, two or three inches long, and in the middle as thick as a man's arm; it is covered with a rough cinnamon, or russet-coloured skin, having several irregular eminences and depressions upon it. The pulp is half or three-quarters of an inch thick, of the same colour as the skin, of a sweet and luscious taste. From its resemblance in colour to the Marmalade of Quinces, it is called Natural Marmalade. Within the pulp is one large stone. It is highly esteemed, eaten either alone, or, on account of its sweetness, with lemon juice.* There is a good figure of it in SLOANE, plate 218.

The *Mammee* (Mammea Americana), is a nearly round yellow fruit, standing on a short thick footstalk, and resembling a russet Apple of the largest size. The rind peels off as the bark of some trees does in the spring, and discovers the eatable part, which is of a pretty solid consistence, and of a fine yellow colour, about half an inch thick, and enclosing two or three stones with bitter kernels. The flesh is at first milky, but when ripe has a very delicious, sweetish acid taste, and in fragrance does not yield to any fruit known.† BROWNE, however, says the taste is too strong and gross for a weak stomach, and leaves a bitterness behind it, which continues for a considerable time on the palate.‡ The tree grows to the size of the largest oak; the leaves are oblong, obtuse, with very many fine, closely set, parallel veins.||

* Sloane, Vol. ii. page 324. † Stedman, Vol. ii. page 76. Hughes, page 133. Sloane, Vol. ii. page 123. ‡ Browne, page 249. || Sloane, Vol. ii. page 123.

SLOANE has given a good figure of it in his second volume, plate 217. It was introduced to this country in the year 1735.*

The *Anchovy Pear* (Grias cauliflora), is a beautiful middling sized tree, which grows in low moist ravines; or in places slightly covered with water.† The leaves are very large and handsome, of a thin texture, and obovate-lanceolate form. Along the trunk, two or three feet below the top, appear the sessile pale yellow, fragrant flowers, from which proceeds a large elliptical ovate drupe, in its inside of a fine yellow colour.‡ The pulp, which surrounds a great many flattish seeds, is of an agreeable sweet taste.|| It is figured in SLOANE, Vol. ii. plate 216.

The *Cherries* of this part of the world are the berries of different species of Malpighia; particularly of M. punicifolia and glabra.§ They are so called from their resemblance to common English red Cherries in size and form; their taste is pleasantly sub-acid, and they make very agreeable tarts, and excellent jellies.¶

The *Callimato* tree (Chrysobalanus Icaco), is a shrub seven or eight feet high. It requires a cool moist soil to bring its fruit to perfection.** The leaves are very long, and sharp-pointed; dark green on the upper and pale on the under side. Its Plums are black, longish, very clammy, and have one or sometimes two kernels in them. They are very sweet and agreeable.††

The *Star Apple* (Chrysophyllum Cainito), grows on a

* Aiton's Hortus Kewensis, 2nd edition, Vol. iii. page 297. † Browne, page 245.
‡ Sloane, Vol. ii. page 122. || Hughes, page 131. § Browne, page 230.
Sloane, Vol. ii. page 106. ¶ History of Jamaica, Vol. iii. page 790.
** Browne, page 250. †† Hughes, page 179.

moderately sized spreading tree with very slender flexile branches. The leaves are dark green on their upper surface, and are covered beneath with a remarkably satiny ferruginous pubescence. The flowers grow in small purplish bunches, and are succeeded by a round, fleshy, smooth fruit, resembling a large Apple. In the inside it is divided into ten cells, each containing a black shining rhomboidal seed, and surrounded by a white, or sometimes purplish, gelatinous pulp, traversed with milky veins, and of a very sweet agreeable flavour. In an unripe state the taste is said to be astringent and unpleasant.* When cut across, the seeds, which are regularly disposed round the axis of the fruit, present a stellate figure, from whence the name of Star Apple is derived. There is a smaller species, which produces the fruit called the *Damson Plum.*† The tree is very common in the hot-houses about London, and is exceedingly well represented in a fruit-bearing state in SLOANE's *Jamaica*, plate 229.

The *Plums* of these islands are the produce of various species of Spondias; the *Yellow Plum* of S. lutea, the *Hog* or *Spanish Plum* of S. Mombin, and the *Common Plum* of S. purpurea. They are all Ash-like small trees, with inconspicuous whitish flowers growing in bunches. Their fruit is not highly esteemed, although they are generally cultivated. For the most part their taste is sweetish and aromatic.‡ From the Spanish Plum an inebriating kind of wine is procured.‖ Most of them are strangers to our gardens.

In addition to the kinds I have mentioned already, the fruit of the Coccoloba uvifera or *Sea-side Grape*, of the *Garlick Pear*

* Sloane, Vol. ii. page 170. Browne, page 171.

† Browne, page 171.

‡ Sloane, Vol. ii. page 125, 127.

‖ Browne, page 228.

(Cratæva Tapia),* and of several sorts of Cactus, particularly C. triangularis, the *Strawberry Pear*, and C. repandus,† are occasionally produced at table; not to mention the various kinds of Grenadillas, described by Mr. SABINE in the *Transactions* of the Horticultural Society.§

The greater part of the fruits I have now enumerated are cultivated equally on

THE CONTINENT OF AMERICA,

and some of them are said to acquire there a degree of excellence at which they never arrive in the islands. Of the choicest of what may be considered peculiar to the continent, but the variety of which is very inconsiderable, I shall now offer a brief notice, divided for convenience into those of the countries lying to the north of the Equator, comprehending N. Grenada and Guiana, and those of the regions situated to the south of it, namely, Brazil, Peru, and part of Chili.

Guiana, &c.

The *Tapaculo* is a tree which abounds in the islands of the Lake of Valencia, where it is called by the Spaniards *Papaya de la Laguna.* It has a straighter trunk than the common Papaw, to which it is nearly related, but its fruit is not half so large, is perfectly spherical, without projecting ribs, and has a diameter of four or five inches. When cut it is full of seeds, but it has not the cavities which are constantly found in the common Papaw. The taste of the fruit is extremely sweet. M. HUMBOLDT doubts whether it may not be a variety

* Sloane, Vol. ii. page 169. † Browne, page 238.

§ Transactions of the Horticultural Society, Vol. iii. page 99.

of the Carica microcarpa, figured by JACQUIN in the *Hortus Schonbrunnensis,* Vol. iii. plate 309-310; but that species is said to have fruit no bigger than a Cherry.

The *Pinaou* (Anona punctata), forms a middle-sized tree, with large, long, pointed oval leaves, and solitary yellowish flowers. The fruit is about three inches thick, brown, oval, smooth, pointed, with little reticulations on its surface. The flesh is reddish, gritty, and filled with little seeds. It has a good flavour, and is eaten with pleasure.* A figure of it is in AUBLET'S *Plantes de la Guiane Française,* plate 247.

The *Pinaioua* (Anona longifolia) is, like the preceding, a native of French Guiana, and bears considerable resemblance to it in many respects, but the leaves are narrower, and the flowers smaller. The fruit is nearly round, as big as a Reinette Apple; its surface is divided by reticulated divisions; the skin is thin, and the red, delicate, viscous flesh is excellent, and very agreeable.† It is represented by AUBLET, in his plate 248.

Besides these, STEDMAN speaks of some other fruits which are found in Surinam, and which I am unable to refer to any I have previously mentioned. One of them he calls the *Marmalade Box;* it is about the size of a large Apple, rather oval, and all covered with down. In the beginning the fruit is green, but when ripe becomes brown, and opens in halves, like a Walnut. The pulp is like that of a Medlar, being a sweet brown substance adhering to large kernels, and is sucked by the inhabitants with great avidity.‡

A second he calls *Monpe,* a kind of wild Plum tree. The

* Aublet, Plantes de la Guiane Française, Vol. i. page 614.

† Ibid, Vol. i. page 615. ‡ Stedman, Vol. ii. page 330.

fruit of which is yellow, oblong, and small, the stone large, and the pulp thin, and though of a sharp acid has an agreeable flavour.* Possibly it is a species of Spondias.

Under the name of *Medlars* he speaks of a fruit of a crimson colour, with a taste very like that of Strawberries. It grows on a large green shrub, and is cultivated in many gardens at Paramaribo.†

Brazil, Peru, &c.

The fruit most highly esteemed by the inhabitants of these countries is a sort of Custard Apple, which they call *Cherimoyer* (Anona Cherimolia). It is a tree about twelve feet high; the leaves are oval, pointed at both ends; the flowers solitary, very fragrant, of a greenish white colour, and the fruit somewhat heart-shaped, with a scaly appearance on the outside; when ripe it is grayish brown, or black. The flesh is white, and sweet, mixed with several seeds of the colour of coffee. The Creoles think this fruit the best of the country;‡ Baron Humboldt speaks of it in terms of high praise; and his account is completely confirmed by the testimony of many officers who have been in the South American service; but Feuillée says, one European Pear, or Plum, is worth all the Cherimoyers of Peru. The latter author has figured it in his *Journal des Observations, &c.* iii. t. 17. It is said to be the same as the plant known in our gardens under the name of *Anona tripetala,* and which has been referred to it by M. De Candolle.

The *Grenadillas,* called *Parchas* by the Spaniards,‖ are very commonly eaten, especially in Brazil; and are highly

* Stedman, Vol. ii. page 173. † Ibid.

‡ Feuilleé, Journal des Observations faites sur les côtes orientales de l'Amérique Méridionale, Vol. iii. page 24.

‖ Humboldt's Personal Narrative, Vol. v. page 129.

esteemed for their pleasant cooling properties. It is impossible for any but those who have been upon the spot to ascertain what particular kinds are cultivated, or to which botanical species those which have been described are to be referred. It is probable that in common language all which are served up at table are confounded under the name of Grenadillas, and that many writers have not been aware of the fruits being produced by different species of Passiflora. Spoken of collectively, their taste is said to be a pleasant sweetish acid, with an agreeable smell between a Melon and a Strawberry.* PISO, however, describes and figures four principal kinds under the name of *Murucuja*, none of which, I believe, have been taken up by botanical writers. Except the fourth, they appear to be altogether different from the West Indian kinds, to Mr. SABINE's account of which I have already referred.

PISO's first sort of Murucuja has three or five-lobed leaves, and purplish blue flowers. The fruit is round, inclining to oval, and is larger than an European Pear. The smell and taste are aromatic, and so pleasant that nothing exceeds them. The seeds are black, oblong and enveloped in a sweet tenacious mucilage. The best variety of it is that with fruit which is quite round, smooth, bright green, and speckled with white spots; when ripe, yellow, with a thick tough skin, and a beautiful deep yellow pulp of an highly agreeable vinous flavour. He observes that since the Peruvian writers speak of their kinds as insipid, he concludes they are different from his.†

His second kind has a flower like the first, but with a

* Fab. Columna in Nardi de reb. Hisp. annot. pag. 890.

† Piso Historia Naturalis Braziliæ, lib. 4. c. 60. cum fig.

less spreading crown. The fruit is as big as a common Apple, with a thick yellow skin and a succulent pulp with a pleasant vinous acid taste, and which stains the tongue yellow.

The third sort which he mentions has constantly five-lobed leaves, but the fruit and flowers resemble the foregoing. The former, when immature, is shining and of a yellowish green, when ripe, of a Lemon colour, and when pressed by the finger, dissolves with a crack. The fruit is not so good as that of the other kinds.

The fourth species which he describes is probably either ***Passiflora alata*** or ***P. quadrangularis.***

The *Achocõn* of the Peruvians (Leonia glycycarpa), is a large tree with alternate oblong, acuminate, coriaceous leaves and yellow flowers, growing in loose panicles. The fruit is the size of a Peach, rough, yellow, and filled with sweet, soft pulp of the same colour. It is in much esteem among the natives.* A figure of it may be found in the *Flora Peruviana* of Ruiz and Pavon, Vol. iii. plate 222.

Queule, or ***Keule*** (Gomortega nitida), is a large evergreen tree, and not uncommon in the woods of Chili. The fruit is the size of a small Peach, and like it consists of a fleshy substance enveloping a stone. The eatable part is yellow, not very juicy, but of a most excellent and grateful taste.† The fruit is represented in the ***Prodromus*** of the ***Flora Peruviana,*** plate 10.

The following are also known, and occasionally employed as fruits for the dessert; they appear however to be of little importance, and not deserving a particular description;

* Flora Peruviana, Vol. iii. page 69. † Floræ Peruvianæ systema, page 109.

viz: *Psidium phylliroides,* the fruit of which is used for refreshing lemonades.* *Achras Cainito* and *Achras Lucuma,*† *Aristotelia Macqui,*‡ *Porcelia nitidifolia,*‖ and *Lardizabalia biternata.*§

In describing such of the fruits of Asia as are included in my plan, I shall separate them into those of the *Indian Archipelago,* of the *Continent of India,* and of *China,* including *Japan.*

THE INDIAN ARCHIPELAGO

produces, as a modern writer has observed, "by far the most curious, the richest, and the most extensive varieties of fruits, of any portion of the globe. The nature of some of the finest is so peculiar that all attempts to cultivate them even in parallel climates, have proved unsuccessful."** The latter part of this remark is, I apprehend, chiefly intended to apply to the *Durian* and *Mangustin.* Without staying, however, to consider the possibility or impossibility of cultivating those fruits, which is a question that future experience alone will decide, I shall proceed to offer such an account of them and others of the same latitudes as the descriptions of travellers have enabled me to collect. The greater number of the fruits of the Indian islands grow wild; and it is but a very careless cultivation that is bestowed upon any. The trees of most of them are planted in a straggling manner about villages. They probably do not require the richest soils; for fine fruit and abundant crops are obtained from lands considered unfit for raising grain, or even farinaceous roots.††

* Humboldt's Personal Narrative, Vol. v. page 140.

† Flora Peruviana, Vol. iii. plates 239 and 240.

‡ Floræ Peruvianæ systema, page 126. ‖ Ibid, page 144.

§ Ibid. page 287. ** Crawfurd, Vol. i. page 415. †† Ibid.

Of all known fruits the *Mangustin* (Garcinia Mangostana) is placed by almost universal consent the highest in rank. It is the pride of the countries to which it exclusively belongs; and seems to meet the approbation of persons of the greatest diversity of taste in other matters. In shape and size the fruit resembles a middle-sized Apple; but has a thick dark purple or brownish red rind, which is hard on the outside but soft and succulent within. This encloses three or four cloves consisting of a soft semi-transparent snow-white pulp, which is the part eaten, or rather sucked, for it dissolves in the mouth. Its characteristic quality is extreme richness of flavour, without being luscious or cloying; and it may be eaten in any moderate quantity without danger of surfeit or other unpleasant effects.* An intelligent traveller, speaking of the Mangustin, says that he and his companions were anxious to carry away with them some precise expression of its flavour, but after satisfying themselves, that it partook of the compound taste of the Pine Apple and the Peach they were obliged to confess that it had many other equally good but utterly inexpressible flavours.† A branch is represented in Mr. Marsden's *History of Sumatra,* plate 5, and there is a good coloured figure of it in a volume of Oriental Drawings belonging to the Society.

A wild variety (*Mangostana celebica* of Rumphius, Vol. i. plate 44) is found in the woods of Java and Celebes, but the true Mangustin appears to be a native of the Western portion of the Archipelago only.‡

The *Durian* (Durio Zibethinus), in point of excellence is

* Marsden, page 97. Dampier, Vol. ii. page 125. Crawfurd, Vol. i. page 417.

† Abel's China, page 277. ‡ Crawfurd, Vol. i. page 418.

considered next to the Mangustin, notwithstanding its peculiar offensive odour, which creates in strangers at first a violent aversion to it, and which is said to arise from sulphuretted hydrogen.* The tree which bears it is full of boughs, and is about the size of a Pear tree. In external appearance the fruit has some resemblance to the Bread-fruit, the outside being thickly covered with tubercles in a similar manner. As it ripens it assumes a yellowish colour, and consists of five longitudinal cells each containing from one to four large seeds as big as pigeons eggs, enveloped in a rich white pulp, itself covered with a thin pellicle. Though extremely rich and nutritious, and one might almost say, partaking more of an animal than vegetable nature, it never cloys nor palls upon the appetite, so that a taste for it rather increases than diminishes.† One traveller compares it for colour and taste to an excellent meat much used in Spain called *Mangiar Blanco,* which is made of hen's flesh distilled with vinegar.‡ The large seeds when roasted resemble Chestnuts in flavour. The natives and those who fall into their habits are passionately addicted to the fruit, and during the time of its continuing in season live almost wholly upon its luscious and cream-like flesh.‖ It opens at the top when it is ripe, and it must be eaten in its prime, for it will not keep above a day or two before it putrifies and turns black or of a dark colour, and then it is not good.§ RUMPHIUS describes three principal sorts :

The *Borneo Durian,* which is often as big as a water-

* Abel's China, page 277.

† Crawfurd, Vol. i. page 419.

‡ Van Linschoten, Voyages into the East and West Indies, chap. 57.

‖ Marsden, page 98.

§ Dampier, Vol. i. page 319.

pot, and a load for a man, but sometimes smaller. It grows in Borneo, about the town of that name.

Durian Cassomba, which is thought more delicate than the common kind, and comprises the smaller cultivated sorts. Of these some are oblong, which are considered the best, especially if the skin be of an orange colour, and the tubercles few, obtuse, and distant from each other. The fruit has only one or two kernels in each cell, and is very full of pulp. Some of this sort have fruit like the common kind, but the rind is deep yellow, and reddish inside. The *Durian Manka* may be referred to this section; it has a soft flesh to the kernel, and is less esteemed than the others.

A sort which is rounder and smaller than the others, has a greater number of kernels, and a more watery flesh. A variety of this is the *Durian Babi* of Banda, which is the smallest of all the kinds, and has little prickles on the tubercles. It contains many little kernels, but has a firmer and more abundant flesh in proportion to its size, than the commonest kind; on which account it is reckoned better.

Many other varieties are cultivated in Banda, but they all may be reduced to the three foregoing heads.* The Durian does not appear to have been discovered in its wild state, but when cultivated grows readily enough in ordinary soils. It is the highest priced of all the fruits of the Archipelago, for one Durian costs more than a dozen Pine Apples.† It is figured in Rumphius, Vol. i. plate 29, and there are drawings of it in a volume of Oriental Fruits belonging to the Society.

Of the *Jack* fruit (Artocarpus integrifolia) there are two sorts, the common *Jack,* or *Nangka,* and the *Chămpădak,* or

* Rumphius, Vol. i. page 100. † Crawfurd, Vol. i. page 421.

Chapada. The Nangka is a coarse fruit related to the Bread-fruit, which it also resembles in figure, and is not much in esteem among Europeans on account of its strong taste. It is, however, well suited to the native palate, and is consumed even in greater quantity than the *Banana.* Sometimes it grows to an enormous size, weighing in some instances fifty or sixty pounds.* RUMPHIUS has represented it in Vol. i. plate 30, and there is a figure of it among the Oriental Drawings of the Society.

The *Chămpădak* in appearance is the same as the Nangka, but is much smaller, more slender in its form, and of a more oblong shape. It has also a sweeter and more delicate flavour.† The outer coat is rough, containing a number of seeds or kernels, which when roasted have the taste of Chestnuts; they are enclosed in a fleshy somewhat farinaceous substance, of a rich, and, as some say, to strangers too strong smell and flavour, but which gains upon the palate.‡ The flesh is more yellow than in the Nangka, is more juicy, and resembles ripe Grapes or Strawberries. The fruit which ripens on the tree has an exceedingly delicate flavour, with a grateful acid, but if gathered before maturity it becomes soft and loses much of its freshness.‖ By the natives it is much more valued than the Nangka, and bears a higher price. It does not thrive in the close gardens which surround the Indian villages, but requires sunny solitary situations.§ It is figured by RUMPHIUS, Vol. i. plate 31, and in a Volume of the Society's Oriental Drawings. This I take to be what VAN LINSCHOTEN calls *Barca,* of which he says the taste is various, "sometimes

* Marsden, page 98. Crawfurd, Vol. i. page 422.

† Crawfurd, Vol. i. page 423.

‡ Marsden, page 99.

‖ Rumphius, Vol. i. page 108.

§ Crawfurd, Vol. i. page 423.

it tasteth like a Melon, sometimes like a Peach, and somewhat pleasanter, (but in taste it is most like unto a Peach), sometimes like an honey-comb, sometimes like a Citron."*

The *Lanseh* (Lansium domesticum), grows upon rather a lofty tree, with pinnated, oblong, alternate, pointed leaves. The flowers are greenish, in clustered racemes, and are succeeded by bunches of oval yellowish fruit the size of a pigeon's egg. Being deprived of its thin outer coat it divides into five cloves, of which the kernels are covered with a fleshy semi-transparent pulp of a sub-acid agreeable taste. It is known when the fruit is perfectly ripe by a few black spots appearing on its surface and by its yielding to the pressure of the fingers.† The skin contains a clammy milky juice, extremely bitter, and, if not stripped with care, apt to communicate its quality to the pulp. *Chupak, Ayer-Ayer,* and *Rambé* are said to be species or varieties of it;‡ but, if we may judge from Mr. Marsden's figure, in his *History of Sumatra,* plate 8, and from drawings in the possession of the Society, the latter can scarcely belong to the same genus as the Lanseh, nor even to the same natural order. There is also a sort called *Dukuh,* which is round, not oblong, and much superior to the others, indeed next to the Mangustin and Durian is esteemed by the natives the finest of their fruits. Europeans consider it the second in rank of all the indigenous fruits.|| A figure of the true Lanseh on a reduced scale, is given by Mr. Marsden in his *History of Sumatra,* plate 7.

Several species of *Jambu* are cultivated for the sake of their

* Van Linschoten, chapter 50.

† Rumphius, Vol. i. page 157.

‡ Marsden, page 101.

|| Barrow, Cochinchina, page 186. Crawfurd, Vol. i. page 432.

fruit. That most esteemed for the table, and the largest, is the ***Jambu Merah*** or ***Kling***, (Eugenia malaccensis.) This resembles in shape a Pear; the outer skin, which is very fine, is tinged with a deep and beautiful red, the inside being perfectly white. Nearly the whole substance is edible, and when properly ripened is delicious; but when otherwise is spongy, and indigestible. In smell and even in taste it partakes much of the flavour of the Rose,* on which account it is frequently called ***Rose Apple.*** This I suppose to be the ***Jambosa nigra*** figured by RUMPHIUS, Vol. i. plate 38, and in the Oriental Drawings of the Society's Library. There is a sort with pale rose-coloured fruit, which is very highly esteemed and more generally cultivated than the last,† figured by RUMPHIUS under the name of ***Jambosa domestica,*** Vol. i. plate 37, and in a volume of the Society's Oriental Drawings. The same author speaks of two other Jambus, which he refers to the last mentioned kind; the one of a smaller size containing a large kernel, whitish outside, with a little red on the sides, less sweet, and with not so much of the Rose flavour; the other about as big as a young Cocoa-nut, called ***Jambu Cloncong*** in Macassar, quite white, and so very finely tasted as to be preserved for the king of the country only.‡

Jambu ayer-mawar, or ***Rose-water Jambu*** (Eugenia aquea), is in appearance more beautiful than the last, but far inferior to it in flavour, although more highly perfumed with Rose. Its colour is of the most delicate and transparent pink mixed with white.‖ The fruit grows in clusters, in size is much smaller than the last, in form pear-shaped with a strong

* Marsden, page 99. † Crawfurd, Vol. i. page 429. Rumphius, Vol. i. page 121.
‡ Rumphius, Vol. i. page 122. ‖ Marsden, page 99. Rumphius, Vol. i. page 126.

contraction about its middle. Nothing can be more beautiful than the blossoms both of this and Jambu Kling, the numerous stamina of which are of the most brilliant pink colour. It is indifferently figured by RUMPHIUS, Vol. i. plate 38, fig. 2, and very well among the Society's Oriental Drawings. Among the unpublished drawings of Java plants, (No. 68,) preserved in the Banksian Herbarium, the fruit is represented as quite white.

Jambu utan puti (Eugenia Jambos) has leaves much like those of Jambu Kling, but its flowers are white and larger. The fruit is as large as a hen's egg, with the colour and flavour when fresh of a ripe Apricot. It is figured in RUMPHIUS, Vol. i. plate 39, and is common in the gardens of this country. Mr. CATTLEY has a plant which regularly yields him an abundance of fine fruit.

The famous *Mango* (Mangifera Indica), which, though only known to residents in Europe as an excellent pickle, forms one of the chief delicacies of an Indian dessert, and is even said by some to be inferior only to the Mangustin, is the produce of a large tree like a Walnut, with long lanceolate leaves and upright pyramidal bunches of small whitish flowers. The fruit when ripe is shaped like a short thick Cucumber; generally of the size of a goose's egg; its colour at first is bright green, but it afterward changes to orange on one side, or all over, frequently, however, continuing always green. Under a thin skin, which is stripped off like that of a Peach, is a tender fibrous flesh, so exceedingly juicy and delicate, that every part of it may be sucked up. When not ripe it is sourish, but being fully mature has so gratefully sweet a flavour that nothing can excel it; always, however, with a slight degree of acidity. The fruit is not perfectly ripe till

it emits a pleasant faint smell; in a state of decay it has a strong taste of turpentine. In the inside is a large stone, to which the flesh always firmly adheres. Such is the character of the commonest kinds; those which grow in Amboyna and Banda attain the greatest size, and those of Java are the smallest, but entirely yellow and very sweet; the Mangoes of Mazagong, a town of Hindostan, are said to be the finest, especially those which grow on one particularly large tree, which being the property of Government, has a guard placed over it during the fruit season. The President has in cultivation a kind which he received from Kew under the name of the *Alphonso Mango;* obtained, as was stated to him, from the vicinity of Bombay, where it was highly esteemed. In the number of its varieties this plant almost rivals the Plantain. Forty varieties are known in Java,* but RUMPHIUS reduces those of the Indian islands to five principal heads: the common Mango above described, and four others.

1. *Manga Dodol,* or *Mango Calappa,* is the largest variety, sometimes being as big as an infant's head, and weighing more than two pounds. Its flesh is not yellow in the inside, but of a pale hue; it is less fibrous than the common sort, with a smaller stone; the taste is sweet with a little acidity. In Goa, it is called *Mango Barera,* and grows to the size of a middling shaddock. Sometimes the fruit acquires a reddish colour, as in the sort named *Tsjeribon* (after a place so called) in Java.

2. *Manga Dading, or M. Daki;* of this the fruit is oblong, rounder than the others, and green even when fully ripe. Its flesh is pale red without fibres, and its taste is fainter than that of the other varieties. It is not a common kind.

* Raffles's History of Java, Vol. i. page 36.

3. ***Tappa Rawa Rawa,*** called ***Taipa Pali Pali*** in Macassar, has nearly the form and size of a duck's egg, or is even smaller, and has no curve at the extremity. When ripe it is deep brown or blackish, and has a red fibrous flesh with a large stone, and a smoky taste and smell. In an unripe state it is exceedingly sour. Its leaves are smaller and narrower than those of the common sort.

4. ***Manga Buzjo,*** or ***Budjo,*** has the smallest fruit of all, it not being bigger than a hen's egg; in other respects it is not very dissimilar to the last. At first it is green, afterwards it becomes yellow, and when ripe changes to a light chestnut colour; the flesh is brownish or dull red, and the juice of the unripe fruit so austere that it sets the teeth on edge. It must not, therefore, be eaten till it has become thoroughly ripe, and even then it should be gathered a few days previously. The flesh is by no means abundant, and it separates from the stone more easily than in any of the other kinds. On account of their rarity, the two last are offered as presents to the people of quality in Macassar.* The Mango tree has been in this country many years, and our President has lately directed his attention to its cultivation. Several varieties are among the Oriental Drawings of the Society.

The ***Manga Utan*** of the Malays, and ***Way Way*** and ***Ouw*** of the Amboynese (Mangifera sylvestris), has smaller leaves than the common Mango, and flowers in looser bunches. There are two kinds, one with large and the other with small fruit; but neither is in any estimation.† They are figured in Rumphius, Vol. i. plates 26 and 27.

* Rumphius, Vol. i. page 93. † Ibid. page 97.

The *Blimbing* (Averrhoa Carambola), is produced by a bush with straggling branches, pinnated leaves, and purple flowers growing in bunches. The form of the fruit is oblong, with five prominent angles; its skin is thin, green at first, and yellowish afterwards. The flesh is soft, and exceedingly juicy, like a Plum, with a gratefully acid flavour. It is wholesome and very refreshing, particularly in hot weather. The fruit in Hindostan and Ceylon sometimes becomes as big as two fists.* In Sumatra there are two sorts called *Penjuru* and *Besi*, which are chiefly used in cookery where a strong acid is required.† In Bengal a sweet and an acid kind are cultivated.‡ The Blimbing is represented in RUMPHIUS, Vol. i. plate 35, and there are several figures of it among the Oriental Drawings of the Society.

The *Cheremi* (Averrhoa acida) is nearly related to the Blimbing Besi; but the fruit is smaller, of an irregular shape, growing in clusters close to the branch; and containing each a single hard nut or stone. It is a common substitute for our acid fruit in tarts.|| For a figure see RUMPHIUS, Vol. i. plate 36.

The *Rambutan* (Nephelium lappaceum), is about the size of a pigeon's egg, consisting of a shining red covering, defended by soft spines or coarse hairs. The part eaten is a gelatinous and semi-transparent rich sub-acid pulp surrounding the kernel.§ Several figures of it exist among the Society's Oriental Drawings; it is also represented by Mr. MARSDEN, plate 6.

* Rumphius, Vol. i. page 116.

† Marsden, page 102.

‡ Carey's Hortus Bengalensis, page 34.

|| Marsden, page 102.

§ Marsden, page 101. Crawfurd, Vol. i. page 432.

The *Poolasang* is a large variety of the last; it is thought the better of the two, and wants the hairy processes on its skin.*

Tomi-tomi (Flacourtia inermis) is cultivated in the Moluccas for its pleasant edible fruit. It is a little tree bearing a berry of a reddish purple colour, the size of a small Cherry, and with five angles.† It is figured in ROXBURGH's *Coromandel Plants*, plate 222.

Xanthochymus dulcis, is also a native of the Molucca islands, and forms a small tree with opposite oblong leaves, and axillary flowers of a round shape, and greenish yellow colour. The berry is the size of an Apple, of a roundish oval figure, and bright yellow hue when ripe. The seeds are enveloped in edible pulp of a darker colour than the skin and of a pleasant taste.‡ It is figured in ROXBURGH, Vol. iii. plate 270.

Sandoricum indicum is another large tree found in the Moluccas, with ternate leaves growing on a long stalk. The flowers are small and yellow, and appear in small bunches from the axillæ of the leaves. The fruit is globular, the size of a small Orange, and somewhat three-sided. Its colour is dull yellow, and it is filled with a firm fleshy agreeable acid pulp, which forms a thick covering round the gelatinous substance in which the seeds are lodged.‖ RUMPHIUS says it is chiefly used for culinary purposes.§ It is represented in ROXBURGH, Vol. iii. plate 361, and among the Oriental Drawings of the Society.

* Barrow, Cochinchina, page 186. Abel, page 277.

† Roxburgh's Plants of the Coast of Coromandel, Vol. iii. page 16.

‡ Ibid. page 66.

‖ Ibid. page 57

§ Rumphius, Vol. i. page 168.

Besides the preceding, which may be considered the best fruits of the East India Islands, there are a few others of inferior degrees of goodness, chiefly found in a wild state, but some of which boast a fine flavour, and probably might be improved by culture.* Mr. MARSDEN mentions as natives of Sumatra, *Buah Kandis* (a sort of Garcinia), *Sikaduduk* (a Melastoma), *Buah Malaka* (Phyllanthus Emblica), *Rukam* (Carissa spinarum), *Bañgkuda* or *Mañgkuda* (Morinda citrifolia), and *Kitapan* (Callicarpa japonica). In Amboyna a sort of Pomegranate is cultivated, with white granules,† and several fine sorts of Jujube some of which are as large as a middle-sized Apple, and very juicy, vinous, and sweet.‡

Of the fruits just described a considerable part are also brought to great perfection upon the

CONTINENT OF INDIA,

but as it is unnecessary to recur to them again, I shall now confine myself to such as are not found in the islands, and the greater part of which are but little known.

The *Maredoo* of the Telingas (Ægle Marmelos), is a large tree, with prickly branches, ternate leaves, and white branches of axillary flowers. The fruit is of a light brown colour on the outside, and internally is divided into from ten to fifteen cells; its size is about that of a China Orange, and besides the seeds, it contains a large quantity of exceedingly tenacious transparent gluten.‖ When ripe its taste is delicious, and its fragrance so exquisite as to be compared by some to the

* Marsden, page 103.

‖ Rumphius, Vol. ii. page 117.

† Rumphius. Vol. ii. page 94.

‡ Roxburgh, Vol. ii. page 23.

Wall-flower.* Sir WILLIAM JONES has described it in the *Asiatic Researches* under the name of *Bilva* or *Malura.* It is also called *Sríp'hala,* because it sprang, say the Indian poets, from the milk of Srí, the Goddess of Abundance.† RUMPHIUS says it is best roasted in ashes, by which it is deprived of a considerable portion of the insipid mucous matter which it contains.‡ The people of Surat send the fruits as a present to the king of Macassar.‖ There is a good figure of it in ROXBURGH's *Plants of the Coast of Coromandel,* plate 143.

The *Yellanga* of the Telingas (Feronia elephantum), the Elephant or Wood-apple tree of the English, is a moderately sized tree with pinnate leaves and prickly branches. The flowers are like those of the Maredoo, but smaller. The fruit is the size of a large Apple, and covered with a hard, gray, scabrous, woody rind. The seeds are attached to five receptacles running up the inside of the cavity, and forming, by the approximation of their inner angles, a stellate appearance when the fruit is cut across. The pulp is universally eaten on the coast of Coromandel.§ ROXBURGH has given a figure of it at plate 141.

Latti Am (Willughbeia edulis) is a name given by the inhabitants of Chittagong, Silhet, &c. to a rambling climbing plant with opposite oblong-lanceolate leaves, and little white flowers growing from their axillæ. The fruit is of a dark orange colour, the size of a large Lemon, and filled with a soft yellowish pulp in which are immersed a few seeds the size

* Bontius, lib. 6. cap. 8.

‡ Rumphius, Vol. i. page 198.

§ Roxburgh, Vol. ii. page 22.

† Asiatic Researches, Vol. ii. page 349.

‖ Ibid.

of a horse-bean. It is thought good by the natives of the countries where it grows.* See ROXBURGH's *Coromandel Plants*, plate 280, for a figure.

Iwara Mamady of the Telingas (Xanthochymus pictorius) bears a round smooth Apple of a middling size, which when ripe is of a beautiful yellow colour. The seeds are from one to four, large, oblong, and immersed in pulp. The fruit is very handsome, and in taste little inferior to many of our Apples in this country. It is nearly related to the Mangustin, and ROXBURGH thinks there is no doubt it would prove a delicious fruit if ameliorated by culture.† A few plants are in the gardens about London; and a branch with fruit is figured in the *Coromandel Plants*, plate 196. Can it be the same as the *Birchi* or *Birci?* which is a name given by the people of Camboya to a fruit in size about that of a Lemon, and of a delicious flavour.‡ It is so described by MARCO POLO; but, as Mr. MARSDEN observes, without a more particular account it is impossible to ascertain what is intended with precision. In a country where the Mangustin should be found it might be thought to merit such especial notice, but we are not informed of that exquisite fruit being a native of Camboya.||

Caraunda of the Bengalese (Carissa Carandas), is a large shrub very common on the coast of Coromandel, growing in wild woody uncultivated parts. Its berry is the size of a small Plum and contains eight seeds. When ripe it is black and pleasant to the taste. Just before maturity it is employed

* Roxburgh, Vol. iii. page 77.

† Ibid. Vol. ii. page 51.

‡ Marco Polo, by Marsden, page 594.

|| Ibid. page 596.

to make conserves of various kinds, and also to pickle, for which purpose it is superior to every other fruit in the country, the Mango itself not excepted.* It is figured in Roxburgh, plate 77.

Launzan of the Burmas (Buchanania latifolia), is a lofty tree, native of Pegu. The fruit when ripe is red, and like a Peach, consists of a succulent outer flesh, containing a hard shell in which there is a single seed. The outer fleshy part is said to be agreeably acid; the kernels are used as Almonds, and taste like a Walnut, but are rather softer and more oily.†

The wild fruit of several other trees and shrubs is eaten by the natives of India. On the coast of Malabar, the *Alangium decapetalum*,‡ and the *Elæocarpus serratus*,‖ are articles of food. In Coromandel the berries of *Flacourtia sepiaria* § are sold in the markets; those of another species of the same genus, *Flacourtia sapida*,¶ are said to be very good; the Cherry-like fruit of *Diospyrus chloroxylon*** is very palatable; and the little berries of *Ferreola buxifolia*†† are universally eaten and very well tasted. But to mention all such would occupy more time and space than the subject would deserve; I shall therefore pass on to the fruits of

* Roxburgh, Vol. i. page 55.

† Buchanan in Asiatic Researches, Vol. v. page 123.

‡ *Angolam*, Rheede, Vol. iv. t. 17.

‖ *Perim-kára*, Ibid. Vol. iv. t. 24.

§ *Canrew* (Telinga) Roxburgh, Vol. i. page 48. t. 68.

¶ *Pedda Caanrew* (Telinga,) Ibid. Vol. i. t. 69.

** *Nella Woolymera* (Telinga) Ibid. Vol. i. page 38. t. 41.

†† *Pishanna* (Telinga) Ibid. Vol. i. page 35. t. 45.

CHINA AND JAPAN,

with which my remarks will terminate. In these latitudes the cultivated fruits, with the exception of *Sapindaceæ*, consist almost entirely of the same natural orders as those of Europe, or at least approximate considerably to them. The place of the *Myrtaceæ, Guttiferæ,* and *Terebintaceæ* of countries nearer the Equator is chiefly occupied by *Pomaceæ* and *Prunaceæ;* the latter, however, differ universally in their kinds from what are known in this quarter of the world, and not unfrequently surpass them in quality, if we may credit the best authorities on the subject.

Of *Pears,* there are several kinds, some of which have lately been introduced into Europe by the Horticultural Society. But besides those of a common appearance, MARCO POLO asserts that there are at all seasons in the markets in Kin-sai, Pears of an enormous size weighing ten pounds a piece, which are white in the inside, melting, and with a fragrant smell.* Van BRAAM also speaks of Pears of a large size which were commonly sold by the road-side in the north of China. He describes them to have measured fifteen inches and a half in circumference the long way, and fourteen inches the round way; their colour of a fine golden yellow, their flesh melting, and their taste very agreeable. He considered it to be the only kind cultivated in the northern provinces.†

Of *Peach* trees there are three principal kinds, the *Dwarf* Peaches, the Peach *Bushes,* and the *Tree* Peaches; of each of which there is a vast variety of sorts. The two first are

* Marco Polo, by Marsden, page 514.

† Ibid. in note.

principally esteemed for their flowers, and as objects of ornament; the tree Peaches are what the Chinese cultivate for the sake of their fruit; and some of them grow to the height of forty or fifty feet; but these seem to be of a particular kind, and their fruit is of middling quality. In favourable seasons the markets of Pekin abound in the greatest variety of Peaches; some of which arrive at a prodigious size, being much larger than they ever are in France. The Chinese gardeners speak of fruit weighing two pounds, and MARCO POLO asserts that he has seen them of that size in the district of Cang-chew;* the largest, however, which the French Missionaries at Pekin ever saw, were about three inches and a half long, and three inches broad. These large varieties are very beautiful, but their taste is in general inferior to their appearance. Those, however, of Siang-chou (a villa of the Emperor's) equal the most melting and delicious of Europe, more especially one sort which is late and of an indifferent appearance, but of an exquisite flavour. The varieties are classed according to the form, colour, size, and time of ripening of their fruit. Some have a green flesh, others white, pale yellow, orange, and marbled; their form is flat, round, oval, or produced on one side into a beak, which again is either straight or curved. The gardeners possess the secret of preserving fruit gathered in October until January, and with all the beauty, freshness, and flavour which it possessed when first taken from the tree. Although well acquainted with the European method, they prefer budding their fine kinds upon stocks raised from the seed of the best varieties.†

* Marco Polo, by Marsden, page 464.

† Mémoires sur les Chinois, Vol. xi. page 280.

Of *Grapes* the Emperor KANG-HI mentions three kinds which he caused to be introduced from Hami and the neighbouring districts. Of one sort the berries are red, or greenish, and long like the teats of a mare; of another, the flavour and smell are very agreeable, but the berries not large; those of the third variety, which are the most delicate, the sweetest, and the most highly perfumed, are not larger than peas.*

Of the *Pomegranate*, RUMPHIUS says two sorts are known, one with exceedingly sweet fruit and the other with a vinous taste, and small granules with large seeds.†

The *Jujube* tree (Ziziphus Jujuba) is universally cultivated for the sake of its fruit, which is brought to a very high degree of excellence both in appearance and flavour. There is no fruit-tree, perhaps, which requires less care than this, and none certainly on which the Chinese have bestowed so much pains in the improvement of it; it always bears abundantly, and is sufficiently esteemed to form a part of the dessert at the best tables. Among more than sixty kinds which they enumerate there are early, late, long, round, large, small, white, yellow, red, violet, pink, murrey-coloured, perfumed, honey-scented, sweet and acid sorts, and finally, some with kernels and some without them.‡ The tree is common enough in this country, and probably would bear fruit in a common green-house, with a very moderate degree of artificial heat.

The *Kaki* (Diospyros Kaki), is another fruit which has never been perfected in England, although the tree has been here for many years, and although there is no doubt that it would well repay the trouble of cultivation. The fruit is the

* Mémoires sur les Chinois, Vol. iv. page 472. † Rumphius, Vol. ii. page 95.
‡ Mémoires sur les Chinois, Vol. iii. page 482.

size and shape of an Apple with a reddish orange coloured skin; the flesh is semi-transparent, brown, soft, and pulpy, with a most agreeable honey-like flavour. In the inside are several hard seeds. Of the varieties the chief are,

1. *Ono Kaki,* of which the fruits are like an Orange; being dried in the sun and mixed with sugar, they are preserved and sold as Figs.

2. *Kineri Kaki,* of which the fruit is not fit for drying, but must be eaten fresh.

3. *Ssibu Kaki,* of which the fruit is bitter and not fit to eat.* Two varieties are figured among the Oriental Drawings of the Society.

The *Longan* or *Long-yen,* and the *Li-tchi,* two species of Dimocarpus, are held in high estimation, and are cultivated in considerable variety;† the inhabitants eat them with tea.‡ To the account in the *Transactions* of the Society,‖ I find it necessary to add nothing, except that the trees bear fruit much more quickly when raised from cuttings than they do if reared from seeds, requiring eight or nine years in the latter case, and only three or four in the former.⸸ The fruit of the Long-yen which was produced at Mr. Knight's of Lee Castle seems to have been in every respect as good as any grown in China.

The *Loquat* (Eriobotrya japonica††), has also frequently

* Kæmpfer, Amœnitates exoticæ, page 806.

† Carey's Hortus Bengalensis, page 28. ‡ Osbeck's Voyage, Vol. i. page 308.

‖ Horticultural Transactions, Vol. ii. page 402.

⸸ Sonnerat Voyage aux Indes, Vol. ii. page 230. Lamarck Encyclopedia, Vol. iii. page 574.

†† This is the Mespilus japonica figured in the Horticultural Transactions, Vol. iii. page 299. plate 11.

ripened its fruit in the conservatories about London; it is sufficiently well known to render any account of it unnecessary.

The Chinese also produce at table the thickened peduncles of *Hovenia dulcis*, and they are said to taste like a Bergamot Pear,* but I believe they are not in much esteem. There are, probably, some others of minor importance which have escaped my recollection, not to mention the excellent *Psidium Cattleianum;* but I apprehend they will be found to be such as are far surpassed by the commonest garden fruits of our own climate. In

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is a fruit known among the English by the appellation of the *Otaheite Apple* (Spondias cytherea), which is held in some estimation. It is the produce of a large upright tree with pinnated ash-like leaves and bunches of small white flowers. SONNERAT, who saw it cultivated in the Isle of France, describes the fruit as being as large as a hen's egg, with a fleshy coat, and a great stone covered with fibres, which penetrate the flesh. Its taste is like that of a Reinette Apple, but less agreeable. He adds that it is easily propagated by cuttings.†

Before I conclude I must beg to state distinctly that either to describe or mention all the fruits which may or can be eaten has not only been quite foreign to my purpose, but would have swelled this paper to a most inconvenient size. Indeed, I am sensible that it is already longer than perhaps it ought to have been, but I have in vain endeavoured to

* Kæmpfer, page 809. † Sonnerat Voyage aux Indes, Vol. ii. page 222. t. 123.

shorten it without in a great measure frustrating the intentions with which it was written. My purpose has been to point out the principal features of the objects I have described in as brief a space as possible, so that a tolerably accurate notion might be formed of their appearance and qualities. The authorities on which I have relied for my information are such as have the highest reputation for accuracy; and as I have uniformly quoted them with scrupulous exactness, every one may form his own opinion of their credibility.

IX. *Some Account of a* Collection of Pears, *received by the Society in October*, 1821. *from M.* Hervy, *Director of the Royal Garden of the Luxembourg, at Paris. By Mr.* John Turner, *F. L. S. Assistant Secretary.*

Read January 15, 1822.

The reputation for accuracy in names which the Collection of Fruit trees in the garden of the Luxembourg has acquired, made it extremely desirable that specimens of the fruits grown there, (particularly of the *Pears*), should be obtained for the inspection of the Society. With this view Mr. Sabine last year solicited the assistance of M. Bosc, the superintendant of the garden, and from him nineteen varieties were received; of these I took such notes as appeared to be necessary at the time, and in examining the collection received in October, I derived much advantage from them.

For the second collection we are indebted to the kindness of M. Hervy the Director of the garden; it consisted of twenty-eight varieties, all of which arrived in perfect preservation.

To the horticultural zeal of M. Hervy, and to that of his father, the world owes the establishment of the garden of the Luxembourg, as a receptacle for fruit trees, and at the same time it owes them its gratitude for having been instrumental in preserving from destruction the most choice collection of trees that had ever been formed in any country.

In the garden of the Chartreux had been assembled the most curious and valuable fruit trees which the labours of the fathers during a century and a half, had been able to procure. The propagation of young plants from these, and the sale of them to all parts of the world, had become a source of considerable profit to the institution, and had stimulated its superiors to bestow the greatest attention upon their garden.

In the early part of the revolution, the elder M. Hervy saw the probability that the storm which was destroying every religious establishment in France would not pass over the Chartreux without desolating it like the rest; he, therefore, applied for, and obtained permission from the existing government, to establish a national garden of fruit trees, to which might be removed the entire collection of the Chartreux. In this undertaking he was ably assisted by his son, the present Director, under whose careful management the accuracy of the original nomenclature has been rigidly preserved. The proof of this is in the fact, that in no instance have I found a disagreement in the names of the fruits received from the Luxembourg, and the description of them given by Duhamel, all of which were made from the trees then growing in the garden of the Chartreux.

To the collection of established kinds, splendid as it is, the Superintendant and Director of the Luxembourg garden have not been unmindful to add such new varieties of fruits as appeared to merit their attention. Amongst these will be found the Beurrée Rance, a Pear of Flemish origin, and the excellence of which entitles it to a place in every good collection. I have described it as accurately as I could, and

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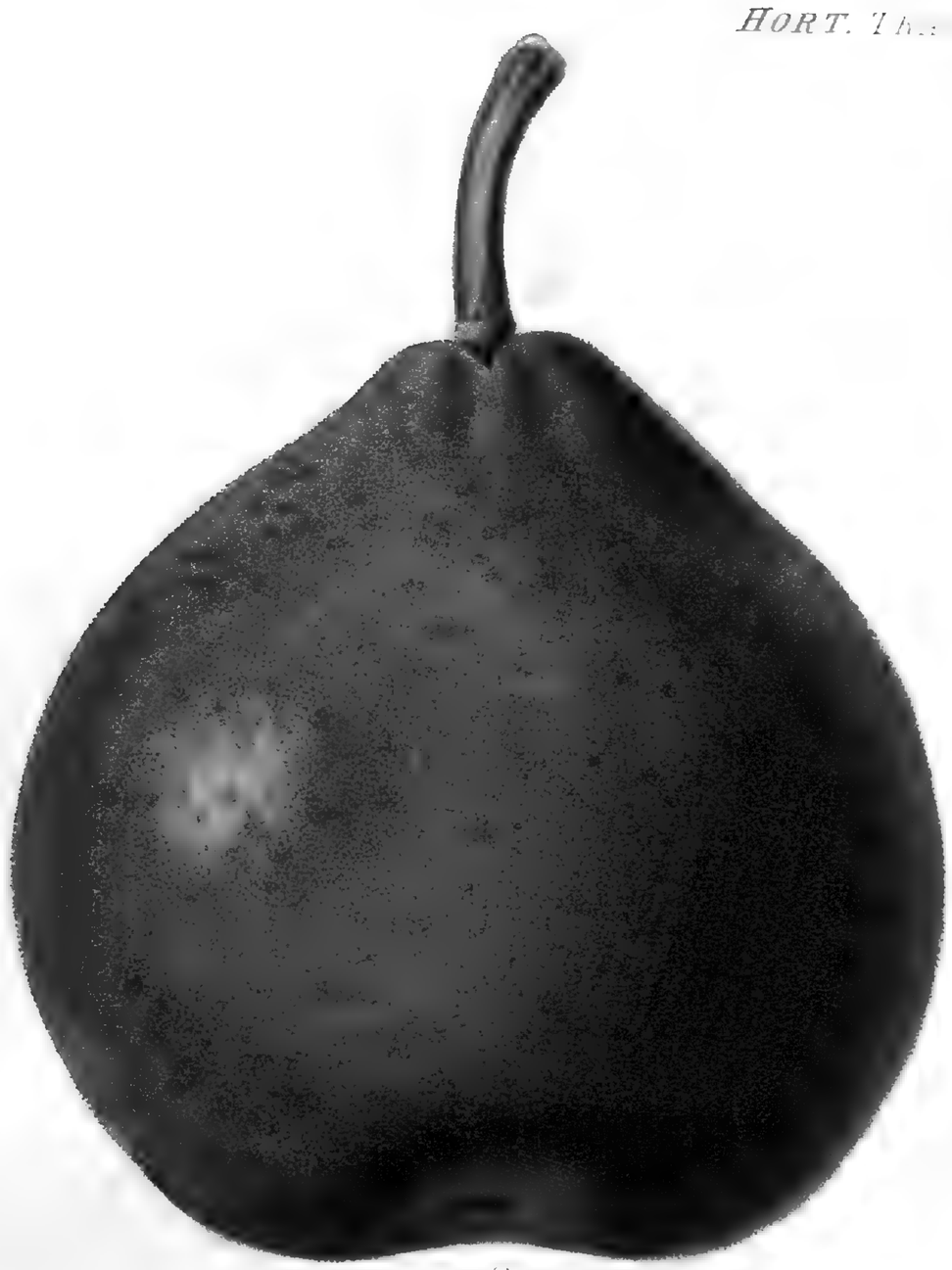

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3

4

W. Hooker fecit.

1. Doyenné gris.
2. Rezy de la Motte.

3. Orange d'hiver
4. Beurrée Rance.

the beautiful figure of it by Mr. HOOKER, which is annexed, will convey a perfect idea of its form and colour.

The following is a List of the Pears received:

Bergamotte d'automne.	Doyenné blanc.
Bergamotte de Pâques.	Doyenné gris.
Beurrée Rance.	Epine d'hiver.
Bezy d'Héry.	Frangipane.
Bezy de Montigny.	Gilogille.
Bezy de la Motte.	Martin Sec.
Bon Chrétien d'hiver.	Messire Jean.
Catillac.	Orange d'hiver.
Chat-brulé.	Poire de prêtre.
Chaumontel.	Royal d'hiver.
Colmars.	Saint François.
Crasanne.	Saint Germain.
Donville.	Saint Lézin.
Double fleur.	Virgouleuse.

BERGAMOTTE D'AUTOMNE.

Bergamotte d'automne. *Cat. du Luxembourg, p.* 33. DUHAMEL, *tom.* ii. *p.* 165, *cum Ic. Jardin Fruitier, tom.* iii. *p.* 108, *cum Ic.*

DUHAMEL considered this as one of the oldest Pears, and says it had always been justly esteemed as one of great excellence. It is different from the Autumn Bergamot of the English gardens, which I believe to be the Bergamotte rouge of the French. The Bergamotte d'automne is of the middle size, globular, flattened a little in its upright diameter: the eye is seldom or never sunk; the stalk is short and thick. The skin is green, becoming yellow as it ripens, covered with

many small brown spots and larger patches of dark russet. Flesh melting, juicy, highly and pleasantly perfumed. It ripens in October, and will keep with care till November.

Bergamotte de Paques.

Bergamotte de Pâques; Bergamotte de Soulers; Bergamotte de Bugi; Bergamotte d'hiver; *Cat. du Lux. p.* 33. Bergamotte de Pâques; Poire Bugi, De la Quintinye, *tom.* i. *p.* 309. Bergamotte de Pâques, Duhamel, *tom.* ii. *p.* 169, *cum Ic.* *Jardin Fruitier*, *tom.* iii. *p.* 109, *cum Ic.*

This is the Easter Bergamot of the English gardens, and is known also under the name of the Terling or Tarling, the Paddington Pear, and the Tarquin. De la Quintinye says it is called a Bergamot because in colour and size it somewhat resembles the Bergamotte d'automne. This may account for its possessing a name to which its quality does not entitle it, for it is entirely free from perfume. Its greatest excellence is its durability, for it will keep perfectly sound till May, and, with care, even till June. It is of the middle size, more turbinate in form than the Bergamotte d'automne. The skin is pale green, rarely having any approach to yellow, sprinkled with small spots of dark green, and sometimes with a few large brown spots; the best ripened specimens are sometimes slightly tinged with red on the side exposed to the sun. The flesh is white, firm, and crisp, abounding in sweet refreshing juice, which is very agreeable, particularly at the late season of the year when it is fit for the table.

Beurrée Rance.

This is a very superior seedling raised by Mr. Hardenpont at Mons, where it is also called the Beurrée Hardenpont de

printemps, and is considered the best of the late Pears. Though introduced into the garden of the Luxembourg, it has not yet appeared in the Catalogue of that collection. I believe it to be the same which M. NOISETTE has mentioned in the *Jardin Fruitier*,* under the name of the Beurrée d'hiver, which, he says, was obtained from Brabant. It somewhat resembles a Colmars in form, but is longer, and not so blunt at the insertion of the stalk. The eye is large, very little sunk; stalk long; skin green, never becoming yellow, nor partaking of red, sprinkled with many minute brown spots. Flesh greenish white, melting, with a little grit at the core, very juicy, sweet, and high flavoured. Specimens of this very excellent Pear were received from M. PARMENTIER, of Enghien, in November, 1820. The tree bears well either as a standard, or on a wall, and the fruit keeps well till March and April.

BEZY D'HÉRY.

Bezy d'Hery, *Cat. du Lux. p.* 34. DUHAMEL, *tom.* ii. *p.* 139. Besidery, DE LA QUINTINYE, *tom.* i. *p.* 311.

This is a Pear of inferior quality; DUHAMEL, however, says it is not without merit when grown in strong soils. It is perfectly round; the skin is of a clear yellow colour, flesh unusually white, and generally with little flavour. It ripens in the end of October, but will keep till December.

BEZY DE MONTIGNY.

Bezy de Montigny, *Cat. du Lux. p.* 34. DUHAMEL, *tom.* ii. *p.* 207, *cum Ic. Jard. Fruit. tom.* iii. *p.* 114, *cum Ic.*

DUHAMEL is the first writer who mentions this Pear. It

* Tom. iii. page 113.

appears to be a small variety of the Doyenné blanc, which it greatly resembles, but its skin is greener until the full period of its maturity. The flesh, like that of the Doyenné, is white, perfectly melting, without grit, high flavoured, with a very agreeable musk perfume. It is fit for the table about the end of September or beginning of October, and is not so perishable as the Doyenné.

Bezy de la Motte.

Bezy de la Motte, *Cat. du Lux. p.* 34. Duhamel, *tom.* ii. *p.* 206, *cum Ic. Jard Fruit. tom.* iii. *p.* 113, *cum Ic.*

This resembles the Crasanne in shape, and is generally about the same size, but the stalk is not so long. The skin is yellowish green, much spotted with dark russet. The flesh is white, melting, with a little grit, sweet, juicy, and high-flavoured. The tree always retains its spines, is vigorous in growth, and bears abundantly. The *Bon Jardinier* says it succeeds best as a standard. The fruit ripens in the end of October, and beginning of November.

Bon Chrétien d'hiver.

Bon Chrétien d'hiver, *Cat. du Lux. p.* 34. De la Quintinye, *tom.* i. *p.* 245. Duhamel, *tom.* ii. *p.* 212, *cum Ic.* Poiteau, *p.* 114, *cum Ic. Jard Fruit. tom.* iii. *p.* 111, *cum Ic.*

Among all the Pears for which we are indebted to the French, certainly none, in point of value, exceeds the Bon Chrétien d'hiver. When we consider its large size, its excellent keeping quality, and its high flavour, we must allow it a place in the very first rank. De la Quintinye considered it the oldest of all the Pears, and believed it to be the Crus-

tuminum and Volemum of the Romans,* and that in the rise of Christianity it received its present name. It succeeds best when grafted on a Quince stock, and even in the climate of Paris requires a wall.

CATILLAC.

Catillac; Cadillac, *Cat. du Lux. p.* 37. Catillac, DUHAMEL, *tom.* ii. *p.* 233, *cum Ic.* POITEAU, *p.* 74, *cum Ic.* *Jard. Fruit. tom.* iii. *p.* 218, *cum Ic.*

The Catillac is well known in this country as a baking Pear. Under favourable circumstances, however, it is by no means undeserving a place in the dessert. It continues in use from the end of December to the beginning of March.

CHAT BRULE'.

Chat brulé; Pucelle de Saintonge, *Cat. du Lux. p.* 35. Chat brulé; Pucelle, DE LA QUINTINYE, *tom.* i. *p.* 319. Chat brulé, DUHAMEL, *tom.* ii. *p.* 247.

This resembles the Martin Sec, but is something larger, and the colour of its skin is of a more dusky brown. It is a very inferior fruit for the dessert, and even as a compôte Pear has many superiors. It ripens in the beginning of November.

CHAUMONTEL.

Chaumontel; Beurrée d'hiver, *Cat. du Lux. p.* 34. Bezy de Chaumontel, Beurrée d'hiver, DUHAMEL, *tom.* ii. *p.* 199, *cum Ic.* Bezy de Chaumontel, POITEAU, *p.* 56, *cum Ic.* *Jard. Fruit. tom.* iii. *p.* 113, *cum Ic.*

We have the authority of DUHAMEL for the origin and age of this Pear. He states that in his time (1765) the original tree, then about 100 years old, was still in existence at Chaumontel,† where it sprang from seed. This variety is too well known to require description. It succeeds best grafted on a Quince stock, and in a rich light soil.

* Plin. Hist. Nat. lib. xv. cap. 15. † A lordship in the Department of the Oise.

Colmars.

Colmars; Poire-manne; Belle-et-bonne, *Cat. du Lux. p.* 36. Colmart; Poire-manne, Duhamel, *tom.* ii. *p.* 222, *cum Ic. Jard. Fruit. tom.* iii. *p.* 118. Colmar; Poire Manne; Bergamotte tardive, De la Quintinye, *tom.* i. *p.* 279.

The excellence of this Pear has long made it a favourite in the English gardens; it has, however, the great defect of being a shy bearer. In fertility, the variety which is now cultivated under the name of the Poire d'Auch is much its superior. It is difficult to discover any difference between the fruit of the Colmars and Auch, but that they are different varieties is manifest by the superior fruitfulness of the latter.

Crasanne.

Bergamotte Crasanne, *Cat. du Lux. p.* 33. Duhamel, *tom.* iii. *p.* 166, *cum Ic.* Crasane, De La Quintinye, *tom.* i. *p.* 276. Crassane, *Jard. Fruit. tom.* iii. *p.* 109, *cum Ic.*

De la Quintinye informs us that the Crasane is so named from *écrasie* (flattened or crushed), its form generally giving to the fruit the appearance of having been pressed down. It is too well known to require any description.

Donville.

Donville; Bequesne; Poire de Provence, *Cat. du Lux. p.* 37. Duhamel, *tom.* ii. *p.* 245.

This is a Pear of the middle size, very round at the eye, but somewhat lengthened in its form. It is hard-fleshed but not gritty. It keeps till April, and is then pretty good, but in a more early stage its juice, though highly flavoured, is austere.

DOUBLE FLEUR.

Double Fleur, *Cat. du Lux, p.* 37. DE LA QUINTINYE, *tom.* i. *p.* 310. DUHAMEL, *tom.* ii. *p.* 177. *Jard. Fruit. tom.* iii. *p.* 118, *cum Ic.*

This is a very handsome Pear of the middle size, round, and flattened. It is of little value for the dessert, but is excellent when cooked. DE LA QUINTINYE considered it the best of all the compôte Pears.

DOYENNE' BLANC.

Doyenné blanc; Saint Michel; Poire de Lemon; Poire Neige; Poire de Seigneur, *Cat. du Lux. p.* 34. Doyenné blanc; Saint Michel; Beurré blanc d'automne; Poire de neige; Bonnente, DE LA QUINTINYE, *tom.* i. *p.* 114. Doyenné; Beurré blanc; Saint Michel; Bonne-ente, DUHAMEL, *tom.* ii. *p.* 205, *cum Ic.* Doyenné, POITEAU, *p.* 83, *cum Ic. Jard. Fruit. tom.* iii. *p.* 114, *cum Ic.*

This Pear is pretty generally cultivated in this country, and is often found with its proper name of Doyenné, though frequently with local names. It varies considerably in its form, some being nearly round, others as long as a Colmars The stalk is short, the skin of a pale yellow washed with pale scarlet on the side exposed to the sun. The flesh is melting, very white, abounding in juice, the remarkable coldness of which has given the Pear its name of Poire de Neige. It ripens from the beginning to the end of October, according to the season or situation, and will not keep good many hours after being gathered. Its beauty and pleasant flavour during the short time it is in perfection recommend it, added to which the tree is an abundant bearer.

Doyenné gris.

Doyenné gris, *Cat. du Lux. p.* 34. Duhamel, *tom.* ii. *p.* 208, *cum Ic.* Doyenné roux, Poiteau, *p.* 100, *cum Ic. Jard. Fruit. tom.* iii. *p.* 114, *cum Ic.* Doyenné gris ou d'automne, *Bon Jard.*

Duhamel was the first who noticed this excellent Pear, he for some time believed it to be the same as the Doyenné blanc, and only altered in its character by soil and situation; he, at length, however, observed that in the garden of the Chartreux, as well as in some others, it constantly varied so much from the Doyenné blanc in many essential particulars as to satisfy him that it was a distinct variety. Time has proved that he was right, for it not only differs materially in appearance, but it is near a month later in ripening, and is a very superior Pear. Poiteau and Turpin, in the enlarged edition of Duhamel, changed its name to Doyenné *roux*, believing that term to designate its colour more truly than *gris*. In this change they have been followed by M. Noisette, in the *Jardin Fruitier*. From all the specimens which I have seen, I consider this change was necessary for sake of accuracy, for the skin is of the bright cinnamon colour which is seen on the best ripened specimens of the Gansell's Bergamot, and which is certainly nearer to red than gray. It resembles the Doyenné blanc in form, but seldom attains to so large a size; the flesh is not so white, is more crisp, and it keeps longer after being gathered. Its period of ripening is towards the end of November. The annexed figure by Mr. Hooker will convey a most perfect idea of this beautiful fruit.

EPINE D'HIVER.

Epine d'hiver, *Cat. du Lux. p.* 32. DE LA QUINTINYE, *tom.* i. *p.* 261. DUHAMEL, *tom.* ii. *p.* 164, *cum Ic.* *Jard. Fruit. tom.* iii. *p.* 112, *cum Ic.*

Unless ripened under favourable circumstances this Pear possesses little flavour. It is of the middle size, rather long than round; the skin is generally green, but when the fruit is well ripened it assumes a yellow hue, and then is invariably of good quality. DUHAMEL directs that in a dry soil it should be grafted on a free stock, and on a Quince if the soil be wet. It does best as a standard, and ripens in November, but may be preserved till January. It is the Winter Thorn of the English gardens.

FRANGIPANE.

Franchipane, *Cat. du Lux. p.* 34. DUHAMEL, *tom.* ii. p. 210, *cum Ic.* Frangipane, POITEAU, *p.* 35, *cum Ic.* *Jard. Fruit. tom.* iii. *p.* 115, *cum Ic.*

This Pear is doubtless so named from a supposed resemblance in its flavour to the patisserie called Frangipane, or Franchipane. It somewhat resembles the Windsor Pear in form, but is smaller; its skin is pale or greenish yellow on the shaded side, spotted with red where exposed, and sometimes, though rarely, washed with red. The whole surface is sprinkled with minute green spots, and is unctuous to the touch. The flesh is white, crisp, though rather melting, juicy and sweet, with the peculiar flavour above alluded to. POITEAU says it ripens in November, all the other writers who mention it give the end of October as the period of

maturity; those which I have tasted in several seasons were perfectly ripe early in October. The tree is an abundant bearer, producing its fruit in clusters.

Gilogille.

Gilogille; Poire à Gobert; La Garde d'Ecosse, *Cat. du Lux. p.* 37. Poire à Gobert, Duhamel, *tom.* ii. *p.* 191

The specimens received appear to be the Pear described by Duhamel under the name of Poire à Gobert, and not the Poire d'Agobert of Poiteau, though they are generally understood to be the same. They are alike in form, but the Gilogille or Poire à Gobert keeps till May and June, the Poire d'Agobert, on the contrary, ripens in October.

Martin Sec.

Martin Sec, *Cat. du Lux. p.* 35. Duhamel, *tom.* ii. *p.* 152, *cum Ic.* Poiteau, 108, *cum Ic.* *Jard. Fruit. tom.* iii. *p.* 107, *cum Ic.* Martin Sec de Champagne, De La Quintinye, *tom.* i. *p.* 285.

This excellent Pear, of the *cassante*, or crisp-fleshed kind, is tolerably well known in this country under its translated name of Dry Martin. It keeps well till January, and is at that period a rich and high flavoured fruit.

Messire Jean.

Messire Jean, *Cat. du Lux. p.* 35. De La Quintinye, *tom.* i. *p.* 286. Duhamel, *tom.* ii *p.* 173, *cum Ic.* Poiteau, 43, *cum Ic.*

It is surprising that this Pear, which is certainly inferior to none of the crisp kinds, should be still hardly known in the

gardens of this country, although it is one of the oldest French varieties. DE LA QUINTINYE speaks very favourably of it, though, I think, not equally to what it deserves; and DUHAMEL has justly described it as being very high flavoured and excellent. It is of the middle size, generally round, but sometimes a little elongated, uneven at the surface, skin coarse and russeted. The flesh is sometimes a little stony, but of a pleasant crisp texture, very juicy and rich. It ripens towards the end of October. DUHAMEL considers all the varieties of gray, white, and golden as the same, influenced only by the stock.

ORANGE D'HIVER.

Orange d'hiver, *Cat. du Lux. p.* 33. DUHAMEL, *tom.* iii. *p.* 144, *cum Ic. Jard. Fruit. tom.* iii. *p.* 107, *cum Ic.*

This is of the middle size, perfectly round, the eye is prominent, or rarely sunk beneath the head, the stalk is long in all the specimens which I have seen, although DUHAMEL describes it as being little more than half an inch long. The skin is of a rich yellow, sprinkled with very minute brown spots. The flesh is white, crisp, free from grit, and abounding in agreeable musked juice. It ripens from February to April.

POIRE DE PRÊTRE.

Poire de Prêtre, DUHAMEL, *tom.* iii. *p.* 190.

This is of the colour of the Messire Jean, almost globular in form, hard-fleshed, with rather an astringent juice. It is, however, high flavoured, and is valuable as a compôte Pear. It keeps well till February, and even later.

Royale d'hiver.

Royale d'hiver; Muscat Allemand, *Cat. du Lux. p.* 35. Royale d'hiver, Duhamel, *tom.* ii. *p.* 191, *cum Ic.* Poiteau, *p.* 118, *cum Ic.* *Jard. Fruit. tom.* iii. *p.* 120, *cum Ic.*

This resembles the Colmars in form, but is considerably larger. The flesh is semi-beurré, slightly gritty, and of good flavour. It ripens in January and February.

Saint François.

Saint François; Bonne-amet; Poire de Grillan, *Cat. du Lux. p.* 35. Saint François, De La Quintinye, *tom.* i. *p.* 326.

The Saint François is a long tapering Pear, not very unlike the Saint Germain in form. The skin is greenish yellow, thickly sprinkled with brown spots. The flesh is white, soft, with little flavour, but is tolerably good when stewed.

Saint Germain.

Saint Germain; Inconnue la Fare, *Cat. du Lux. p.* 35. Duhamel, *tom.* ii. *p.* 225, *cum Ic.* Saint Germain; Inconnue de la Fare, De La Quintinye, *tom.* i. *p.* 277. Saint Germain, Poiteau, *p.* 89, *cum Ic.* *Jard. Fruit. tom.* iii. *p.* 117, *cum Ic.*

Of this Pear there are two varieties in this country, one very inferior to the other, but differing little in appearance. Two sorts are also metioned by Duhamel as having been first noticed by Merlet. Mr. Knight, in a paper in a former Volume of the Society's *Transactions,** says the spurious variety ripens in December, and decays before the end of January; the true sort remains in perfection till the latter end of March. There is a good figure of the true sort in the *Pomona Londinensis,* plate 5.

* Vol. i. page 226.

SAINT LÉZIN.

Saint Lézin, *Cat. du Lux. p.* 35. Saint Lézain, *Jard. Fruit. tom.* iii. *p.* 120, *cum Ic.*

The Saint Lézin resembles a very large Brown Beurré in form and colour, but its skin is more spotted. The flesh is yellow, crisp, with a remarkably high flavour, but very astringent. The Pear described by POITEAU under this name is certainly different from this.

VIRGOULEUSE.

Virgouleuse; Chambrette, *Cat. du Lux. p.* 35. Virgouleuse, DUHAMEL, *tom.* ii. *p.* 224, *cum Ic. Jard. Fruit. tom.* ii. *p.* 119, *cum Ic.* Virgoulé, DE LA QUINTINYE, *tom.* i. *p.* 101.

So named from Virgoulé, a village near the town of St. Leonard. This is a Pear of the middle size, very handsome in its form, and colour; it tapers gradually towards the stalk, and when ripe, the skin is a fine delicate yellow. Although it bears abundantly as a standard, it never attains to the perfection in this country which it acquires in France.

X. *Further Observations on the* Cultivation *of the* Pine Apple. *By* Thomas Andrew Knight, *Esq. F. R. S. &c. President.*

Read March 5, 1822.

The following circumstances, relative to the habits of the *Pine Apple* plant, appear to me so interesting and singular, that I am induced now to send an account of them to the Horticultural Society; though I have so recently addressed a communication* upon nearly the same subject. In that communication I mentioned the extraordinary growth of a Pine Apple, which had passed the whole of the last summer and autumn in very low temperature, and which then, in the beginning of November, continued to increase in size, four months having at that time elapsed, since the period of its blossoming. I saw the same fruit in the first week of the last month (February), when it still continued perfectly green, and apparently growing rapidly. Our Member Mr. Mearns, who has had not only the advantages of long and very attentive experience, but who has also visited the stoves of a very great number of the most celebrated cultivators of the Pine Apple in different parts of the kingdom, has been to view the fruit above mentioned; and he assures me that he has never seen a Queen Pine Apple growing upon so small a

* Horticultural Transactions, Vol. iv. page 543.

plant, so perfectly well swelled out, in any season of the year, under any circumstances. He was of opinion, when he saw it, which was early in the last month, that it would probably ripen about the end of the present month, or early in April. It had passed the winter in the temperature which is usually given to common green-house plants, and it had certainly not had the advantages in any degree of judicious management, having been very irregularly, and at times much too profusely, supplied with water. What will be the merits of it when ripe, time alone can shew, but I shall here observe, that I have found all Fruits, (and particularly the Melon), to acquire their highest state of excellence when their growth has been slow; provided it has been regularly progressive, and that the fruit has ultimately attained its proper size and perfect maturity; and I believe, that no fruit has ever been seen perfect, either in taste or flavour, the growth and maturity of which had been greatly accelerated by much fire-heat, and of necessity, abundant water. I am, therefore, much inclined to believe, that the Pine Apple will be found to acquire its highest state of excellence, when a considerable time elapses between the period of its blossom and that of its maturity.

Should it be found easily practicable, as I very confidently believe it will, to retard the ripening of the fruit of those plants of the Pine Apple, which blossom late in the summer, or early in the autumn, such fruit might be made to supply our tables abundantly in the spring, or early summer months.

Since my last paper, upon the management of the Pine Apple plant was written, I have placed a few plants, which have blossomed in autumn, in very high temperature, (generally above that of 80°), and very near to white glass of good quality, and so circumstanced, even the Queen Pine Apple has swelled nearly, if not quite, as rapidly, as it usually does in the best seasons of the year, and its taste and flavour have been quite as good as those of that kind usually are in winter. Other varieties have succeeded better, and one, which I received without a name from the West Indies, and which I am informed is the St. Vincent's Pine Apple, acquired, in the last month, a degree of excellence both in taste and flavour, which I have rarely found equalled in any season.

Note by the Secretary.

A few days after this paper was read to the Society, being on a visit to the President, at Downton, I had the gratification of observing the condition and appearance of the Pine Apple Plants described by him in the communication above referred to; the plants, which were expected to begin shewing their fruit in the next month, though young, were remarkable for their vigour and strength. They were grown in pots of much larger size than usual, which were raised so as to bring the upper leaves nearly in contact with the glass. The Plants themselves were firmly rooted in the mould, their

leaves were of peculiar breadth and substance, the stems were short and of unusual thickness, and the whole had the appearance of extraordinary health.

XI. *Notice of a new* Variety *of* Ulmus suberosa, *and of a successful Method of* Grafting slender Scions *of Trees. In a Letter to the Secretary. By* Thomas Andrew Knight, *Esq. F.R.S.&c. President.*

Read March 19, 1822.

My dear Sir,

I have addressed to you, according to your desire, some Scions of the young *seedling Elm*, which you saw growing here, and which you agreed with me in thinking likely to afford trees of more rapid growth and more picturesque forms, than any variety of the same species (Ulmus suberosa) at present propagated in the public nurseries.

I believe you will also think me justified in asserting that I have never seen a tree of any species, which has grown with equal rapidity, in as poor a soil: but I shall leave it to you to describe its form, and the circumstances under which you found it growing.*

The lateral branches which I send you are long and slender, and probably, not such as the grafters would wish to receive, or are accustomed to use: and I shall therefore take this

* This remarkable variety, which I propose to call the *Downton Elm*, was planted by the side of a road which has been formed with the broken rubbish of a stone quarry, in a situation certainly not very favourable to vigorous growth, but it has notwithstanding acquired a size and height full one-third beyond that of several plants taken from the same seed-bed, which are growing in similar circumstances near to it. The habit of the tree is peculiar, its leading branches spread in various directions, and are strong and vigorous, but the side branches are so pendulous as to give the whole tree the character which in varieties of other trees is called *Weeping*. Sec.

opportunity of describing a mode of using such slender grafts, which I have sometime practised with singular success, and which I think I can confidently recommend to the attention of those gardeners, who are in the habit of propagating by grafting species of trees, which often disappoint the hopes of the most skilful operator. In pointing out the advantage of this mode of grafting, which is not new,* but which, I believe, has rarely, or never, been properly executed, it will be necessary that I describe the motion of the sap, as I conceive it to be, at the period when grafts are most advantageously inserted.

The Graft first begins its efforts to unite itself to the stock just at the period when the formation of a new internal layer of bark commences in the spring; and the fluid, which generates this layer of bark, and which also feeds the inserted graft, radiates in every direction from the vicinity of the medulla, to the external surface of the alburnum. The Graft is of course most advantageously placed when it presents the largest surface to receive such fluid, and when the fluid itself is made to deviate least from its natural course. This takes place most efficiently, when a graft of nearly equal size with the stock is divided at its base and made to stand astride the stock, and when the two divisions of the graft are pared extremely thin, at and near their lower extremities, so that they may be brought into close contact with the stock (from which but little bark or wood should be pared off) by the ligature. I have adopted this mode chiefly in grafting Cherry trees, and I have rarely ever seen a graft fail, even where the wood has been so succulent and immature as to preclude every hope of success by any other mode. I send

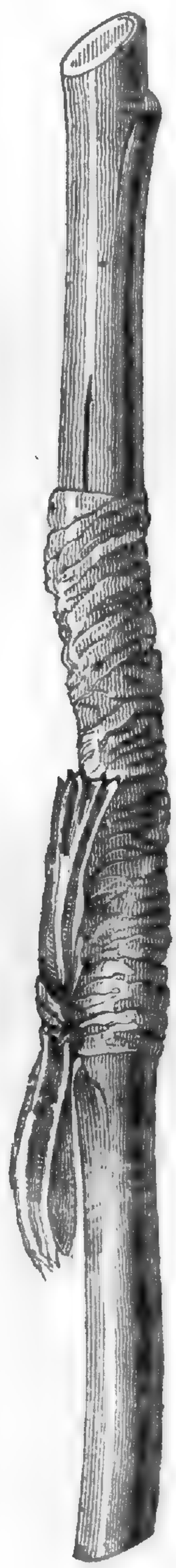
* It is generally known under the name of Saddle-grafting.

with the scions a couple of Pear-branches united in the manner recommended, from which a representation of the plan of grafting may be readily made.

Sincerely yours,

THOMAS ANDREW KNIGHT.

Downton,
16*th March,* 1822.



XII. *Further Account of* Chinese Chrysanthemums; *with Descriptions of several New Varieties. By* Joseph Sabine, *Esq. F. R. S. &c. Secretary.*

Read February 6, 1822.

Since I had the honour last year of laying before the Society an account* of the varieties of *Chinese Chrysanthemums* then known, the attention of the collectors of beautiful plants seems to have been more attracted to them; for though the last autumn was unfavourable to their blossoming in perfection, yet I observed them to be much more extensively cultivated. Gardeners have also become more skilful in the management of these plants; but all former modes of treatment will now be superseded by that of Mr. Wells, recently communicated to the Society,† which may fairly be expected to enable our gardens to rival those of the Chinese in this their favourite class of plants. The Chrysanthemums are particularly deserving the attention of those who can give them the protection of glass, under which they may be kept in perfection till Christmas, and during the months of November and December they render the conservatory and green-house as gay and splendid as at other more genial seasons of the year.

It is with no small degree of satisfaction, therefore, that I again bring these plants under the notice of the Members of the Society, and more particularly so as I am enabled to

* See Horticultural Transactions, Vol. iv. page 326 † Ibid, page 571.

communicate to them that the Society has had greater success in the importation recently made from China than my best hopes had anticipated.

Of the two new varieties described last year, the *Quilled flamed Yellow* is now very generally known, and nothing further is necessary to be added to the account given of it. But the *Quilled Pink Chrysanthemum*, which had then blossomed but imperfectly, having in the present season been seen in full splendour, I am enabled to describe it more correctly.

The expansion of the flower is from three and a half to four inches, the colour being a most delicate vivid pink; the florets, after spreading horizontally a part of their length are curved forwards, and their ends are bent inwards, having an appearance quite different from every other variety; they diminish in length as they approach the centre, still keeping the character of incurvation, and thus forming a full double flower of arched florets without a disc; the florets are rather flattened, and they all open their lips on their inner side, by which their ends are widened considerably, and they have thereby more breadth and importance individually. The expanded flower has the scent of new honey-comb, similar to that given out by the Quilled White. The buds are a dull pink before they open. It is certainly the most beautiful of any of the varieties yet known in Europe, but it is late in coming into blossom, and does not yield many flowers; improved management will, however, make it more perfect.*

* Since this Paper was read to the Society, a figure of this new variety has been published in the *Botanical Register*, plate 616, from a specimen exhibited at a Meeting of the Society, from the garden of William Wells, Esq. at Redleaf, near Tonbridge.

In my former communication,* I mentioned that the Society was in possession of eleven different kinds, imported for them by Captain Mayne, in the year 1820; of these eight have blossomed well this season, in the garden of the Society, making a valuable addition to our former stock, the number of the kinds formerly noticed were fourteen, that of the whole collection, therefore, is now twenty-two. I proceed to describe the new varieties.

1. *Early Crimson Chrysanthemum.* Whether we regard the period of the flowering of this variety, the abundance of its flowers, or their rich colour, it will be considered one of the foremost in value. The plant does not grow strong or tall, but is disposed to throw up several stems, each stem bearing many branches, and each of these again producing so many flowers, that they may be said to grow in clusters. It blossoms even before the Quilled White, which is much the earliest of the old sorts. The flowers smell as usual of Chamomile, but not disagreeably so, and at their first opening their scent is considered by some persons even pleasant; their colour exactly accords with Werner's Red Lake,* but may fairly be called crimson, being very bright; the whole flower is slightly pendent; the expansion of a good blossom is about three inches, the florets are nearly all ligulate, they are numerous, and lie close over each other, projecting a little forward, and then recurving; they do not usually diminish much in length towards the centre, consequently, the middle of the flower appears not filled up, as it is in the Buff and Rose Chrysanthemums; sometimes, however, there are a few

* Horticultural Transactions, Vol. iv. page 334.

† Werner's Nomenclature of Colours by Patrick Syme.

small ligulate florets in the centre, and they are rather darker in colour; but even when they do come they do not prevent the disc, which is small and formed of little yellow tubular florets, being apparent when the flower is fully blown; a few of the larger florets are occasionall quilled a small part of their length, but this is only accidental, and not a permanent character. After the flowers have been some time opened, and fully expanded, the colour, especially of those regular florets about the centre, becomes paler. The leaves are narrow and small in comparison with those of some other sorts; the indentures of their lobes are deep, the lobes do not overlap, and their serratures are sharp-pointed. One of the figures in the annexed engraving represents this plant.

2. *Large Quilled Orange Chrysanthemum.* This will be admired both on account of the character and grandeur of the flower. The plant grows tall, the branches have rather a spreading habit, and they do not bear many flowers. It comes into flower as early as the first of the old sorts, except the Quilled White, which precedes it. The flowers smell strong of Chamomile; their general colour is a reddish orange, but darker in the centre when the florets have not expanded, and these, if examined closely, when young, and before they expand, have a tint of dull crimson: the buds also are dull crimson on their first appearance; the expansion of the flower is flat, and full five inches; the florets being numerous cause the whole flower to be heavy, and it consequently bends down a little, notwithstanding the stem which supports it is strong. The florets are of different lengths, and therefore do not, when viewed together, give a regular

1. The Early Crimson Chrysanthemum.
2. The Large Quilled Orange Chrysanthemum.

Published by Hooker, 1822

even margin to the whole flower, which, however, seems quite filled up by the florets towards the extremities, and does not appear to have an unequal or ragged edge; the preceding description applies to a very perfect and central flower, the side flowers are of less size. The outside florets are perfectly quilled, enlarging from their bases, which are very small, to the top, which contracts slightly; they are striated, and being compressed, have two edges; the lower part of the floret, where it is small, is yellow, but this part is not seen except when the flower is viewed at the back; the rest of the colour is as above described. The outside florets only, are quilled, the inner ones have their quills a little opened on their insides, and as they approach the centre they open more, but still keep the quilled character; the open part is spoon-shaped, and curved inwards; the whole centre is filled with florets so that the flowers may be called perfectly double. The colour of the foliage, both on the upper and under side of the leaf, is of a deeper green than is generally observable in these plants; the leaves are large, rather lengthened, and have only one deep indenture on each side, instead of two, as is usual; the divisions do not overlap, but are quite detached from each other; the serratures are much rounded on the top, and though they have a short mucro at their extremities, cannot properly be said to be pointed. The other figure in the engraving is of this plant.

3. *Expanded Light Purple Chrysanthemum.* This and the next are similar in their stems, foliage, and all points, except their blossoms; one having evidently sported from the other, yet they will probably be kept, and remain, as

distinct as has been the case with the purple and changeable white, and the rose and buff varieties, which are similarly circumstanced. The style of flowering in both has some affinity to that of the purple, but still they are so different in colour that they cannot be mistaken for the older sort by the most inexperienced, for the dark colour of the inside of the florets of the purple, and the grayish hue of their backs will always distinguish it. The stems of this kind are not particularly tall, they grow stiff, and throw out their branches more horizontally than other kinds, and these branches are in most cases terminated with a single flower. The blossoms expand soon after those of the preceding kind, and have a mild scent of Chamomile. The florets are a light reddish purple, and the colour on both sides is similar, those in the centre of the flower being somewhat darker. The expansion of the whole flower is two inches and a half or more. The florets, though slightly quilled at their base, are flatly opened the greater part of their length, and as seen in the flower appear entirely expanded; the expansion of its florets is the distinguishing mark between this and the next variety; the florets are numerous, and lie tolerably regularly over each other, very much in the manner of the Rose Chrysanthemum, except that they expand more, are wider extended, and lie flatter; this kind is also occasionally inclined to shew some disc in the centre of the flower, which is never observable in the Rose. The inner florets are considerably shorter than the outer, and consequently the whole are exhibited in the front views of the flower. The leaves are a dull pale green, deeply cut, broad, and short in proportion to their breadth; their serratures are very irregular, some being

much deeper than others; the ends of the serratures are sharp and pointed.

4. *Quilled Light Purple Chrysanthemum.* As this agrees in all points, except in the construction of its flower, with the preceding, it is not necessary to repeat their resemblances. The colour of the florets in the two is also the same, but in this kind they are perceptibly quilled to a certain extent, and this circumstance constitutes the difference between them; the quilling extends for half or two-thirds of the length of the florets, their mouths are expanded and recurved, but not spoon-shaped; the florets are rather broad near the base, they enlarge upwards, and do not contract much towards the top, the quilled part of the florets being flattened. From this description it will appear that the florets have not the perfectly quilled character; they are more properly expanding florets united part of their length, from their base. The disc, which is usually shewn, is at first tinged with green, and afterwards, when its florets open, is pale yellow; occasionally the tubular florets in the outer edge of the disc become purple and are then longer than those nearer the centre, their mouths being regularly expanded in a star-like fashion.

5. *Curled Lilac Chrysanthemum.* This is a brilliant and shewy kind, and appears to succeed in the open border, where it blossoms well and freely. The stems grow long and tolerably strong, the wood being rather pale; the branches spread out, and bear their flowers in clusters at the ends; they have very short joints. The flowers appear rather before those of the two preceding, and consequently, must be ranked with the early ones; they have the scent of

Chamomile, but not so strong as to be disagreeable. The florets at first are a rich lake inclining to purple in front, the backs are paler, and shine, but after a time the whole of the colour becomes paler. The expansion of a good flower is three inches. The florets are numerous and quite fill up the flower, leaving no disc, they are narrow, and appear most irregular in their direction when expanded, before they expand they are confusedly curled inwards, bending over each other, but after the flower has been fully blown, there remains no incurvation in the centre; the florets are quilled a little way at bottom, and then expand flatly, but do not remain in any uniform or orderly direction. The leaves are dullish green, small, deeply indented, and the lobes are distant; the serratures are rounded, and terminated by sharp points.

6. *Superb Clustered Yellow Chrysanthemum.* It is very striking in its general appearance, as well as handsome when more closely examined; it is excellent for the border, since the flowers shew conspicuously, and are not materially damaged by bad weather. The plant has a long strong stem, putting forth short branches, at the end of each of which is produced a cluster of yellow flowers, usually from four to six, their footstalks being very short, and consequently, when the blossoms are opened, the whole cluster seems like one large flower. It comes into flower rather later than the last, but still ranks with the early kinds. It has the usual Chamomile scent. The yellow colour is that of bright gamboge, and is the same over the whole flower; it is darker and more intense than the colour of either of our old yellow kinds. The flowers individually are small, expanding something more

than two inches; they are quite filled up with quilled florets of shortish and unequal length, projecting forward, and gradually diminishing towards the centre; the florets are flattened, enlarge upwards, and contract a little at the top, the mouth being wider than is usual in the regularly quilled flowers, occasionally some of the florets open their lips, forming small mouths of the extent of half an inch or more. I have observed in the open border, that in some cases, the florets expand quite flatly in the centre of the flower, and then only the outer florets are quilled. The leaves are a fine green, pale underneath, with indentures of no great depth, the lobes overlapping; the serratures, though broadly rounded, are sharply pointed.

7. *Semi-double Quilled Pink Chrysanthemum.* This is remarkable in being nearly single; it is, nevertheless, a striking and desirable variety; it is of tall growth, with rather weak branches, the flowers therefore droop; each separate branch bears several flowers; its time of flowering corresponds with that of the Superb Clustered Yellow. The flowers have a very strong scent of Chamomile, which is probably in consequence of their having such an extent of disc, for that odour seems to arise more from the tubular than the ligulate florets. The florets of the ray are numerous, but appear in regular single series; each is from one inch and a half to two inches long, being almost, though not quite, uniform in length; they expand widely, but project a little forward, being slightly striated, and rather flattened; they are white, irregularly touched with pink, that tint being darkest at the back; they are slender, and quilled to near the end, and somewhat club-shaped; their mouths, which are

small, sometimes expand more or less in the form of a spoon. The disc of the chief or centre flower of each branch is about three quarters of an inch wide, semi-globose, and made up of small yellow florets; the secondary flowers have a much smaller disc. The leaves are a shining green, very different in character from all others; they are deeply divided at the bottom, but less so at the top; the larger divisions of each leaf are distinct, and much lengthened, with fewer serratures than in any other known variety, these are quite sharp, and not in the least rounded.

8. *Semi-double Quilled White Chrysanthemum.* This is a large flower, but does not possess much to recommend it, excepting that it is very different from all the others. The flowers have the appearance of a very large *Ox-eye Daisy.** The stem grows strong and high, and has an inclination to form branches which bear flowers the whole of their length, and not towards the top only. It blossoms at the same time as the Superb White. The scent of the flower from whence this description was taken was not so strong as either of the two preceding, but this might have arisen from the plant growing in the border. The expansion of the flower is nearly five inches, the florets of the ray are pure white, and are ranged in a double series, being two inches and more long, and nearly all of the same length; they are quilled from half to two-thirds of their length, the lip is flattened, slightly inclining to be spoon-shaped; the direction of the opening is singular, it faces different ways in different florets, in some towards the back, in some sideways, and in others, though less frequently, to the front of the flower. The disc is very large, conspi-

* Chrysanthemum leucanthemum, Eng. Bot. page 601.

cuous, semi-globose, and made up of yellow tubular florets. The leaves are very different from those of any other kind hitherto described, they are long, and hang downwards, having a very ragged appearance, which arises from their sides being curved backwards; this also causes them to look narrow; they are, however, tolerably wide; the principal incisures are shallow, and their edges rather overlap; the serratures are few, not deep, but very sharp and pointed.

The three remaining plants have not flowered sufficiently to enable me to describe them correctly; one seems to be semi-double, with quilled orange flowers; the second is also semi-double, with half quilled lilac flowers, and the third is probably only a duplicate of the Quilled Pink.

In my former paper,* I mentioned that Mr. Brookes, of Ball's Pond, was in possession of three newly imported Chinese Chrysanthemums, which had not then blossomed so as to be distinctly known. One of them has since turned out to be the Tasselled White, another has only produced imperfect flowers, but from what it has borne, it is concluded that it will probably be different from any other yet known, and have red or pink half-quilled florets. A plant of the third, which Mr. Brookes obligingly gave to the Society, has blossomed well, though very late in the season, but it turns out to be more a matter of curiosity than of beauty.

This new plant must be called the *Small Yellow Single Chrysanthemum.* It is so different from the others that it will not suit to be mixed with them, and those who possess it should keep it separated from these more brilliant plants.

* Horticultural Transactions, Vol. iv. page 335 and 354.

The stem is light brown, not strong, of moderate length, and slender; small branches spring from the top of the stem; these are furnished with leaves their whole length, which diminish considerably in size towards the termination of the branches; the flowers are produced at the end of the small branches in corymbs of few flowers, or footstalks, two inches or more long, bearing one or more small bracteæ. The involucrum or calyx of the whole flower is similar to that of the larger kinds, but smaller. The florets of the ray are about eighteen in number, bright yellow, slightly projecting, marked with one or two notches at their apex, and nearly half an inch long; the disc averages half an inch across, forms a globular head, and is covered with yellow tubular florets exactly of the same colour as the rays; the receptacle is conical and quite free from paleæ. The scent is more that of a Pyrethrum or Feverfew, than of a Chamomile. The leaves are much more deeply divided, and have their serratures sharper and more numerous than in the large flowering Chrysanthemums. The whole of the leaf, both on the upper and under side, is covered with short wool-like hairs, giving it a downy appearance.

There are many parts of the description of this plant, especially in its leaves, which seem to separate it from the large Chinese Chrysanthemums; it blossomed so much later than they did, that I had not an opportunity of comparing them together when equally perfect in flower, but I think it will not be doubted that this is one of the plants which was described by Linnæus as the Chrysanthemum Indicum, and that to it are also referable the plants described or noticed by the several writers whom Linnæus quotes as authorities

for his plant. I am decidedly of opinion that he did not intend to include our Chinese Chrysanthemums under his Chrysanthemum Indicum, and have stated my reason for this opinion at length in a communication to the Linnean Society,* but whether his plants and our large Chinese Chrysanthemums are to be considered as one species still remains to be determined.

In my description of the two new semi-double Chinese Chrysanthemums I did not mention the state of the receptacles; in both cases they are without paleæ, whilst all the full double flowers which I examined for the purpose in the last season had more or less of these processes. It is, therefore, clear that the addition to the receptacles of the double flower is produced by the same cause which converts the tubular florets of the single flower into ligulate florets. This fact establishes the correctness of the opinion of those who retained the Chinese Chrysanthemum in the Genus Chrysanthemum, and the error of those who removed them to Anthemis.†

Should it be agreed that the small Yellow Chrysanthemum is the Chrysanthemum Indicum of Linnæus, and that it is distinct as a species from our Chinese Chrysanthemums, a new specific name must be given to these plants. I am disposed to think that the semi-double White variety, if it be not the original, is not far removed from the wild type of our beautiful collection, and that a correct botanical comparison of this with the small Yellow Chrysanthemum will settle the controverted question.

* See Transactions of the Linnean Society, Vol. xiii.

† See Horticultural Transactions, Vol. iv. page 327.

At the beginning of this Paper I described the advantages which these plants afforded to the possessors of glazed houses, but I must not be understood thereby to discourage the planting the Chinese Chrysanthemum in the open border where several of them flourish, and even continue flowering late in the season, though their beauty is much prolonged by the shelter of a house. Of the old sorts the Rose and the Buff are most commonly planted in the open border, besides these, the Purple, the Changeable White, and the Golden Yellow do well under similar circumstances, and the Superb White, and Tasseled White also blossom well, late, when planted out. Of the new varieties, the Superb clustered Yellow, and the Curled Lilac will answer best for the same purpose, and with these the Semi-double White may also be planted.

To look well in the border, the plants should be large, and with many stems; their flowers are consequently more numerous, and produce a greater effect at a distance. The appearance of the flowers on many of the kinds is very different when blossoming in the borders from those which expand under glass, so much so, that they might be easily mistaken by an unexperienced observer for different varieties. My descriptions, in all cases, except that of the Semi-double White, has been made from housed plants.

XIII. *Some Observations on the* Fruit of Fig trees. *In a Letter to the Secretary. By Sir* Charles Miles Lambert Monck, *Bart. F. H. S.*

Read February 6, 1821.

Dear Sir,

I have delayed writing to you till the Fig-trees in my glass-house should have done all which they could in this season. This they have now done, and though my observation of them has not enabled me to ascertain all which I hoped, yet I have learned some particulars, which I will communicate.

I have four kinds of Fig-tree in my garden, which were obtained from a neighbouring nurseryman, about twenty years ago. I do not recollect all their names, but amongst them was a Green Ischia, and one, which I could always distinguish, was the White Marseilles. These four trees were planted against a flued wall, of south aspect, carefully covered from frost in winter, and trained to the wall in summer. They all, except the White Marseilles, have put out every year, since the fourth or fifth after they were planted, plentiful crops of spring Figs, but never ripened any. Their fruit has always turned yellow at the end of June, and dropped early in July. The White Marseilles kind used to put out no spring Figs, but plenty from its spring shoots in summer. These were immature at the fall

of the leaf. After many years of such failure, and being told by my friends, that the trees cast their fruit, because the climate was not warm enough to bring it to perfection, I began to investigate the cause myself, and my first conclusion was, that most probably they did not cast their fruit because the climate was not warm enough; for they cast them at the warmest part of summer, and particularly the Figs, I always observed, came out very healthy of complexion, and advanced rapidly to a certain size, at which they invariably began to turn yellow, and soon after dropped. If they had remained on the trees, and ripened imperfectly, or been immature at the fall of the leaf, as the summer crop of the White Marseilles kind, climate might have been blamed. Conjecturing other causes of failure for the other trees, I tried changes and experiments on the soil, and in their treatment, but all in vain.

Four or five years ago, I had a Fig-tree given to me by Earl Grey, of a kind, which bears ripe fruit at Howick, thirty miles north from hence. Lord Grey had received the kind from the Earl of Lauderdale, who lived at Dunbar, in Haddingtonshire, and I believe it is that kind, which is common in the gardens of that neighbourhood, bearing plenty of ripe fruit in them. This tree began to bear in the year 1819, and both then and this year brought spring Figs to great perfection; they are purple. Four or five years ago, I took up the White Marseilles Fig-tree which stood against my garden wall, and moved it into a conservatory, and placed it against the back wall: after a year it began to bear, and has ever since borne crops of very perfect summer Figs,

though few in number, and small: and last year and this, a few spring Figs.

About the same time, I put into the same conservatory, a plant of one of those kinds against my garden wall, which were used to put forth spring Figs and cast them; after a year or two of growth, this began to bear, and failed in the conservatory exactly as it had done in the open air. I now felt certain, that the casting of the fruit was not owing to defect of climate. This year, 1820, it put out an abundant crop of spring Figs in March, they all dropped in May; in June it put forth another crop, these began to drop at the end of September, and have continued to do so till now, when the leaves are fallen.

Having prepared you with this account, I come to my remarks.

When the failure of fruit in the conservatory as certainly as on the garden wall, made me sure that defect of warmth was not the cause, I was led to suspect, from the constant advance of the Figs to the same state, and as constant failure when they came to it, that it was defect of setting. I am no botanist, but know the stigmas, and the stamens with their anthers, and the offices of each. This spring, when the Figs on that Fig-tree in the conservatory, which casts its fruit, were half grown, I cut one open, and with the assistance of a microscope, found that it contained, next the eye, many florets, having full sized anthers. The remaining part of the Fig, was occupied by florets containing each one stigma. These last florets were small in proportion to the other kind, though much more numerous. The

whole fruit was squat-shaped, and being cut open appeared thus :

Anther-bearing florets being in the upper part and the bottom occupied by puny stigma-bearing florets, amongst which here and there a half perfect anther-bearing floret occasionally exists ; many of these Figs dropped when half grown, others at different increased sizes. Those which remained on latest seemed to make an ineffectual effort to ripen. They swelled suddenly, but only a little, and acquired somewhat of the complexion of a ripe Fig ; but when cut open, shewed the anthers grown much larger, though become dead and dry ; the stigmas no further advanced than in a half grown Fig ; and the part at the root of these last, which ought to be the pulp, was become a little moist, and had acquired a very slight smell of the ripe fruit, but was not sweet, or even eatable. I opened every spring Fig, which dropped from this tree, and found them all as I have described. When the summer crop came out I found some variation. A few dropped at half size: the others stayed on, and made the ineffectual swell. I observed, upon opening them, that, those, which stayed longest, swelled most ; acquired most

of the complexion of a ripe Fig; had their anther-bearing florets small and least numerous, their stigma-bearing florets much further advanced in size and perfection than any which were contained in Figs of the spring crop; they even appeared to contain very small seeds.

For the benefit of comparison, I cut open half grown spring Figs of the White Marseilles tree in the conservatory, and of the Howick Fig tree against the garden wall; these displayed arrangements of their insides similar to each other; but quite different from those of the other Fig; their anther-bearing florets were small and imperfect, occupying a very small space round the eye. Their stigma-bearing florets were large and perfect, and filled up the inside of the Fig. In the other Fig, the stigma-bearing florets were like velvet, lining the lower part of the Fig, and so short as not to meet, but to leave a vacant space in the middle of the Fig. The White Marseilles and Howick Figs were not squat shaped, but long like a Pear, and when cut open appeared thus:

The anther-bearing florets few and puny, the stigma-bearing florets numerous and large, filling the whole Fig, so as to leave scarcely any vacant space in the middle. Observe upon the difference of the shape; the anther-bearing florets always grow next the eye of a Fig. If they are to take the lead in a Fig, the part from which they grow will naturally be large, and the part where puny stigma-bearing florets grow will be small; hence arises the squat shape. If the stigma-bearing florets are to take the lead, the part from which they grow, which is the end next the stalk, will be large, and that part next the eye, where the puny anther-bearing florets grow, small; hence arises the pear-shape. This observation will enable us to pronounce the internal arrangement of a Fig for fructification, from a view of its external shape, and if observations of further varieties of Fig, should accord with these which I have made, we may tell by the shape of the Figs, which a tree puts forth, whether it will bear eatable Figs or not.

My experiments and observations, on the whole, have enabled me to ascertain, that the barrenness of Fig-trees on a garden wall in this climate may arise from other causes than defect of warmth; for the tree moved from the wall into the conservatory behaved no otherwise than to do there in May and September, what it had been used to do on the garden wall in August, and the end of October.

They also have led me to conjecture:

1st. That Fig trees never bear Figs which contain both kinds of florets in an efficient state.

2nd. That Figs in which the anther-bearing florets only are perfect, never come to be eatable fruit.

3rd. That you may pronounce, from the external shape of a Fig, which kind of floret prevails. The stigma-bearing in the Pear-shaped: the anther-bearing in the squat Figs.

4th. That Fig trees, which put forth crops of Figs, and cast them, most probably do so from defect of setting.

Believe me,
dear Sir,
Your's, with much obligation,
CHARLES MONCK.

Belsay, Northumberland,
November 12, 1820.

XIV. *On the Effects produced by* Ringing upon Fig Trees, *with Observations on their Cultivation and Propagation. In a Letter to the Secretary. By Sir* Charles Miles Lambert Monck, *Bart. F. H. S.*

Read December 4, 1821.

Dear Sir,

In a Letter,* which I wrote to you last year, about Fig trees, I reported the effect produced on one by *Ringing*, which, if I recollect right, were described to be as follows: that the stem of the tree below the ring ceased to swell; but above it, encreased certainly as fast, apparently faster, than before; that the branches which subsequently sprouted forth were shorter jointed; that the trees put forth Figs in spring and at midsummer in such abundance as to bear eight or ten on some branches of as many inches in length; and, that though the Figs grew fast, and appeared large and healthy, the tree (which was one of those which I have before described as dropping their fruits before they were mature) shed them all, as it had been used to do before it was ringed, and ripened none.

I had hoped two things from the ringing; first, a more abundant production of fruit; secondly, the sustenance of

* The Letter alluded to, is that which is printed at page 163, of this Volume, but that part of it which contained the observation on ringing was omitted in the printing, because the substance of the passage was repeated and extended in the present Letter. *Sec.*

the fruit to ripeness. My first expectation was realized; the tree put forth its Figs of each crop in much greater numbers than before, so that it was not uncommon to see two Figs at one joint. My second expectation was in vain; all the Figs were shed, without having become eatable fruit. I opened the greater part of them, and found them full of the withered anthers and stamens, of anther-bearing florets growing next to the eye of the fruit, and of stigma-bearing florets in their lower part; these last were small, and appeared as if they had ceased to advance at an early period. I conjectured that the ringing had caused my tree to put forth Figs much more abundantly; but not to change its habit of producing Figs, whose staminiferous florets only should be perfect and their stigma-bearing florets abortive. Shortly after this, I read your paper on ringing Fruit trees, printed in the Society's *Transactions*,* where you observe, "in none of the experiments the termination of which I have yet become acquainted with, has success attended the operation of ringing the Fig tree;" and you add, that, though the consequence has been an abundance of Figs put forth, yet the crop has fallen off without ripening. This account made me distrust my conjecture. The experience of another year has cleared up the matter; I can now venture to report, that ringing may be practised upon the Fig tree with as much safety, and more effect in the increase of number and size of its fruit, than on the Pear tree. My tree of the White Marseilles Fig, which stands in a border within a small conservatory, and is trained against the back wall, grew for several years luxuriantly, and produced few and small, though perfect

* See Vol. iv. page 127.

fruit. Some of its branches were ringed last year. This summer, it brought some spring Figs to maturity, but they were few. I believe the crop had mostly been protruded in the autumn, and had fallen off in the winter. After midsummer, it put forth a most abundant crop of summer Figs on the spring branches of the ringed limbs: six, seven, and eight Figs on most of these branches; indeed, all the branches, which had been sprouted forth this spring on the ringed limbs, produced a Fig from almost every joint, and from some joints two; so that, when they came to swell and ripen, many touched each other. They began to appear about the end of June, and to be ripe about the beginning of October. They were double the ordinary size, and of good quality; the tear appeared at the eye when they were ripe, and even dropped from some. When they were about a quarter grown, I split one down with my knife, from the eye to near the stalk, and into the cleft I stuck a small bunch of anthers cut out of a Fig from an anther-bearing Fig tree, which was growing against the garden wall, and had at that time its anthers within the Figs mature. This split Fig appeared to suffer no damage from such treatment; but continued to increase in size, and became ripe on the 23d of August, about six weeks before all the other summer Figs on the tree; though there were several on the same branch both above and below it. One thing was observable, and, I think, was a consequence of the Fig having been split: when it had made its last swell, and the germs had become pulpy, they speedily became mouldy, and the mouldiness spread to the outward coat of the Fig, so that it could not be permitted to hang on the branch till dead ripe, in which state Figs

are best for eating. Some of the seeds which it contained were apparently perfect; for, when the whole fruit was mashed and mixed with water, some of them sunk, and others swam. I sowed those which sunk: perhaps they may rise next spring.

The Figs of the second or summer crop, which I have gathered this autumn from some ringed branches of this tree, covering about fifty-four square feet of wall at the back of the conservatory, exceed two hundred in number. Those branches of the same tree, which had not been ringed, bore very few Figs, and those few did not swell to above half the size of the other, though they were not deficient in flavour. The rings cut were about a quarter of an inch broad, and they closed for the most part the same season by reproduction of the bark.

The Fig tree, I believe to be, of all the fruit trees which we cultivate in our gardens, the least understood; but, to those who may have acquired a knowledge of its habits, the most tractable. No tree is propagated more easily. I sent down in April last to this place, from London, two cuttings of Figs. They were so small as to travel by the post in a common letter-cover. I have gathered this autumn from one of them three ripe Figs, and two from the other.

The Fig tree may be checked in its useless habit of luxuriant growth by ringing, so as to become fruitful at a very small size.

It may be forced by heat, and liquid manure, with copious irrigation, so as to support an abundant crop of fruit, and bring them to perfection to a greater extent than any other tree.

Spare branches of a large Fig tree growing out of doors may be ringed, and surrounded by a small pot of earth, into which they will speedily strike root, so as to bear being separated in autumn from the tree; and then may be used to furnish any glass-houses with trees to bear fruit through the next summer. I believe, too, that the Fig tree may be easily propagated by inoculation, if that should be desired. Three buds which I inserted into succulent branches of a Fig tree within doors last summer, continue alive now in November.*

I am, dear Sir,

Your's very sincerely,

CHARLES MONCK.

Belsay, Northumberland,
November 30*th*, 1821.

* April 9th, 1822. Of these, two are now sprouting.

XV. *On the* Mildew *and some other* Diseases *incident to Fruit Trees. In a Letter to the Secretary. By Mr.* John Robertson, *F. H. S.*

Read November 20, 1821.

Sir,

I am induced to trouble you with some observations, which I have had an opportunity of making *on the Diseases of Fruit trees*, in the hope that they may add somewhat to the experience we have already acquired, on this most important branch of Horticulture, being of opinion that the different appearances, which they assume under different circumstances, render it necessary to combine information from various quarters, in order to attain a perfect knowledge of their nature, and enable us to lay down such rules for their treatment, as may be generally useful.

As the Peach tree is one of the principal objects of garden culture, I shall chiefly direct my attention to it at present. The diseases which prove most fatal to it in this climate, are the *Mildew, Blight,* and *Gum;* respecting the nature of the first, a variety of opinions have been entertained, and it has been a question, whether it was of animal or vegetable origin, or a fortuitous production; but it is now generally admitted to be a parasitic fungus, and that those parts of it which are apparent, form the fructification. Its seeds, when mature, from their extreme minuteness and levity, are dispersed to a considerable distance in every direction, and such as happen to be

deposited under favourable circumstances, speedily vegetate, and in their turn rapidly extend themselves. The species of Mildew which attacks the Peach, appears to confineitself to that class of trees alone, and differs obviously from those species which may be observed to grow on the leaves of the Apple, Pear, Hawthorn, or such other plants as have come under my observation, in its greater size and luxuriance. To the naked eye in the earlier stages of its growth, the Mildew seems a hairy down, which, seen through an ordinary magnifying glass, is erect and crystalline; at a later period, its stems appear flattened like a web to the leaf, to the exterior part of which it attaches itself, before it is unfolded, and principally confines itself afterwards to that part, it being more tender and spongy, than the inner or upper side, and affording a fitter nidus in which the germinating seed may establish itself. The leaf so attacked, never expands perfectly, by which means an experienced eye may readily distinguish the disease on its first approaches; from the leaves the Mildew extends to the tender extremities of the young shoots, and fruit, and finally destroys the tree, unless arrested in its progress by timely attention. Of the two classes of Peach trees, those which have glands and those which are devoid of them, the former is but slightly, if at all, affected by the disease in these climates, in consequence, probably, of their possessing a closer and firmer cuticle, which is impervious to the seed of the mildew; and of the latter, some sorts are liable to it in a much greater degree than others, particularly the Red Magdalen, one of our very best kinds of Peaches.

That the disease is contagious I have always had reason to

suppose; but, for the purpose of ascertaining the fact with more precision, I last summer attached some young shoots infected by it, to two distant branches of a Red Magdalen Peach tree, that was perfectly free from the disorder, and grew on an eastern aspect; the weather was then dry and warm, and the wind south-easterly. After some time, the Mildew made its appearance, on those parts of the tree to which the shoots were fastened, and continued to extend itself there, for the remainder of the season, but on repeating the experiment, with as much attention in every respect, as before, on a tree growing on the western or opposite side of the wall, it failed to produce any effect, in consequence, I apprehend, of the weather having become moist and cool, accompanied by a westerly wind, which prevented the ripening and dispersion of the seed.

This year, 1821, I again repeated the same experiment, on the western aspect, but no appearance of infection shewed itself until an interval of four or five weeks had elapsed; I then observed the Mildew on a shoot below that to which the infected one was attached, and with which it came in contact. These various results tend to prove how much the appearance of this disorder depends on contingent circumstances.

The following instance also affords me reason to suppose, that the seed of the Mildew is not absorbed, and circulated in the vessels of the plant, to be again developed at a future season, but rather preserved, by adhesion to its external surface, until a favourable opportunity may present for its vegetation. Last autumn a lot of maiden Peach trees in my possession, were severely injured in their tops by the mildew, but as the plants were excellent in every other respect, I this

spring, after heading them down low, planted them to a new wall, apart from any others; they have since thriven well, and out of the entire (about fifty) the disorder made its appearance on one or two only, though all seemed infected in an equal degree in the preceding year.

The following is also an additional proof, that the disorder is communicated by the dispersion of the seed, and that Peach trees with glandular leaves are not equally liable to the contagion as others. Having planted this year a collection of Peach trees, which I had obtained from France, (about thirty sorts) in one of my houses, they grew remarkably well until the latter end of the season, when, having occasion to open an end sash, near which, on the wall without, a mildewed Peach tree stood, after some time the disease made its appearance on one or two glandless trees, the only ones, of that description, in the house, at the same time the remaining sorts continued perfectly free from attack.

Such are the appearances which the Mildew presents in those countries, but in warmer climates and higher temperatures, it assumes more virulence, and in a greater or less degree affects all varieties of the Peach, with few exceptions. A warm dry state of the air appears essential to its growth and extension, which, on the contrary, is checked and repressed by a cool moist atmosphere.

Dangerous and destructive as this disorder is, to the Peach tree, yet it is satisfactory to know, that it may be rendered innoxious, and removed by the timely application of sulphur, the only remedy, which I am acquainted with, that can be termed a specific for the complaint. Soot and lime I have tried with very little effect, but sulphur being so easily procured, and

applied with so little trouble, it is unnecessary to have recourse to any thing else; it is usually prepared by mixing it with soap suds, and then applied by dashing it violently with a rose syringe against the tree and wall, in such a manner that no part or leaf is left unsprinkled; the viscidity of the seeds attaches the sulphur to the leaves of the tree, as well as to the wall, and as the sulphur lies sheltered in the crevices of the brick work, it emits powerful effluvia for some time, which, it is probable, operate, besides the contact of the substance, in destroying, by its corrosive property, the tender fructification of the mildew.

When trees have been severely attacked by the disorder, they should be syringed on the first unfolding of the leaf, and at frequent intervals during the remainder of the season, perhaps once a week. By the continuance of such treatment, and close cutting out the infected shoots, it will be completely subdued and eradicated, though such leaves as have been injured, will still continue to retain the appearance of disorder. The sulphur, instead of being in any degree hurtful to the Peach tree, seems rather to promote its growth. The collateral autumnal shoots being particularly liable to catch the infection, should be carefully nipped off as they push.

Blight. Under this denomination are frequently confounded two varieties of disease materially different in their appearance, and which I shall distinguish by the appellations of *Blister* and *Curl:* the former is generally confined to such Peach trees as have glandular leaves, which are mostly subject to it in the months of April and May, and when attacked, it is not until the latter part of the season, if at all, that they become healthy and convalescent. The leaves of trees so

attacked are crisp, and assume a swollen, crumpled and succulent appearance; the shoots themselves are affected by it in the same manner, and never produce either good blossom or healthy wood. It is probably occasioned by the sudden contraction or destruction of the vessels, and extravasation of the sap, when cold chilly winds and frosts immediately succeed warm sunshine, and soft genial weather; in such case, the diseased shoots should be rubbed off where they can be spared; where not, the tops should be pinched down to that healthy part, which is generally at their lower end; and from the remaining eyes, fresh shoots will push in sufficient time to ripen perfectly.

The Curl principally attacks those sorts of the Peach, which have leaves deeply serrated and devoid of glands, and it probably proceeds in part from the same causes which occasion the blister, aided by the operation of drying winds. The leaves and tops of the shoots affected curl up and emit a saccharine secretion, which attracts the Aphides, these, by extracting the juices of the leaves and shoots, destroy them, and the tree consequently perishes.

Mulching round the stem of the tree, and keeping its head and the mulch moist by watering, will act as a preventive, or restore it to its health. The insects should be destroyed by fumigation with tobacco, or by washing the tops of the shoots with tobacco water, or by sprinkling them with snuff after watering.

Gum. This complaint is of frequent occurrence, and proceeds from a variety of causes; and it is a more formidable enemy than either Mildew or Blight; being in most cases incurable. It may be distinguished in the early stages of its

progress, by brown or rusty spots appearing on the young shoots, which frequently gum, and die off the same season: should they survive, in the following spring these spots becoming blotches, open, and bleed, the wound expands, and the virus gradually corrodes the adjoining parts, until it encircles the branch and destroys it. The cankered part, when cut transversely, exhibits the pith, alburnum, and rind, all tainted by the vitiated sap, which may be traced from the point where it takes its rise, by its discoloured tint, to the wound whence it issues and forms gum; it is rarely confined to a few parts, but circulates through, and affects the whole system to the extremities.

Gum is the consequence, either of the plant being propagated from a diseased stock; or, if healthy originally, of the tree being planted in an unsuitable soil or situation; old gardens long worked, exhausted of that freshness so congenial to the Peach, and saturated with acrid and corroding manures, rarely afford healthy Peach trees; cold clayey ground retentive of moisture, and such as have a sour or ferruginous substratum, which chills and cankers the roots, are equally pernicious to the Peach tree; on such it generally throws out strong spongy and ill ripened shoots during summer, which possessing a superabundance of crude watery juices, are frost-bitten in winter, and gum and perish the ensuing season.

Cold raw summers also, in which the mean heat is below the temperature necessary for the Peach tree to elaborate its sap, or enable its vessels to perform their secretions perfectly, always tend to produce gum and canker in fruit trees.

Disease also proceeds from wounds, or other external injuries, of which the Peach tree is susceptible; in all cases,

except that of wounds, topical applications fail in producing any permanent good effect; but where they are resorted to, the edges of the wound should be pared to the quick, all the carious parts cleaned out, and the whole covered with some durable composition, which will adhere and effectually exclude the air and moisture, in which, I believe, consists all the efficacy that any application can possess. One of the best, and most readily provided, is a mixture of tar and powdered charcoal, sufficiently fluid to be laid on with ease: perhaps as charcoal has been found a powerful antiseptic, it may have some effect in counteracting a tendency to putrefaction in the wound.

When trees which have been previously in a sound state, first shew symptoms of Gum, in consequence of having been planted in an unsuitable soil, they should be taken up as soon as possible, and better mould substituted, by which, clearing out the diseased shoots, and forming the future growth of the tree on those that are sound, the disorder may be checked, and the existence of the tree prolonged.

But as all attempts to remove this disease, when it has once taken head, are likely to prove ineffectual, no precaution should be omitted to prevent its occurrence; the Peach borders should be carefully prepared, by forming them of a sweet fresh soil; where the ground is not naturally such, the best possible is the upper spit of an old upland pasture. The bottom should be drained, where requisite, to free it from stagnant moisture, and rendered impervious to the roots, should the subsoil be wet. Where these or similar precautions cannot be taken, replanting the trees occasionally, in order to keep the roots on the surface, has been found productive of the best effect.

The border should also, where that sacrifice can be made, be left in possession of the Peach tree alone, and worked with forks only, to avoid injuring the roots; but as devoting so valuable a portion of the garden as the south borders to no other purpose, may not in many cases be expedient, it would be adviseable to leave apertures at the bottom of the wall, through which the roots of the Peach tree may penetrate to the outside, and be there suffered to range unmolested. Brick walls are preferable to those formed of any other materials, as they are not only drier and possess a more equal temperature, but in consequence of their colour absorb and retain a greater portion of heat than most others.

Copings proportioned to the height of the wall, should always be laid on its top, as they not only protect the bloom, but keep the wall dry and warm, and so facilitate the ripening of the fruit and wood. Little or no manure should be given to the Peach tree while vigorous, or until weakened by age or bearing, and the object in pruning should not be to produce strong luxuriant shoots, but such as may be kind and fertile, which completing their growth early in the season, will be well ripened.

Such course of treatment steadily pursued, will rarely fail to render the Peach tree healthy and productive.

The Apricot, Plum, and Cherry, are also subject to Gum; to the first, it frequently proves destructive, but to the others it is less injurious. The instructions which have been given relative to its treatment in the Peach tree, will also equally apply to it in these trees.

Of the other diseases to which fruit trees are subject, the most injurious is the Canker. In the Pear and Apple, pro-

ceeding from the same causes as Gum in the Peach, it resembles it in its progress, and is equally fatal in its termination. From the strong similitude their features present in common, we may consider them as diseases of the same class, though altered in their symptoms by the peculiar organization of the different plants, and the same remedies and precautions which have been prescribed in the one case, are generally applicable in the other. The Pear and Apple, however, possess the advantage of having some varieties much hardier and less liable to canker than others; these, though in general of inferior quality, may, in case of the failure of choice sorts, be grafted on them, and succeed perfectly well where the others would perish.

Being of opinion that no small proportion of both Gum and Canker, which are unfortunately so widely extended, have proceeded from the trees having been incautiously propagated from diseased stocks, by which means many valuable varieties of fruit have been brought into undeserved disrepute, I feel that I cannot too strongly impress on the mind of the cultivator, the necessity that exists for his using the utmost precaution in the choice of scions for grafting or budding, and that none should be employed but such as are taken from trees perfectly healthy and free from these complaints, otherwise they will be most certainly transferred, and the diseases in that case perpetuated.

Independent of any other cause, some sorts are, in consequence of their conformation, diseased from the seed, such, no skill or circumstances will ever render healthy.

Old age, though not properly a disease in fruit trees, but the last stage of existence, which, in common with that of all

other organized beings, contains the germ of decay in its bosom from its birth, yet as it is accelerated by adventitious circumstances, so may it also be retarded by art.

A tree though planted in the most favourable situation, and enjoying in youth the most perfect health, must nevertheless experience in time infirmities proceeding, amongst other causes, from the increasing difficulty with which the head draws its supplies of nourishment from the roots, as the distance between its extremities becomes more lengthened, and its vessels become more rigid and obstructed; but by grafting the young shoots on young stocks, these defects may in a great measure be done away, a new vigour imparted to it, and its existence prolonged to an indefinite term, when compared with that of human life.

I remain,

Sir,

Your very obedient Servant,

John Robertson.

Kilkenny,
November 16, 1821.

XVI. *Description of a* Method of Training Standard Apple Trees. *By* Joseph Sabine, *Esq. F. R. S. &c. Secretary*

Read October 1, 1822.

In a visit which I lately paid to the garden of Joseph Brookhouse, Esq. at Warwick, I was much pleased with a *method of training Standard Apple Trees,* which he has lately adopted. Mr. Brookhouse has for many years amused himself by practical attention to various branches of Horticulture, and his forced Grapes and Peaches are so excellent that they may compete with those of the most distinguished professional cultivators, without danger of suffering in the comparison, either as to the qualities of the fruit or the appearance of the trees which produce it.

The Apple trees alluded to are six feet high in the stems, from the tops of which, the branches, which are of three or four years growth, extend outwards, and nearly horizontally in all directions, from five to six feet from the centre. Round the tree, at about three feet from the stem, and at two feet from the ground is placed a hoop, fastened to stakes, and towards this hoop the ends of the branches are directed by worsted cords fastened to their extremities, and to the hoop. The branches, by this means, assume a curved direction, straighter near to their origin in the centre, much arched afterwards, and having their extremities turned inwards. The average distance from the ground to the ends of the

branches thus secured is about four feet. The general outline of the tree has much resemblance to that of a balloon, and the cords which are attached all round to the hoop in a slanting direction inwards, increase the similitude.

After the fruit has been gathered, the fastenings are removed; in winter the trees are pruned, the upright shoots which have been made, are shortened to spurs, except where fresh branches are wanted to complete the uniformity and regularity of the whole, and in spring the operation of tying is repeated.

As the trees increase in size, the distance of the hoop from the stem of the tree will of course be increased; but I conceive, that by proper care and attention to the pruning and laying in of the young branches, the whole will continue to preserve the direction and figure given when young, even to an advanced age.

It is scarcely possible to conceive a row of trees in a garden more beautiful than one thus arranged, not only from the uniformity in size, and regularity of growth of the trees, but from the beautiful display of blossoms and fruit in the different seasons, occasioned by this peculiar mode of training, which is calculated to exhibit the whole so perfectly.

The advantages of the plan are many and important. The downward inclination given to the branches increases the disposition to form blossom buds, and consequently to produce more abundantly; the foliage is well exposed to receive the influence of the light and air; the fruit is uniformly distributed over the surface of the tree, and does not suffer from

being shaded by irregularly placed branches; whilst the ligatures at the ends of the shoots keep the whole so steady, that they are never so agitated by wind as to lose their crop prematurely, nor do the branches suffer like those of other trees, by lashing each other in strong gales of wind.

XVII. *On the* Construction of Strawberry Beds. *In a Letter to the Secretary.* *By* William Atkinson, *Esq. F. H. S.*

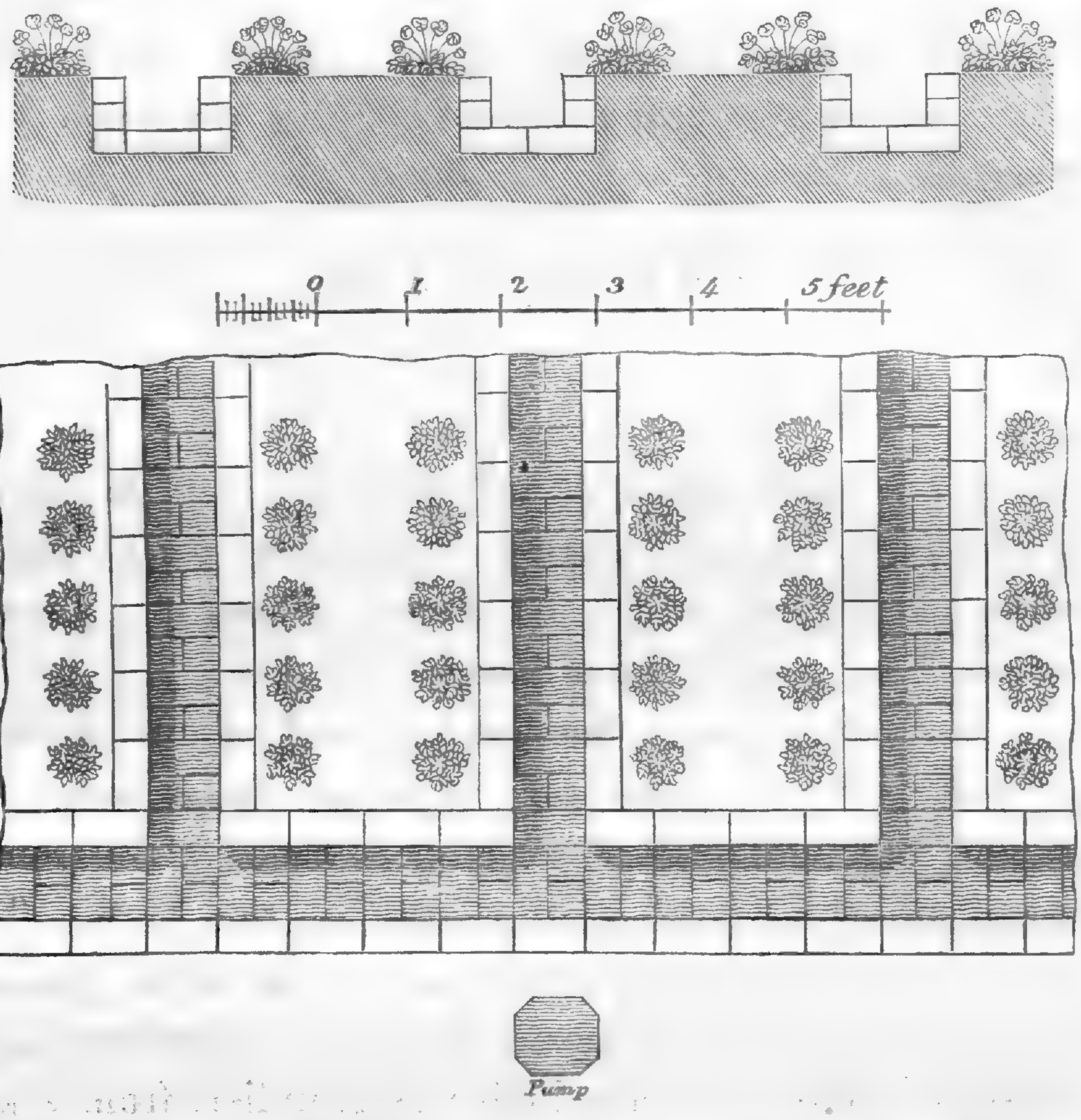
Read September 3, 1822.

Dear Sir,

Some years ago I happened to see in a small garden near Chatham, a *method of making Strawberry beds,* which I thought a good one; and as I have never seen it in any other situation, I here send you a description of it.

The beds were upon flat ground, each about three feet wide, and between them were trenches about nine inches wide, and four-inch walls of brick on each side of the trenches, to keep up the earth on the sides of the beds. These trenches were about the depth of two or three courses of bricks laid flat, without mortar, and were intended for the purpose of holding water, which was supplied from a pump whenever the ground was dry, while the plants were in fruit. By this method, I understood, a much greater crop of fruit was obtained, and the plants continued bearing much longer, than in beds where there were no trenches for water. According to this plan, a considerable quantity of Strawberry ground is watered with very little labour, and it has the advantage of letting the water to the roots of the plants, so as to keep the ground moist without hardening the surface, as is the case when the tops of the beds are watered with pots.

The annexed section and plan of the beds will explain how they were constructed.



I was informed some years ago by a gentleman from Devonshire, that he was in the habit of constructing Strawberry beds (which he called Strawberry walls) against the side of a hill or bank, by building up beds in steps, with rough granite at the front, to keep up the earth, each step being about two feet high and three feet wide. These steps were filled with good loam, and the surface of each was covered with rough pieces of granite bedded into the loam, leaving openings between the stones, just sufficient to put in

the plants. This plan, I understood, answered much better than the common beds.

I conceive that the surface being covered with granite, would keep the ground longer in a moist state, and the fruit would always be clean. I should expect that chippings of stone, such as may be had from the masons in London, might answer the same purpose. I have found a great advantage in keeping the fruit clean, by laying a row of common bricks on each side of the rows of Strawberry plants; I tried plain tiles, but found bricks answer better, as the tiles are apt to be broken in gathering the fruit, and will not do to use a second time.

I am, dear Sir,

your most obedient and faithful servant,

William Atkinson.

Grove End, St. John's Wood,
August 14, 1822.

XVIII. *Instructions for* Packing living Plants in Foreign Countries, *especially within the Tropics; and Directions for their Treatment during the Voyage to Europe. By Mr.* John Lindley, *F. L. S. &c. Assistant Secretary for the Garden.*

Read November 5, 1822.

The importation of plants from foreign countries has now become an object of such great importance, not only to the Society itself, but to a large portion of its Members, that *directions for preparing collections for their voyage hither,* are become absolutely indispensible. For it is an undoubted fact, that a very considerable part of the losses continually sustained by collectors, especially among plants sent from China and the East Indies, are in a great measure to be attributed to the insufficient manner in which the packages were originally made up. This having been particularly the case with many fine collections sent to the Society in the course of the present year, my attention has necessarily been directed strongly to the subject; and as it is probable that instructions published through the medium of the Society will be more likely to remedy the evil than any given in a separate form, I now beg to submit the following suggestions to consideration.

The insecure modes of packing plants abroad do not, of course, arise from any indisposition on the part of those who

prepare them to give them all necessary care, nor from any indifference as to their fate; but entirely from not considering sufficiently the various accidents to which plants on shipboard are exposed, and the improbability that they will experience, even under the most favourable circumstances, that care and attention which they require. In vain are lives and property risked in attempting to transfer the vegetable beauties of other countries to this, if the same pains which were devoted to procuring them be not continued in their subsequent management. The idea which seems to exist, that to tear a plant from its native soil, to plant it in fresh earth, to fasten it in a wooden case, and to put it on board a vessel under the care of some officer, is sufficient, is of all others the most erroneous, and has led to the most ruinous consequences.

Perhaps, beyond any thing else, it is necessary to take care that before plants are finally prepared for their voyage their roots be well established in the pots in which it is intended they should be transported. With many herbaceous plants this requires only a short space of time; but for such as are shrubby, or of a hard woody texture, a period, in many instances, of not less than two or three months is absolutely necessary. The attention of gentlemen residing in hot countries, particularly within the tropics, cannot be directed too strongly to this fact, which if alone neglected, must either destroy entirely, or very materially weaken, the effect of any attention which may be otherwise bestowed.

I would recommend that square wooden boxes be used for the plants instead of earthenware pots, not only because the former are less liable to be broken, but also because they are

lighter. When the period for embarking them arrives, they should be placed in wooden cases, the tops of which must be capable of being opened, and should slope both ways like the roof of a double green-house. These cases must be furnished with a tarpawling, fixed along their tops, and sufficiently large, when unrolled, to cover them completely, so as to protect the plants from being damaged by the salt water dashing over them in rough weather.

It cannot be expected that heavy cases should meet with very gentle treatment on ship-board, and it is certain they will be handled in the roughest manner by watermen, carters, and custom-house officers, after they have arrived in port. The materials, therefore, of which they are made, ought be of a very strong description, and the joints of the lower part either secured by iron bands, or well dove-tailed together; but as the former method is attended with less trouble, and is equally secure, it will probably be the more generally adopted. Instances are not uncommon of fine collections being delivered from the custom-house with the sides of the cases beaten in, and the plants and pots broken in pieces.

The person in charge of the cases on board should have directions never to exclude them from air and light in fine weather, unless to protect them from the cold, as the vessel makes the land, and after she is in port, or during high winds, or especially when the seamen are washing the decks; but in foul weather to close the lids down and to unroll the tarpawling over the latter, so as to exclude the sea spray effectually. If, notwithstanding these precautions, saline particles should become encrusted upon the leaves and stems

of the plants, it is necessary that the former should be removed as soon and as carefully as possible, with fresh water, and a sponge; otherwise the salt soon kills them. The quantity of water the plants receive must be determined by what can be spared; so that no other direction for its application can be given, than to keep the mould just moist. The requisite supply of water must also depend much upon the way in which the cases are drained. The best manner in which this can be effected, is by causing holes about half an inch in diameter to be bored through the bottom of the cases and pots. Much mischief being occasionally done to collections by monkeys and parroquets on board the vessels, it is highly necessary that means should be taken to guard against their attacks.

Collections are not unfrequently injured after they arrive in this country, by the pots being shaken so violently as to be deprived of a large portion of their mould. Nothing can well be more destructive of vegetable life than this, which should be prevented by the pots being made square so as to fit accurately into the bottom of the outer case. There then could be no difficulty in keeping them steady; and if they were fastened down by cross pieces of wood, they would be secured still more completely. In addition, the surface of the mould ought to be covered deeply with coarse moss, or other similar substance (not grass,) which might be secured by packthread passed frequently across the box from its sides, or by slender laths, which would be less likely to become rotten than packthread. By this means evaporation of the watery particles which are necessary to the existence of the plants, proceeds much less rapidly than when the mould is exposed;

and the latter has an additional security against being shaken out of the pots.

When it happens that pots are not to be procured, the want of them must be supplied by the collection being planted in earth in the cases themselves, their bottom being previously strewed to the depth of an inch or two with fragments of earthenware or bits of wood. In such cases it is particularly necessary that the mould should be securely fastened down.

Parasitical Orchideæ, or, as they are commonly called, *Air Plants*, may be transported safely to any distance by being packed loosely in moss, and put into boxes so constructed that the plants may be exposed to a free admission of air, but protected from the sea water. So managed, with a moderate supply of water, the most delicate of them might, probably, be transported to any distance without difficulty. But if, as is generally the case, they are packed closely in moss, in boxes insufficiently ventilated, they will inevitably become heated and perish. It has occurred to me that the best method of sending them would be in boxes made of trellis work, and provided with cross pieces of wood in their inside, to which the plants with the bark or moss on which they grew might be securely tied, and the interstices filled loosely with moss. The lid of such cases might be nailed down, and no other subsequent care would be necessary than a gentle occasional watering and protection from sea spray. Or they might, perhaps, be transported safely by the still more simple plan of placing them in closed boxes, they being first carefully separated with the rough branches of the trees on which they grew. For the chief point is

to keep them from heating; and that could scarcely occur if the branches or intervening substance were so disposed as to prevent their leaves touching each other.

Bulbs travel most securely if they are packed in paper or canvas bags, they having been previously dried till all the moisture in their outer coats is evaporated. Dry sand is a good medium for placing them in, if opportunities should not have occurred of giving them the necessary exposure to the sun. But minute bulbs, such as those of *Ixias, Gladioluses, Oxalises,* and others of a similar kind, only require to be folded in separate little parcels without any previous preparation. *Terrestrial Orchideæ* should be transplanted when in flower, and not when their roots are in a state of rest.

Among the mould in which plants are potted, it is very desirable that any woody or bony seeds, or capsules, that may have been procured should be buried; or any of those seeds, the juices of which become rancid soon after gathering, such as those of *Guttiferæ, Magnoliaceæ, Sterculiaceæ,* &c. *Camellia* seeds, which are not readily transported, if sown in mould in China, will have become seedling plants before they reach this country. *Acorns* and *Walnuts* may be conveyed from *hot* countries much better in this way than in any other: packed thus, we may some day expect to receive from China plants of *Quercus cornea* of LOUREIRO; which I may observe is a species of *Hickory.* The plants of the rare and curious *Butter and Tallow tree* of Sierra Leone, which have been raised in the Society's Garden from seeds collected by Mr. GEORGE DON, in the present year, are nearly all of them the

produce of capsules sent home in moss or in mould. Of the many packets received in a dry state, in paper, scarcely any could be made to vegetate. *Palms* too are better sent in this way than in bags or paper.

The plants in all cases, if possible, should have numbers punched upon small pieces of thin sheet lead, and fastened round the subjects to which they belong with fine iron or copper wire. When such lead is not to be procured, little wooden tallies should be used instead; always, however, tied round the stem or a branch of the plant, and never stuck into the mould in which it is planted. Paper or parchment tickets ought on no account to be used. Corresponding with these numbers, lists should be prepared in which the names, localities, principal features of the plants, and particularly the elevation above the sea at which they were collected, should be fully stated; their vernacular names ought moreover to be ascertained, when they have any.

Among the cases received by the Society this year from its numerous contributors, were four transmitted by his Excellency Sir Robert Farquhar, from the Mauritius. They were a kind of portable green-house, constructed in a very superior manner to any I have seen elsewhere. It is therefore presumed that an accurate plan and description of them, with such slight alterations as have appeared to be requisite, cannot be otherwise than acceptable. The plants they contained arrived in this country in much better condition than any received by the Society in the same year.

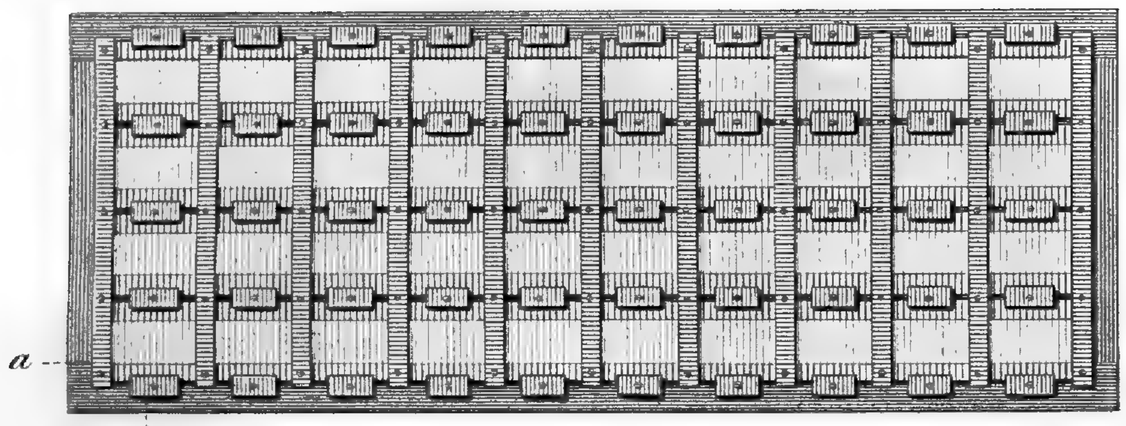


Fig. 3.

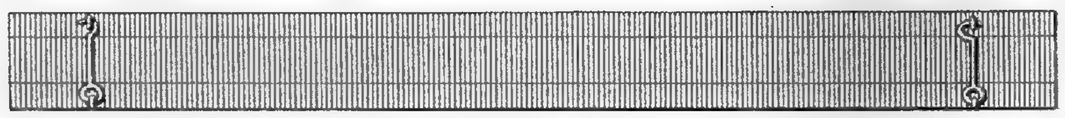
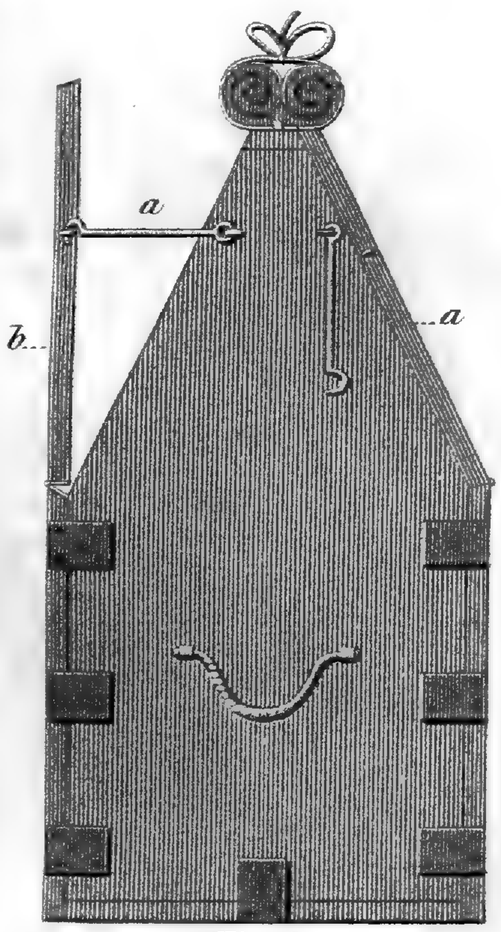


Fig. 4.



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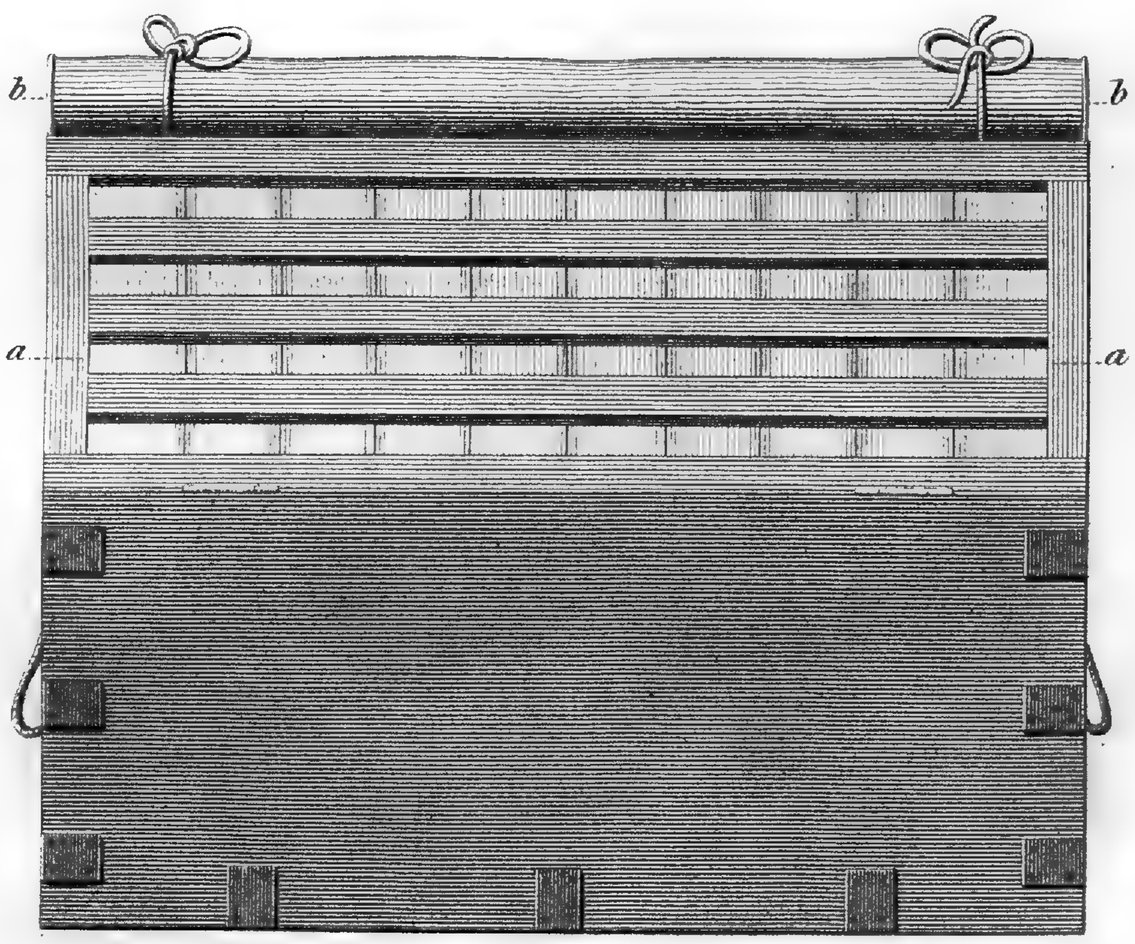


Fig. 1.

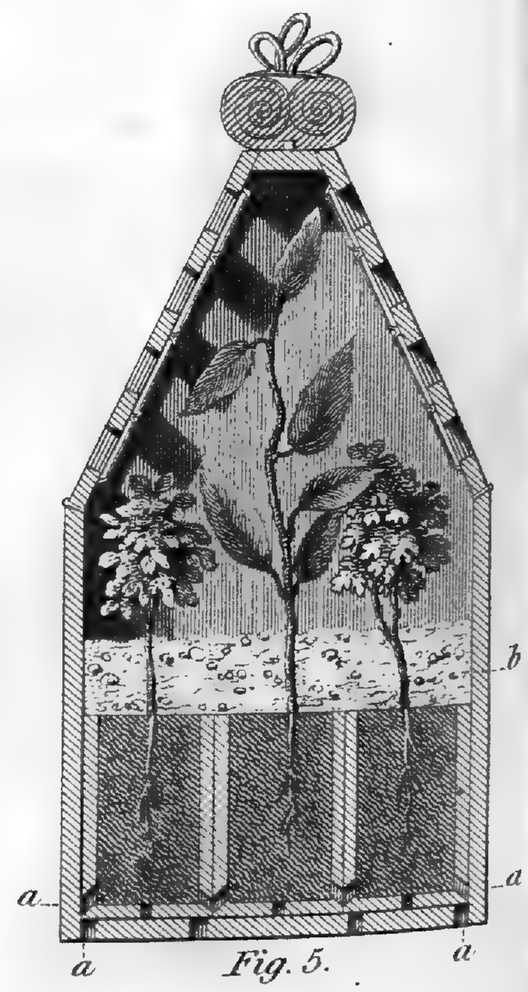


Fig. 5.

4 feet.

Box for protecting Plants during Sea Voyages.

Landsey del.t

J.B. Taylor

Description of the Boxes.

They were made of stout inch board well fastened together. Their height was three feet, length four feet, breadth one foot eight inches (Fig. 1). Twenty inches from the bottom they sloped off like a penthouse till the top was not more than two inches and a half wide. The sloping part on each side was closed by a shutter (Fig. 1. a. a.) formed of wooden bars two inches wide and two inches asunder, connected by a cross-rail at their ends. To the inside of these, panes of stout coarse glass were fixed by means of narrow slips of tin fastened to the centre of the bars where necessary, and well puttied in. (Fig. 3. a. a.) The shutters were moveable by means of hinges on their lower side, and in fine weather were kept open by hooks (Fig. 2. a. a.) fixed within three or four inches of the top into each side of the end of the boxes, and fitting into a staple in the corresponding edge of the shutter; they were long enough to sustain the shutter, when open, in a perpendicular position (Fig. 2. b.) The shutters fell down so as to close the boxes completely in rough weather, and were kept together by two hooks fixed in the upper edge of one shutter, and catching into a corresponding staple in the opposite shutter. (Fig. 4.) A piece of tarpawling (Fig. 1. b. b.) was nailed to the top of the boxes, and in rough weather was unrolled and fell down over the sides, so as to protect them from the sea spray. In fine weather, when the shutter was opened, it was rolled up again, and tied together with two pieces of cord so as not to interfere with the shutters opening and closing. The trees were planted in square wooden boxes, just large enough to contain a single plant, and perforated with holes in their sides and bottom. (Fig. 5. a. a.)

Explanation of the Plate.

Fig. 1. Side view of the case, with the shutter *(a a)* closed, and the tarpawling *(b b)* rolled up, and fastened with cords.

Fig. 2. End view of the case, with one of the shutters *(b)* opened.

Fig. 3. Inside of a shutter, shewing how the tins *(a a)* for fixing the glass are placed.

Fig. 4. The top, shewing in what way the shutters when closed are fastened.

Fig. 5. Section of a case. *a. a.* holes for draining. *b.* the moss above the pots.

XIX. *On* Grafting Vines. *In a Letter to the Secretary.* *By* John Braddick, *Esq. F. H. S.*

Read February 6, 1822.

Dear Sir,

In compliance with your request, I now proceed to give you an account of the experiments made by me in *grafting Vines.*

I have for some years past amused myself in raising Vines from seed; but many of these have produced fruit so much resembling each other, that it became necessary, in order to keep up a variety, to change the sorts; and as the requisite time to raise new seedlings to a bearing state is four or five years, I conceived it to be highly desirable to find out some sure method of making the Vine take by grafting.

The information which I collected from books on this subject was, that Vines may be easily made to grow by grafting, and that the proper time for performing the operation was in January and February, for Vines growing under glass; and in March for Vines growing in the open border. But, out of forty or fifty Vines which I operated upon, in the above months, I had the mortification to find that very few of the grafts grew, and those which did take became weakly plants, and were as long a time in coming into bearing as would have been lost had I removed the old and brought forward other new seedlings to supply their places.

I observed that the stocks of the Vines grafted as above mentioned all bled profusely, and upon unbinding those grafts

which did not take, I found that the parts of the grafts which joined to the stocks were sodden, and turned black, by their being steeped for a considerable time in the thin sap of the stock, before it became glutinous enough to cause their adhesion.

To stop the bleeding I tried every experiment with styptics, cements, &c. that I ever read or heard of, with many others suggested by my own imagination: but all without effect. One experiment I will mention, as it may serve to show the great power of the rising sap in the Vine, while its buds are breaking. On the 20th of March, in the middle of a warm day, I selected a strong seedling Vine five years old, which grew in a well prepared soil against a south-west wall; I took off its head horizontally with a clean cut, and immediately observed the sap rising rapidly through all the pores of the wood from the centre to the bark. I wiped away the exuded moisture, and covered the wound with a piece of bladder, which I securely fastened with cement and a strong binding of waxed twine. The bladder, although first drawn very close to the top of the shoot, soon began to stretch, and to rise like a ball over the wound; thus distended, and filled with the sap of the Vine, it felt as hard as a cricket ball; and seemed to all appearance as if it would burst. I caused cold water from a well to be thrown on the roots of the plant, but neither this, nor any other plan that I could devise, prevented the sap from flowing, which it continued to do with so much force as to burst the bladder, in about forty-eight hours after the operation was performed; the weather continuing the whole time warm and genial.

I now fitted a graft to this stock, and after binding it on, I

took a piece of bladder doubled, and made a small hole in it, so as just to let the tip of the graft and the eye pass through the hole; the inside of the bladder I covered with a cement made with bees-wax, resin and tallow, and bound the whole with strong waxed twine, from just under the eye of the graft to six inches below on the stock. The sap having now no other way to escape, was forced up through the pores of the graft: in a short time I was pleased with observing the bud of the graft swell, and when the other Vines on the same wall began to grow it broke, and made a shoot with several joints. It however soon became evident that no union had taken place between the graft and the stock, as the shoot of the former turned sickly, and before midsummer died entirely away.

The next season I took a healthy growing Vine in a pot, and carefully matched it with a seedling Vine of the same size, growing in the open ground; these I inarched together, and bound a bladder round the wound, instead of using cement. Upon cautiously removing the bladder at different times, I found that both the Vines bled profusely, and no adhesion began to take place until they had both shot out four or five joints from each of their eyes; the bleeding then ceased, as I judged, by the sap becoming more glutinous.

It consequently now occurred to me that the proper time for cutting off the heads and grafting of Vines, without incurring the danger of their suffering through bleeding, was when they had reached that period of their annual growth, at which the sap ceases to flow thinly and rapidly. I accordingly cut the branches of several in that state, and grafted them with cuttings of the preceding year; all these grew, the

operation being performed by whip grafting, and no other covering was used than a binding of bass surrounded with grafting clay.

From these and various other experiments which I have since made, I feel confident in stating, that healthy Vines may be successfully grafted, with young wood of the preceding year's growth, from the time that the shoots of the stocks which the grafts are to be put upon, have made four or five eyes, until midsummer; with every prospect of the grafts growing, and without the least danger of the stocks suffering by bleeding.

They may likewise be grafted with shoots of the same summer's growth, worked into the rind of the young wood, from the time that the young bunches of grapes become visible on the stocks till July, out of doors; or till a month later, under glass. The operation must not be performed later than the periods here specified, because time is necessary for the young shoots of the grafts to become hard and ripen before winter.

Some cuttings of Vines sent from Madeira, which I received from the Horticultural Society, were grafted on the 10th of last May by me, on seedling Vines which were growing under glass, but without fire heat, with the following results.

1. The *Verdelho* graft shot fourteen feet, produced one small bunch of grapes, and ripened its wood well.

2. The *Negro Molle,* grafted on the same stock, shot upwards of twelve feet, produced no fruit, but ripened its wood.

Another graft, of which the name was accidentally lost, was not put on till the 1st of July; it was then worked on to the

top of a young shoot of the same summer's growth: this has also grown, and ripened three eyes of its wood.

I am, dear Sir,

very respectfully,

your most obedient servant,

John Braddick.

Thames Ditton,
January 14, 1822.

XX. *Some Particulars, relative to the* Providence Pine Apples *grown at Ragley, in the year* 1822. *By* Joseph Sabine, *Esq. F. R. S. &c. Secretary.*

Read October 15, 1822.

At the Anniversary dinner of the Society, on the 4th of June last, four *New Providence Pines* were received from Mr. Thomas Baldwin, Gardener to the Marquess of Hertford, at Ragley. The four together, weighed thirty-two pounds ten ounces and a half; the largest, eight pounds fourteen ounces and a half; the next, eight pounds five ounces; the third, eight pounds two ounces; and the fourth, seven pounds five ounces.

These fruits were so remarkable for their size and beauty, that I was desirous of obtaining some information relative to Mr. Baldwin's mode of treating them, and through the kindness of Mr. Hunt of Stratford-on-Avon, I received the following particulars on the 24th of July last.

"Having occasion to be a good deal at Ragley, I could not but observe the very superior manner in which the Pines there were managed by Mr. Baldwin; but one particular stove attracted my attention more than the others, and which contained forty New Providence Pine plants, some of which were three years and others two years old, about equal numbers of each. Mr. Baldwin has cut thirty-six fruit, which weighed together two hundred and eighty pounds four ounces; one weighed eleven pounds eight ounces; another,

eleven pounds four ounces, and several of them ten pounds and upwards; there are two more yet to cut, which I think will be from eight to ten pounds each, the remaining two plants will not fruit till next year.

"I understand from Mr. BALDWIN, that he has treated them exactly in the same way as he does his Queen Pines, the particulars of which are given in his *Practical Directions for the Culture of the Ananas.*"

Postscript.

February 1, 1823. I have lately learned from Mr. HUNT, that the two Pines mentioned above, which were uncut in July last, when ripe, weighed nineteen pounds and a half, one ten pounds, and the other nine pounds and a half. The two remaining plants of the pit are now fruiting, and promise to be very fine; they will probably ripen in May.

XXI. *On* Fertilizing the Blossoms of Pear Trees. *In a Letter to the Secretary. By the Rev.* George Swayne, *Corresponding Member of the Society.*

Read August 6, 1822.

Dear Sir,

An almost general unproductiveness as to the fruit of the superior varieties of Pear trees, has long been the subject of complaint with horticulturists, both of South and of North Britain. Among the first prizes offered by the Caledonian Horticultural Society, was one, " for the communication of the best means of bringing into a bearing state full grown fruit trees, especially some of the finest sorts of French Pears, which (it is stated), though apparently in a very healthy and luxuriant condition, are yet in a state of almost total barrenness ;" and the President of the London Horticultural Society, in his Paper on the Cultivation of the Pear-tree,* remarks that " the Pear-tree exercises the patience of the planter during a longer period, before it produces fruit, than any other grafted tree which finds a place in our gardens ; and though it is subsequently very long lived, it, generally, when trained to a wall, becomes, in a very few years, unproductive of fruit." But I have no need, at least for my own conviction, to refer to the testimony of others for proof of the existing grievance, possessed as I am myself of a striking instance of this untoward disposition in an individual of the genus Pyrus, which has for a long time baffled all my attempts to alter its

* Horticultural Transactions, Vol. II. page 78.

infertile habits; it is that of a Gansell's Bergamot, which has grown for twenty years or more in its present situation against a wall, part of which has a south-west, and part a south-east aspect.

This tree has all the appearance of health, and sufficient luxuriance, and has been for several years constantly covered with a profusion of blossoms at the proper season, but has never before this, borne more than three or four Pears in any one year; and most frequently not a single one. It never occurred to my observation, before the year 1820, when I was much occupied in the artificial impregnation of different kinds of fruit, that, out of from nine or fewer, to fifteen or more florets, of which the cluster (botanically corymbus), of the Pear-tree consists, only the three lower ones, (generally speaking), *set*, or, in other words, are effectually impregnated, for fruiting. Recollecting the practice of the best gardeners, of topping their early beans, i. e. of pinching off with the fore finger and thumb the uppermost blossoms, some apparent, and others in embryo, of the general spike, for the purpose of setting the lower and earliest ones, which would otherwise, in most cases, prove abortive, I conceived, that removing the upper and central blossoms of the corymbus of the Pear, as soon as it could conveniently be done, would have a similar good effect in invigorating the remaining ones, and causing them to set with greater certainty. With this view, in the spring of 1821, as soon as the three lower blossoms of the corymbi began to shew their *white* faces, I set to work with my sharp-pointed scissors on two Pear-trees, the one, the Gansell's Bergamot above mentioned, and the other a Brown Beurré, and in as short time as I could have properly thinned two dozen bun-

ches of Grapes, I divested both these trees of at least three-fourths of all their budding honours. On the Beurré, this operation, subsequently, appeared to have the best effect. For there was scarcely an instance in which the three remaining blossoms did not *set*, which afterwards produced the finest crop of Pears I have yet gathered from that tree. But on the intractable Gansell, although the blossoms at first seemed to set, and many of them did not fall off till Midsummer, when they were nearly as large as common gooseberries, yet not a single Pear arrived at maturity. By dissecting many of the largest of those which fell off last, and comparing them with some of the Beurrés of the same age and size, it was plain that the kernels of the former had not been impregnated. This circumstance induced me to think that there must be some imperfections in the essential parts of the blossoms.

In the following spring of 1822, on attending to the blossoms of this tree, which blooms earlier than any other Pear-tree which I have, they appeared to me, to remain much longer in a globular state without expanding, than any other variety of Pear which I have had an opportunity of noticing. I fancied likewise that the pointal was fit for impregnation before the anthers were ripe, and even before the petals expanded; and from the peculiarly slender and delicate make of the latter, as it struck me, I supposed, that it ceased to be in a proper state as soon as it became exposed to the sun and air; I therefore concluded, that there might possibly be a chance of obtaining fruit, by depriving the blossoms of their petals before they expanded, and inclosing with each floret in this state, within a paper envelope (as is my mode of effecting artificial impregnation) a riper *blossom*, viz., one that had just

begun to diffuse its farina, either one of its own, or, preferably, of some other variety of Pear. Accordingly, on the 27th of March, 1822, I began this operation, and in a day or two had tied up in the manner just mentioned, twenty-seven blossoms. Ten of these envelopes contained blossoms of the Beurré Pear, which (it not blooming so early as the Gansell), were the only ones I could then find in a state of expansion. Fourteen (to make up, with the former number, two dozen), contained blossoms from the same tree, and three blossoms of the Pound Pear. From the latter presenting a large and coarse appearance, I had very little expectation. I intended to have done many more, but the weather getting colder, and being myself not quite in health, I neglected it till it was too late. The papers were not taken off till the 15th of April, on which day the weather began to be warmer, without sunshine. You will please to observe, that I had previously cut off from all the corymbi with which the tree was abundantly furnished in every part, all the blossoms except the three lower ones, as in the former year; and that having tied up but one of these in each corymbus, I immediately cut off the *two* remaining ones. The blossoms were operated on in different parts and aspects of the tree, for part of it, as I said before, faced the south-east and part the south-west. Of the *ten* blossoms, treated with the Beurré Pear, *eight* set, two of which afterwards fell off, but I suspect not fairly, and six are now proceeding to maturity. *One* only of the *fourteen*, where its own blossoms were used, now remains. Of the *three* wherein the Pound Pear was concerned, the whole failed. The only Pear now on the tree which set naturally, and on which no operation was performed, was produced on a cluster of blossoms, at the

extremity of a leading horizontal shoot of last year, which did not make its appearance till after the others had dropped off. This circumstance, by the way, proves that the fruiting buds of the Pear do not invariably require *three* years* for their perfection, since the bud, naturally the most productive on the tree in question, could not have been visible at farthest before the middle of last summer. As the Pears are now from five and a half to seven and a half inches in circumference, I consider them as past all danger of failure, or rather, that they will only fail through the application of violence. Three are in a line within the space of twelve inches near the centre of the tree, and one is on a branch which I considered, at the time of the operation, to be the most unlikely to succeed, as being in the most exposed situation.

Whether the result of the above detailed experiments be such as to authorize an expectation that artificial assistance in vegetable fecundation will hereafter become of so much importance to gardeners in the instances just alluded to as in those at present recognized, of the Cucumber, the Melon, the early Bean, and the Hautbois Strawberry, must be left to futurity to ascertain.

I am, dear Sir,

Your obliged humble Servant,

GEORGE SWAYNE.

Dyrham,
August 2, 1822.

* See Horticultural Transactions, Vol. III. p. 151.

Note by the Secretary.

Mr. SWAYNE sent to the Meeting of the Society on the 1st of October, specimens of the Pears alluded to in the foregoing communication. They were unusually large, and very handsome. The cross impregnation had not produced any change in the appearance of the fruit, nor was any difference in flavour discovered.

XXII. *On the* Construction of Flues of Hot-houses. *In a Letter to the Secretary. By Sir* George Stewart Mackenzie, *Bart. F. H. S.*

Read September 18, 1821.

Sir,

The *Construction of Flues* has been a frequent subject of consideration with me, since I communicated* to the Horticultural Society what is now considered by many to be the best form for the roofs of hot-houses of all descriptions. This is a subject which admits, most readily, the application of scientific principles; yet we are slow in making improvements, even when the principles on which we must proceed are obvious. The causes of our being slow may perhaps be found in the necessity of attending to various circumstances of convenience, and to the materials to which we have easiest access, as well as in our attachment to habit. The objects to be kept in view, when we attempt to improve the construction of flues, are, the occupation of as little room as possible, consistent with the production of the amount of heat required; facility in cleaning them, in removing and setting them up, as well as in repairing them; economy in the materials; durability; and lastly, that the materials shall be such as to give out heat readily.

In many parts of the kingdom, it is difficult as well as expensive, to procure bricks and tiles for flues of the most ordi-

* See Horticultural Transactions, Vol. II. page 171.

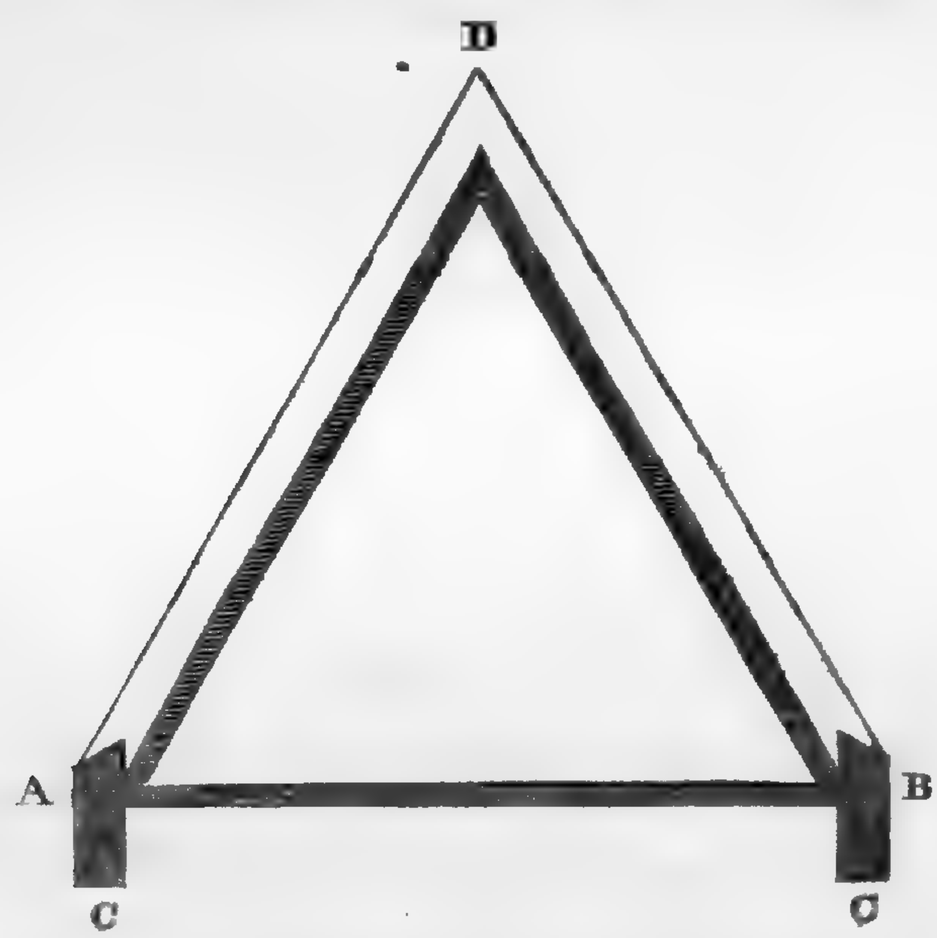
nary construction; and even in situations where they are easily got, gardeners almost universally complain of the trouble they occasion, and of their rapidly wasting. There can be no doubt that the best form for a flue is that of a cylinder, which is the form of what have been denominated, in the "Memoirs of the Caledonian Horticultural Society,"* *Can flues*; but it is obvious that while the cost of such flues is considerable, they are more liable to damage; and they are more expensive in repair than any other. It is a pity that these objections are so strong; because the peculiar advantage of cylindrical flues is, that, while there is radiation from the whole surface, the air is rapidly heated by its being in contact all round.

The application of cast iron to the construction of flues has been often thought of, but, in my opinion, too hastily rejected. To have this material in the form of tubes, may be objected to on the score of expense, as well as unwieldiness; and it may be urged against its use, under any form, that it is apt to crack on the application of cold water, which cannot be avoided when water is given to the plants in a house. The advantages which cast iron offer, are, however, so great, that I have kept it long in my view; and at length I feel myself warranted in recommending for trial, a form of flue, constructed chiefly of iron, which seems to embrace every thing that is desirable.

The figure represents a section of the flue in its complete state: A. B. is the bottom, made of cast iron, three-eighths of an inch thick, having two ledges to support the other pieces of cast iron of the same thickness, A. D. and B. D. When

* Vol. I. page 65, and page 353.

set up, A.B. is supported a few inches from the ground by short pillars at each corner of the pieces forming it; or it may be laid on stones or bricks; the casting the pieces with pillars C.C. adds but little to the expense. Each piece forming the flue should not exceed eighteen inches square; or if they are required to form a large flue, they should be made oblong, so as not to have a greater superficies than a square of eighteen inches; for the larger the pieces are made, the more liable they will be to injury from various causes. When it is desired to turn the flue into different directions, the corners are made of three pieces, and the form of them is obvious, without being expressed in a drawing.



The bottom may be left bare, as it is not exposed to injury, and that the air passing along it may be heated as much as possible. But the upper part, while it must be covered in order to make it air-tight, and to protect the iron, must have some substance applied to it, from which heat may quickly radiate. From a mixture consisting of one part of clay and three parts of sand, we obtain this object. After the iron is

set up, let such a mixture be made into a mortar with water, and two coatings laid on, each half an inch thick. Let the first one become dry without fire, and if any cracks appear, fill them up with the same composition. When the repairs are dry, (and many will not be required if the above proportions be used, and with materials well mixed) then put on a gentle fire for a few hours, and when the flue is again cold, fill up any cracks that may appear, and lay on the other coating of half an inch thick ; allow it to dry gradually, and fill up cracks, as before. After this second coating is dry, the fire for heating the house may be lighted. No pains should be taken to make the surface smooth, for the rougher it is, the more heat will radiate from it, and it will be better if the surface is rendered black, or of a dark colour. The unshaded part of the figure shews the clay and sand laid on.

At first sight it is obvious that this form of flues occupies as little space as possible; and when it is desired to clean it, any portion of it is easily removed, and as easily replaced. Cast iron is a very cheap and durable material, and readily procured; and there are few places where clay and sand, sufficiently good for the purpose of covering it, cannot be obtained.

It may be considered whether it would not be of advantage to have steam-pipes made of thin cast-iron, coated with sand and clay.

I am, Sir,

your faithful and obedient Servant,

George Stewart Mackenzie.

Edinburgh,
6th September, 1821.

XXIII. *On a Method of* Forcing Peaches and Nectarines, principally by *Dung Heat, as practised in the Garden of Sir* Thomas Neave, *Bart. F. H. S. In a Letter to the Secretary. By Mr.* John Breese, *Corresponding Member of the Society.*

Read November 5, 1822.

Sir,

I herewith do myself the honour to describe a method of *forcing Peaches and Nectarines principally by dung heat,* my object being to obtain every advantage which that kind of heat is capable of affording. The house is seventy feet long by eleven feet wide, the front wall being five feet and a half deep from the bottom of the lights that form the roof (there being no upright lights in front) to the ground; about three feet and a half of the bottom of this wall is open brick work with a flue in the inside, the top of which is covered with plain tiles; the inside of the house is filled up with earth to within two feet of the bottom of the lights, and the trees planted as near as possible to the front wall, and trained under the lights on wires, in the same way as Vines; the back wall of a Pine-pit is built of the same height as the front of the Peach-house, and three feet distant from it; this of course forms a space three feet wide for the hot dung: as soon as I wish to begin forcing, this space is filled with hot dung; the roots being near the flue soon begin to feel the warmth, and I sometimes take off a few tiles from the top of the flue, so as to admit the steam from the hot dung into the

House; I find this of great advantage, and productive of no ill effects until the leaf bud begins to expand, and if the steam is not then perfectly sweet and moderate, the places left to admit it must be secured. You will of course observe, that while this hot dung lining is forcing the Peaches and Nectarines, it is assisting to work the Pines in the Pine pit at the same time, and without any additional expense, there being also a lining at the front of the Pine pit, as well as this one at the back; and when it has become cooled by frequent turnings, I either make cucumber beds of it, or take it inside the Peach-house or Vinery. For these five years past I have never failed in producing an abundant crop of Peaches and Nectarines by the above method.

I am, Sir,
your obedient humble Servant,
John Breese.

Dagnam Park,
October 28th, 1822.

XXIV. *Description of a* Pine Pit. *In a Letter to the Secretary. By Mr.* Thomas Scott, *Gardener to* William Leader, *Esq. F. H. S.*

Read July 2, 1822.

Sir,

I have sent you plans and elevations of the *Pine Pit* which has been built for Mr. Leader under my direction, and which has completely answered every expectation I had formed of it, both in bringing the fruit of the Pine Apple to perfection, and in saving fuel to a considerable extent.

While I lived at the Earl of Besborough's, at Roehampton, I fruited from a hundred to a hundred and twenty plants in houses which consumed about twelve chaldrons of coals; the Pit I have sent you the drawing of will fruit the same number of plants with, at most, from three to four chaldrons.

Behind the back wall of the Pit there is a cavity for the reception of hot dung, fresh from the stable, and there are holes in the wall, to admit the heat from the dung into the pit. When the weather is dry, and a moist heat is required, I turn the dung once a week, but if the weather be wet, I use the fire, and let the dung lie undisturbed, so that I have either a damp or dry heat, at pleasure. I consider that no expense is caused by the use of the dung in this way, because, after being turned two or three times, it answers the same purpose, as it would after having been thrown up in heaps to sweeten it for Cucumber or Melon beds. The

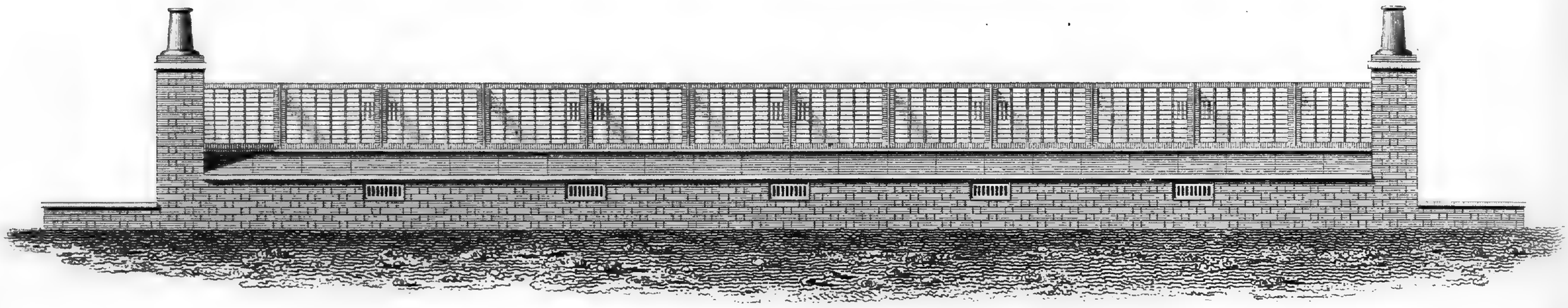


Fig. 1.

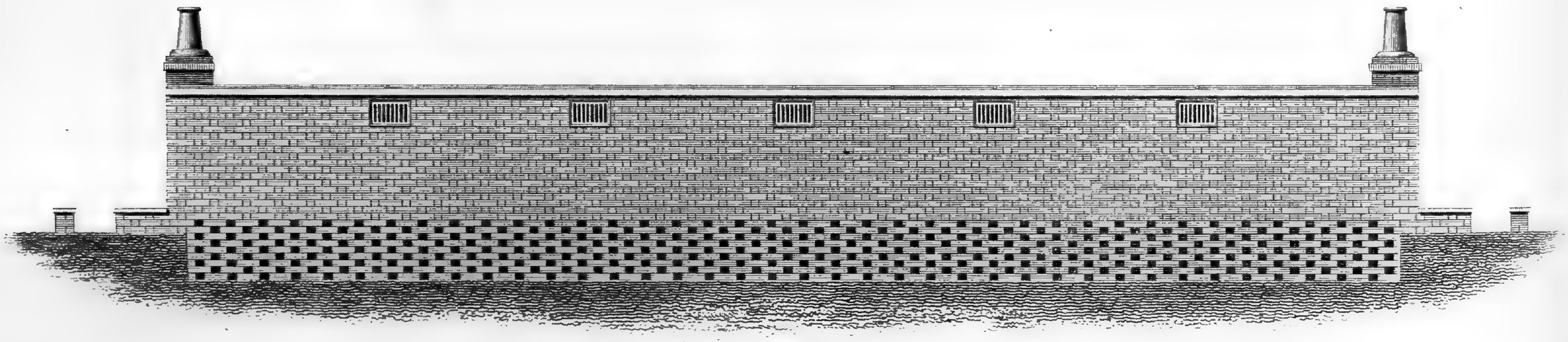


Fig. 2.

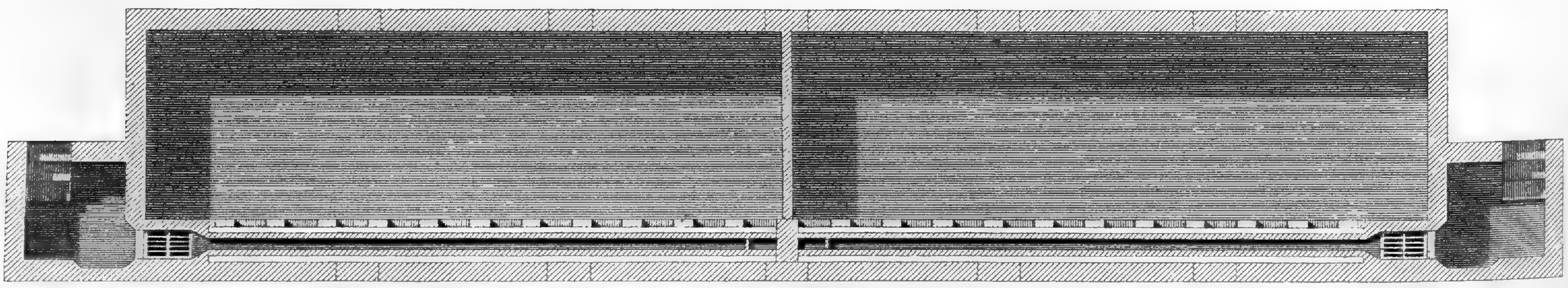


Fig. 3.

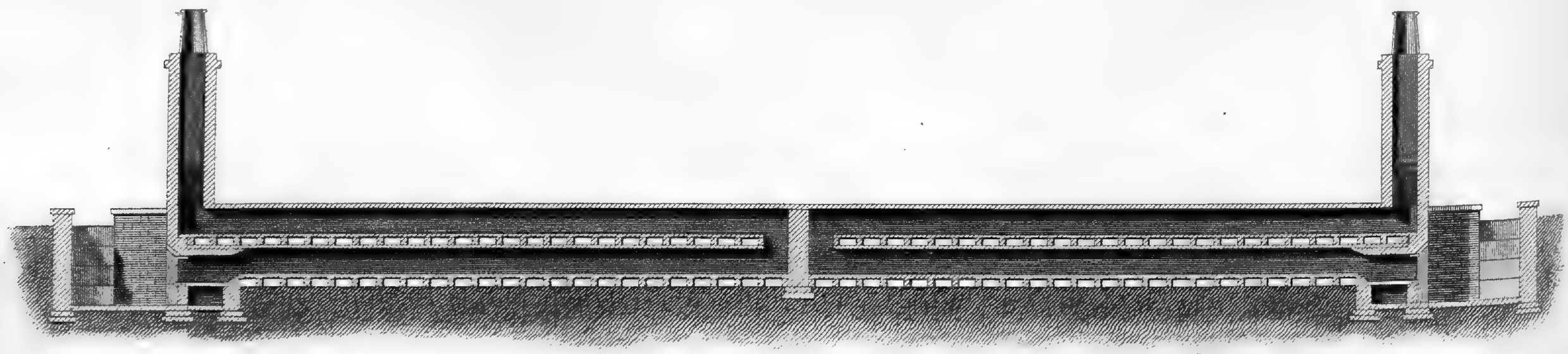


Fig. 4.

13 feet.

J.B. Taylor sculp.

Elevations, Plan and Section of Mr. Scott's Pine Pit.

Yorkshire-stone covering over the flue is a great saving; it is less costly than glass, and as the part that it covers requires no heating, by using it, instead of glass, the lights are reduced to a more convenient length. If there were no stone, the lights must be in two lengths, and the rafters would necessarily be considerably larger, so that there would be more shade on the centre of the bed, if the flue was within the glass. I always cover the lights with mats in cold weather.

The Pit is constructed in two divisions, in order to keep up a succession of fruit.

I am, Sir,

Your obedient humble servant,

THOMAS SCOTT.

Putney Hill,
July 1, 1822.

References to the Plates.

Plate V.

Fig. 1. Front elevation shewing the front and back ventilators, the latter seen through the lights.

2. Back elevation, shewing the back ventilators and the open brickwork.

3. Plan of walls, furnaces, flues, and stoke hole.

The piers shewn in this plan are to support the stone slabs which cover the flues, and the intermediate spaces are to admit the heat from the flue. The cross lines on the back wall mark the situation of the ventilators.

4. Section of furnaces, flues, and stoke hole.

Plate VI.

Fig. 1. End section, through the chimney.

a Back ventilator, when open.

b Dung pit.

c Drain.

d Apertures to admit the heat from the dung.

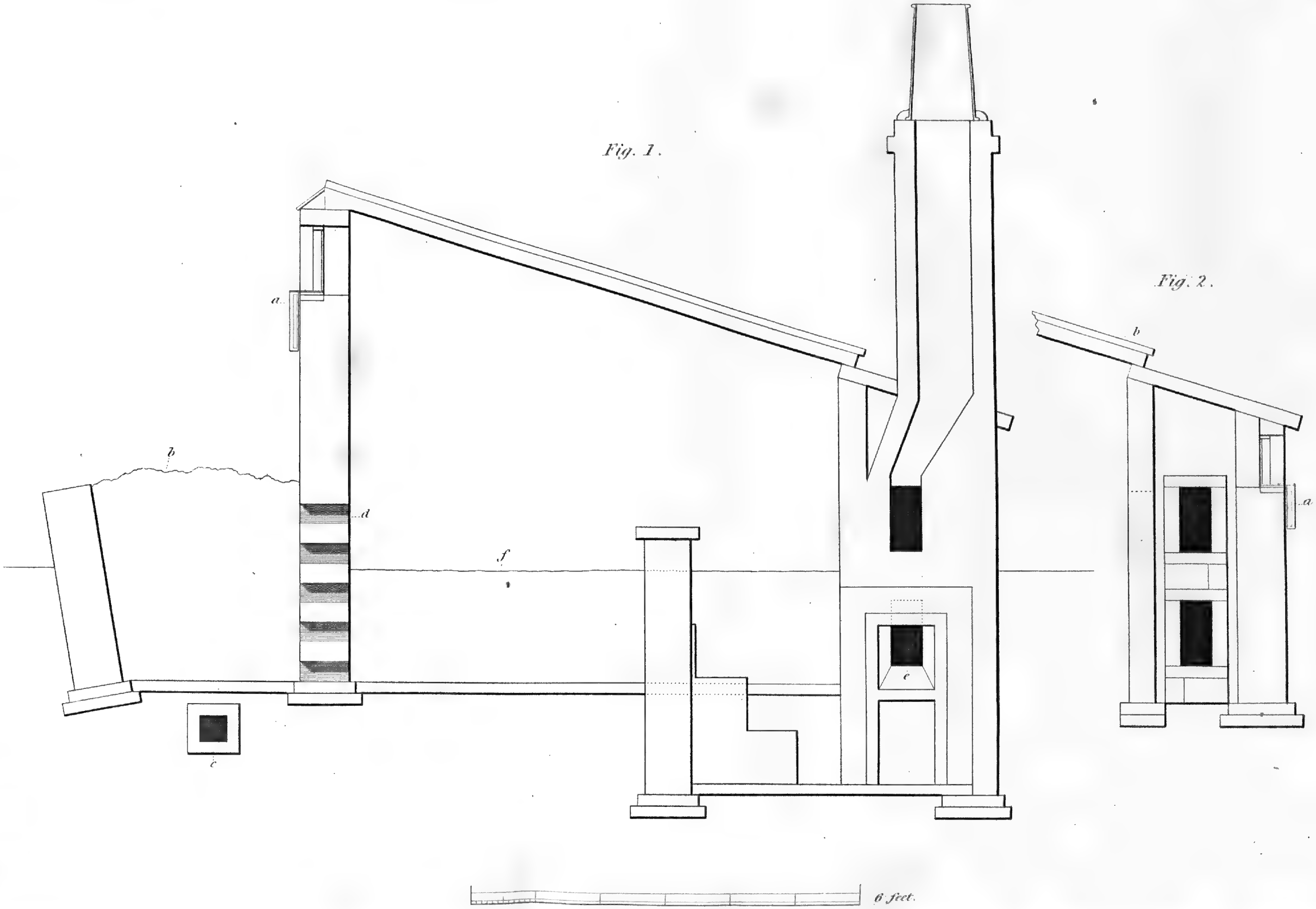
e Furnace.

f Level of the ground.

Fig. 2. End section of the flue.

a Front ventilator, when open.

b Foot of the rafter resting on the stone cover.



End Section of Mr Sells' Pine Pit.

XXV. *Description of a* Melon *and* Pine Pit. *By* Thomas Andrew Knight, *Esq. F. R. S. &c. President.*

Read July 16, 1822.

I sent an account to the Horticultural Society, in the last spring,* of a Pine Apple, which, having blossomed in the month of July, did not ripen till the following month of April, owing to its having passed the autumn and winter in low temperature; and I thence inferred that Pine Apples might easily be so managed as to supply the market abundantly in seasons when few species of fruit can be obtained. In the present spring I erected a small Pine Pit upon a new construction, for the purpose of ascertaining, by experiment upon a few plants, whether my opinions were well founded; but not having more plants than my houses could conveniently contain, I have applied the structure erected for Pine Apple plants to the culture of Melons only, during the summer.

These having succeeded most admirably, and a great number of gardeners having examined my machinery, and given their unqualified approbation of it, I send the following description of it to the Horticultural Society, flattering myself that it will be found, in the aggregate, superior to any now employed, which can be erected at so small an expense, and managed with so little cost and trouble. It consists of a

* See page 142 of this volume. The experiment has since been, in many instances, repeated, with similar results.

hollow wall, similar, in every respect, as to construction, to that described by Mr. SILVERLOCK in the *Transactions of the Society;** and I cannot describe it better than by using his words: "It is built nine inches thick, with sound even-sized bricks, placed edgeways, the joints being carefully made, and laid with the very best mortar. The bricks are placed with their faces and ends alternately to the outside, so that those which have their ends exposed become ties to the surfaces of the wall. In each succeeding course, as the wall is built, the bricks with their ends outwards are placed on the centre of the bricks which are laid lengthways in the course below. Thus a hollow space is formed in the middle of the wall, of four inches in width, which is only interrupted where the tying bricks cross it, but there is a free passage for air from top to bottom of the wall."

My front wall is four feet, and my back wall five feet six inches high, enclosing a space of six feet wide and fifteen feet long, and the walls are covered with a wall plate, and with sliding lights, as in ordinary hot-beds.

The space included may be filled to a proper depth with leaves, or tan, when it is wished to promote the rapid growth of plants; but at present it contains only nine large pots, in which the Melon plants grow, and the stems of these are supported by a trellis at a proper distance from the glass. The wall is externally surrounded by a hot-bed composed of leaves and horse dung, by which it is kept warm, and the warm air contained in its cavity is permitted to pass into the inclosed space through many small perforations in the bricks At each of the lower corners is a passage, which extends

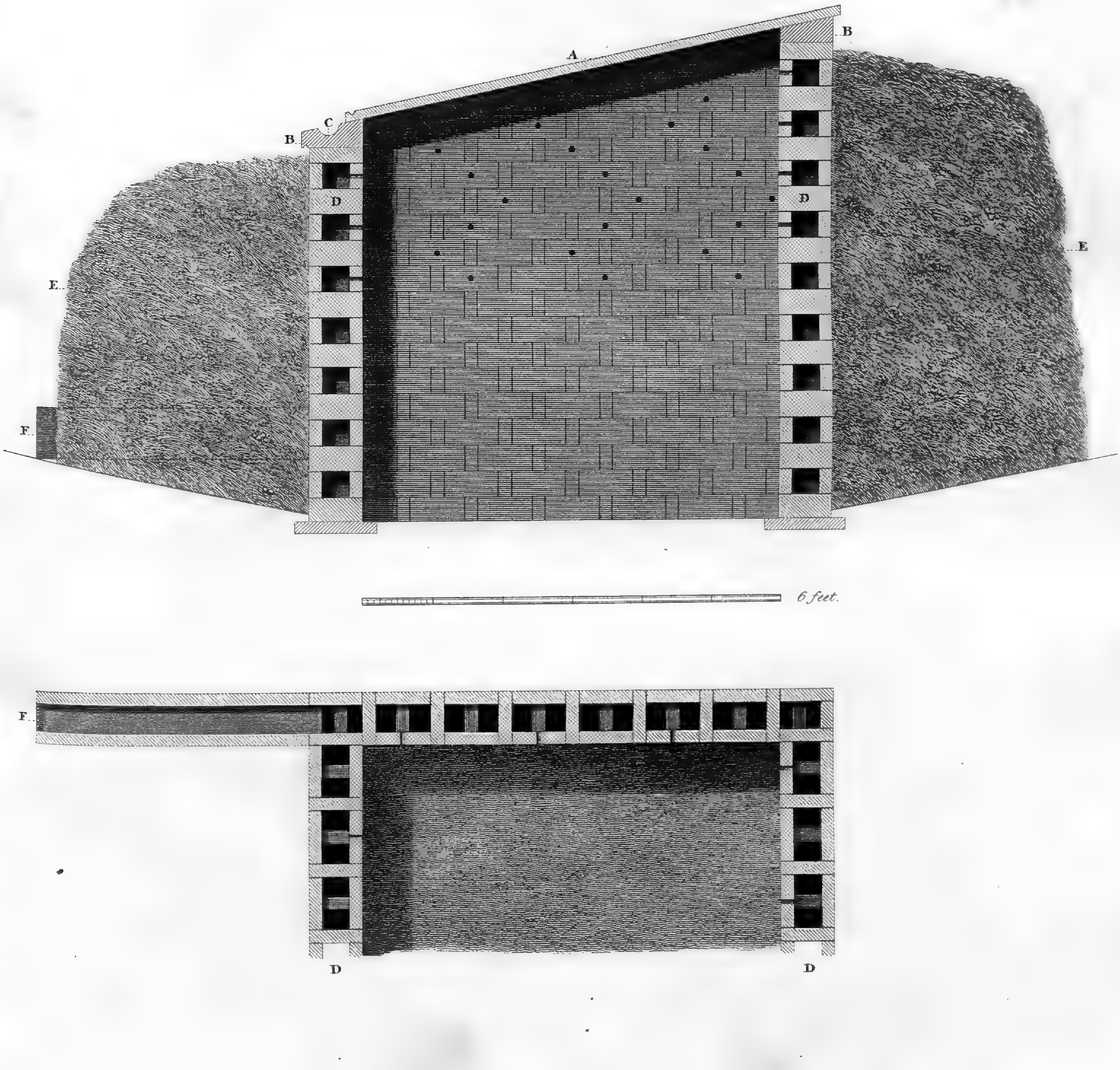
* See Vol. iv. page 224.

along the surface of the ground, under the fermenting material, and communicates with the cavity of the wall, into which it admits the external air to occupy the place of that which has become warm and passed into the pit. The entrances into these passages are furnished with grates, to prevent the ingress of vermin of every kind. The hot-bed is moved and renewed in small successive portions, so that the temperature may be permanently preserved, the ground being made to descend a little towards the wall on every side, that the bed in shrinking may rather fall towards than from the walls; and I entertain no doubt but that the perpetual ingress of warm air, even without an internal leaf bed, will prove sufficient to preserve Pine Apple plants without the protection of mats, except in very severe weather. I have nothing further to add, but that the Melon plants are the most healthy and luxuriant that I ever possessed, and that their fruit is swelling with more than ordinary rapidity. I annex a sketch of a section and plan of the Pit, without which, I fear, the preceding account would scarcely prove intelligible.

The perforations in the interior of the wall, are from eighteen to nearly twenty inches distant from each other, and they do not begin till the fifth row of bricks from the bottom. When the Pit is intended for early Cucumbers, or Melons, and the lower part is consequently to be filled with leaves or tan, the holes in the bricks should only be made above the surface of whatever may be put into the Pit, or, if previously made below, must be closed.

References to the Plate.

A. Sliding lights.
B B. Wall plates.
C. Water groove.
D. Hollow wall.
E. Dung linings.
F. Air funnels.



Section & Plan of Mr. Knight's Melon & Pine Pit.

J. B. Taylor sc.

XXVI. *Upon the Advantages and Disadvantages of* curvilinear Iron Roofs to Hot-houses. *In a Letter to the Secretary. By* Thomas Andrew Knight, *Esq. F. R. S. &c. President.*

Read October 1st, 1822.

My dear Sir,

You have more than once expressed a wish to receive from me an account of my opinion of the comparative advantages and disadvantages of the *iron curvilinear, and common hot-house roofs* of sliding lights, in the culture of the Pine Apple, as soon as experience should have enabled me to give it. I am now, I believe, in possession of sufficient information to enable me to give an opinion, with some degree of confidence, having had the experience of three summers, in which I have nearly sacrificed more than two hundred very fine fruiting Pine Apple plants in my curvilinear roofed hot-house. I have, however, ultimately succeeded to the full extent of my hopes and expectations, and I give a decided preference to the curvilinear roof. I must nevertheless admit, that it has some defects, which I shall endeavour to point out, and set in opposition to its perfections.

The curvilinear iron roof certainly transmits heat more rapidly than one of wood of the ordinary construction, but not to any considerable extent, I think, more rapidly than a roof composed of wood and glass would do, if the wood were employed in as small quantities as the iron is, and not nearly to as great an extent as a roof composed wholly of glass would do, if such could be constructed.

My house is fifty feet long, and ten feet wide, and it is heated by a single fire of moderate size; and I have found that single fire fully sufficient to keep Pine Apple plants in a healthy growing state, in all seasons of the year, without the aid of bark or hot-bed of any kind, and without the protection of any kind of covering.* I have always used it as a fruiting-house, and my plants, after being placed in it, have grown admirably, and have shown fruit well; but the fruit has never till the present year, except in one instance, when the plants stood close to the door, swelled properly. Its taste and flavour have nevertheless been good, and it constantly ripened in a singularly short time.

The fruit which appeared in September and October, in the last autumn, became ripe in January, and whenever one fruit became ripe, its aroma appeared to accelerate the maturity of all in its vicinity.

The Queen Pine Apples were generally very similar to those I have usually seen at the shops in London in the months of April and May; and with imperfections arising, I believe, from the same source, the want of efficient ventilation.

In houses of ordinary construction, with roofs of sliding lights, air enters and escapes at all times with much rapidity; and the consequent change of air is very nearly, if not wholly, sufficient to enable the Pine Apple to acquire maturity and

* A much higher temperature than my machinery enables me to give, and varying from 75° to 90° in winter, and from 80° to 105° in summer, would, however, be highly beneficial: and I feel quite confident that in a dry stove of such temperature, Pine Apples might, under appropriate management, be abundantly ripened, and in considerable perfection, in any part of the year.

perfection at all seasons; provided the flues operate with sufficient power to give the requisite temperature. But in my house, with a curvilinear roof, I acquired the power of almost wholly preventing any change of air whatever, and I exercised that power too extensively, after the fruit was shown, and particularly after a part of it had nearly acquired maturity. In the last spring I adopted a mode of ventilation, from which I expected to derive all the advantages of change of air, without materially lowering the temperature of the house, and the success of it has greatly exceeded the expectations I had entertained. I shall best be able to shew the advantages of this mode of ventilation, by giving a slight sketch of the form of a section of my house, in which D, marks the position of cylindrical passages of nearly two inches diameter through the front wall. Through these, which are placed eighteen inches distant from each other, along the whole front wall of the house, the air, whenever the weather is warm, is suffered to enter freely, and its entrance is at other times more or less obstructed in proportion to its coldness: but it is never wholly excluded, except during the nights in very severe weather.

The passages through the front wall are placed at just such a distance from the ground, as will occasion them to direct the air, which enters, either into contact with or to pass closely over, the heated covers of the flue. It consequently becomes heated, and is impelled amongst the Pine apple plants, which stand in rows behind each other, each row of plants being so far elevated above that before, as to place every plant at nearly an equal distance from the glass roof. A thermometer was placed at H, being equally distant from

each end of the house, and I had the satisfaction to observe, that the temperature of that part of the house, in which the thermometer stood, was raised between two and three degrees, when the external air was at 40°. This effect was, I conclude, produced by the heated air being impelled into the body of the house amongst the plants, instead of being permitted to rise, as it had previously done, and to come instantly into contact with the roof: and by suspending light bodies amongst the plants, I ascertained that the previously confined air was thus constantly kept in a state of rapid motion. The air is suffered to escape through passages of four inches wide and two inches and a half high, at E, which passages are placed at the same equal distances, as those in the front wall, and like those are opened or closed, as circumstances require. The trouble of opening or closing such passages, after substances of proper form are prepared and suspended, for the purpose, is very small, much less, I think, than that of moving the lights of any house of ordinary construction; and the effect of the kind of ventilation obtained upon the growth of my plants and fruit, is every thing I wish it to be.

I have stated that my whole house is heated by a single flue: this enters at the west end of it, and thence passes along the whole front within sixteen inches of the wall. It then returns twenty feet towards the middle of the house and back again, the smoke escaping at the end opposite to that at which it enters. The flue is consequently single at the end of the house, which adjoins the fire place, and triple in the last twenty feet of the opposite end; by which means a nearly equal temperature is every where given.

It has been objected, that the water which drops from bars of iron is extremely noxious to Pine Apple plants; but I have not found this to be in any degree the case: for having placed a plant in such a situation that the water from a cast iron rafter dropped upon it, in summer, and removing it only as soon as the mould became sufficiently moist, I could not discover that the plant had, during a month, sustained the slightest injury. Another objection made to iron roofs is, that the metal is very subject to rust. This is perfectly true, provided they be not kept well painted; but if one third of the sum requisite to keep a wooden roof properly painted be expended upon the iron roof, no injury will ever be sustained from the liability of that to suffer from rust. I must, however, take this opportunity of observing, that the bars of all the iron roofs I have yet seen have been exceedingly ill formed. The metal, instead of being rolled thin with grooves, and made to descend into the house far below the level of the glass, should be compressed into the least compass consistent with sufficient strength; and its lower surface, instead of being brought to a thin edge, should be hemicylindrical in form. None of the edges or angles, which are now presented, and which are most subject to rust, would then exist; less shade would be thrown upon the plants in the mornings and evenings; and the condensed steam would be less subject to drop from the bars upon the plants; though this, in a house constructed as mine is, can never do any injury.

I have remarked, in a former communication,* that I suspected Pine Apple plants might suffer under the influence of a bright sun during the whole length of an English summer's

* Horticultural Society's Transactions, Vol. iv. page 548.

day, in a hot-house with a curvilinear roof such as mine, if the glass were of good quality. I am not prepared positively to say, whether such apprehensions are well or ill founded: but I have thought it best to be provided with a net, such as those usually employed to protect fruit trees, of proper form to cover my house, if necessary, and I am satisfied that I could have used it with advantage, if I had possessed it, in some very hot days in the beginning of June.

The ends of my house are of brickwork; but I think the end opposite the door, ought to contain a window of about two feet square, to permit a free passage of air through, upon the door being opened in very hot weather: my own house is, however, without one.

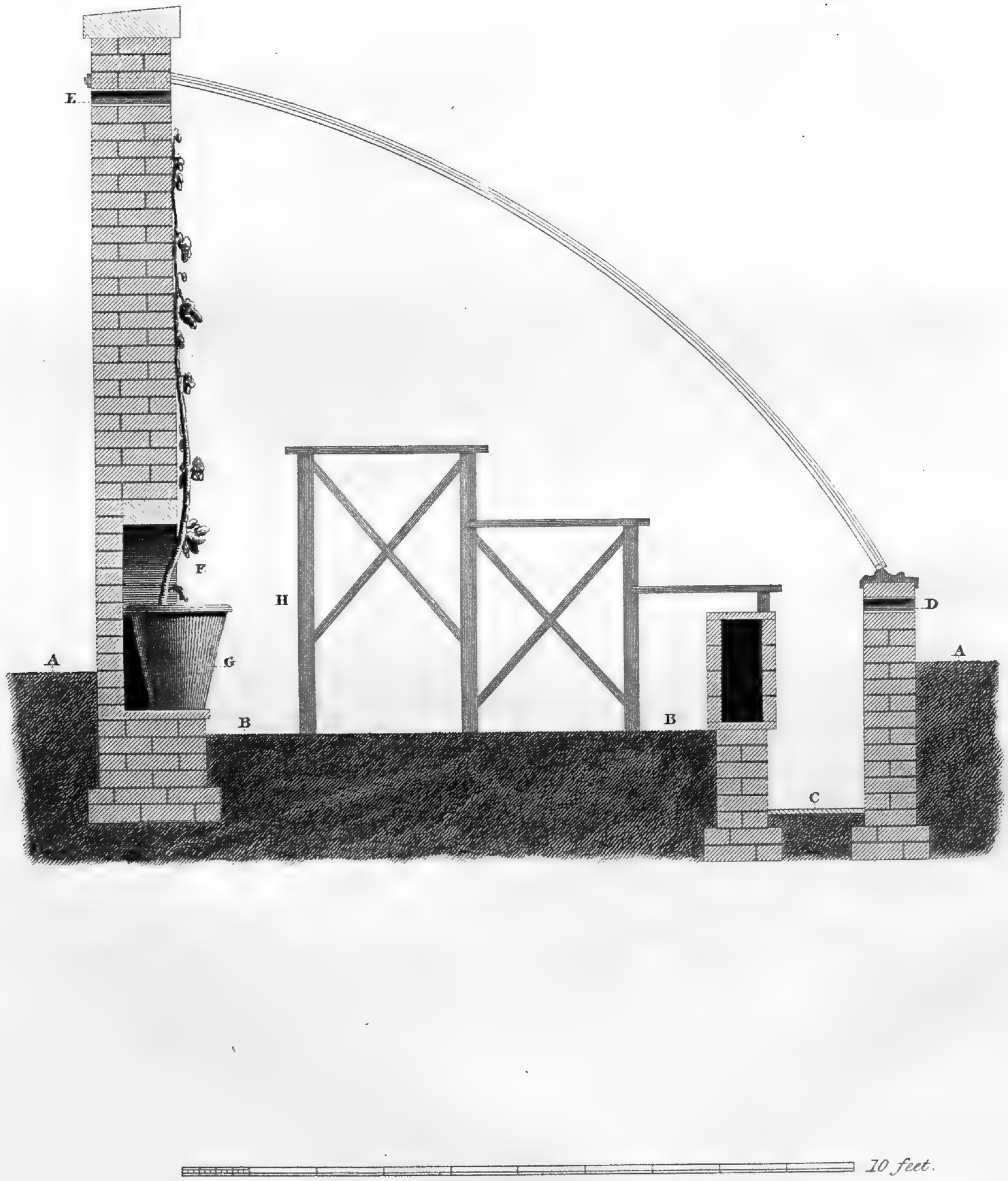
In conclusion I wish to observe, that a curvilinear iron roof, may be erected at much less expense than one of wood: two shillings and sixpence a foot being, I conceive, a fully remunerating price to the builder of such a house as mine, the glass being white, and of the quality called *best seconds.* Green glass might be afforded on much lower terms, but I do not recommend it, being confident that in our climate, Pine Apple plants suffer a hundred days by want of light, for one in which, with proper care, they sustain injury by excess of it.

I remain, my dear Sir,

yours very truly,

THOMAS ANDREW KNIGHT.

Downton,
September 18, 1822.



Section of Mr. Knight's curvilinear house.

References to the Plate.

A A. Level of the external soil.

B B. Level of the internal soil.

C. Level of the front walk, which is sixteen inches wide.

D. Passages to admit the external air eighteen inches distant from each other, along the whole front wall.

E. Passages to permit the escape of heated air.

F. Recesses six feet distant from each other, to receive in part, pots holding Vines and Fig-trees, or Tropical fruit trees.

G. A pot let half way into the recess.

H. The situation of the thermometer.

N. B. The advantages gained by the recesses are, that the stems of the plants intended to be trained against the wall are brought at once close to it, and the back walk in the house is less obstructed by the pots.

XXVII. *On the* Variation in the Colour of Peas, *occasioned by Cross Impregnation. In a Letter to the Secretary. By Mr.* John Goss.

Read October 15, 1822.

Sir,

Living retired in the country, and having a taste for gardening, I have been for some years past endeavouring to raise new varieties of vegetables. A gentleman in the neighbourhood, seeing some of the fruits of my labours, put into my hands the *Transactions* of your Society: this was like the rising sun after the dawn, and I was enabled to see, not only how to do my work better, but that some things which occupied my attention had by others been already accomplished.

I have raised some *new varieties of Peas,* and as one of these appears to be at least a singular production, and finding very little on this subject in your volumes, I am tempted to give you a description of it, accompanied with a few observations.

In the summer of 1820, I deprived some blossoms of the *Prolific blue* of their stamina, and the next day applied the pollen of a *dwarf Pea,* and of which impregnation I obtained three pods of seeds.* In the following spring, when these

* I have not been able to ascertain with certainty the names by which the two parent Peas are usually known by gardeners and seedsmen; but I believe that the Prolific Pea, which was the female parent of the new variety, is the *Blue Prussian,* and the dwarf Pea which was its male parent, the *Dwarf Spanish.*

were opened, in order to sow the seed, I found, to my great surprise, that the colour of the Peas, instead of being a deep *blue,* like their female parent, was of a *yellowish white,* like the male. Towards the end of the summer I was equally surprised to find that these white seeds had produced some pods with all blue, some with all white, and many with both blue and white Peas in the same pod.

Last spring, I separated all the blue Peas from the white, and sowed each colour in separate rows ; and I now find that the blue produce only blue, while the white seeds yield some pods with all white, and some with both blue and white Peas intermixed.

The edible qualities of this Pea I have not tried, having but few. It grows two or two feet and a half high, and attains maturity about the same time with its blue parent, which it much resembles, and unfolds a large, deep green rich foliage, superior to any I have seen. It seems to require a greater depth and richness of soil than other sorts, or than I have given it.

Should this new variety of Pea neither possess superior merit, nor be deemed singular in its bi-coloured produce, yet there is, I conceive, something in its history that will emit a ray of physiological light, or at least militate against an opinion held by Mr. Salisbury, who, in his remarks on the anomaly of the Peach and Nectarines growing on the same branch, says,* " I have not a doubt of the important consequences which ensue, when the stigma of one plant imbibes pollen belonging to another, but these are only manifested in the *succeeding generation.*"

* Horticultural Society's Transactions, Vol. I. page 105.

That this is incorrect, is not here "determined by a more able physiologist," but by the above statement—by the above fact; for the effect was strikingly evident in the seed, which was changed by the impregnation from a deep blue to a yellowish white. And if the seed undergoes such a change, why may not the fruit? It is more than probable that it does; but, the change not being so conspicuous as the difference between blue and white, it has escaped observation. Perhaps the most effectual way to unravel the mystery of the anomaly, would be to impregnate a considerable number of Peach blossoms with the pollen of the Nectarine, and to examine minutely if any change succeeded in the fruit.

If this communication should be thought worthy to appear in your *Transactions*, I trust Mr. Salisbury will excuse an humble attempt to reflect a little light on an obscure part of a science in which he himself is so luminous.

I am, Sir,

Yours respectfully,

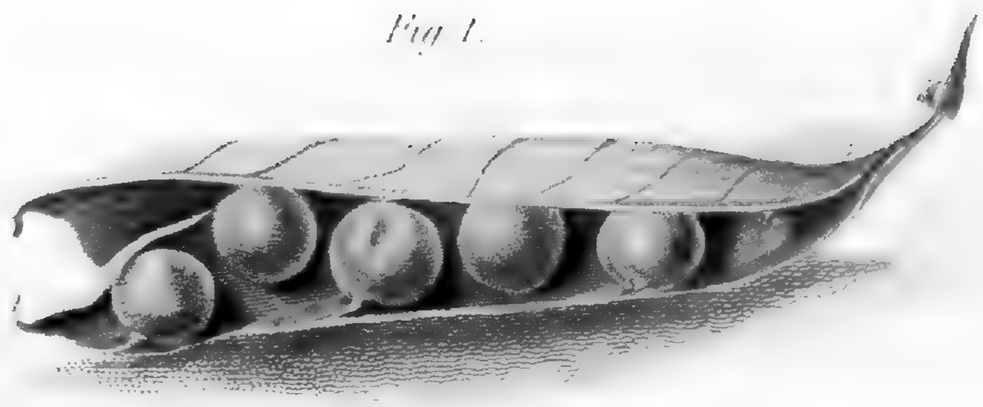
John Goss.

Hatherleigh, Devonshire,
October 5, 1822.

Note by the Secretary.

Previous to the receipt of the above communication, one on the same subject was transmitted by Alexander Seton, Esq. and read at the Meeting of the Society on the 20th of August, 1822. Mr. Seton had happened to make a similar experiment, by impregnating the flowers of the *Dwarf Imperial*, a well known green variety of the Pea, with the pollen of a white free growing variety. Of the flowers so treated one

Fig. 1.



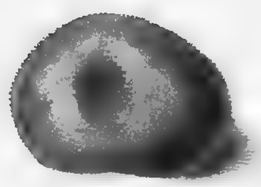
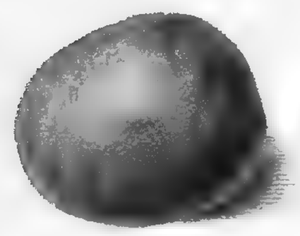


Fig. 2.



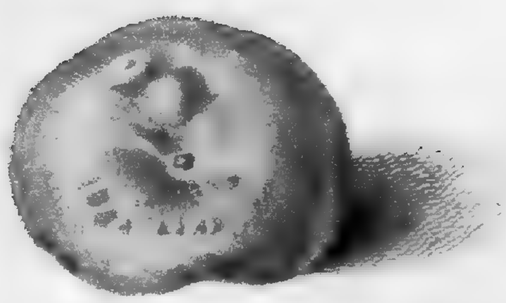
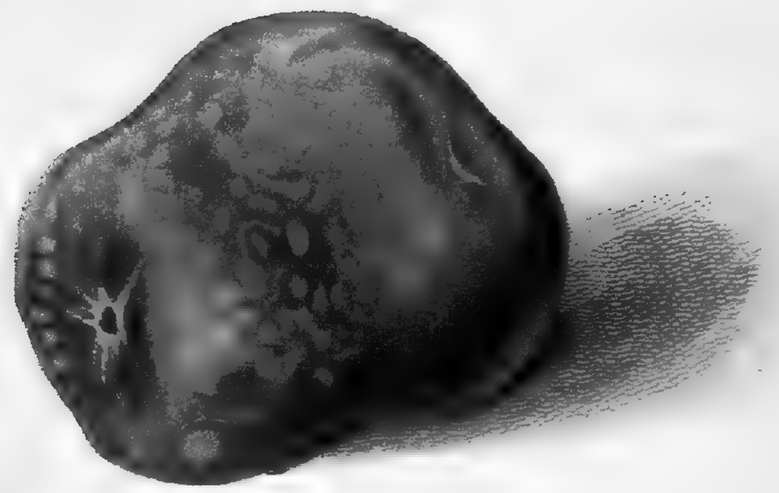


Fig. 3.



only produced a pod, and it contained four Peas, which did not differ in appearance from the others of the female parent. It thus appears from the different results in this stage of the experiments made by Mr. Goss and Mr. Seton, that the appearance of the fruit in the first instance is sometimes affected by extraneous impregnation, and sometimes not; the impregnation being effectual, as it was proved to have been, by the progeny in both of these instances, and it seems desirable that this interesting point, on which so much difference of opinion has arisen,* partly from observation, and partly from analogical reasoning, should be subjected to further experiment.

The plants which grew from the four Peas obtained by Mr. Seton, seemed to partake of the nature of both parents, being taller and more diffuse than the Dwarf Imperial, and less so than the male white parent; but the pods resembled those of the former, being short, and having but few Peas in each. On their ripening it was found that instead of their containing Peas like those of either parent, or of an appearance between the two, almost every one of them had some Peas of the full green colour of the Dwarf Imperial, and others of the whitish colour of that with which it had been impregnated mixed indiscriminately and in undefined numbers; they were all completely either of one colour or the other, none of them having an intermediate tint, as Mr. Seton had expected. The representation of one of the pods in Plate IX. Fig. 1. conveys a very perfect idea of its appearance.

* See observations on the accidental intermixture of character in certain fruits, at page 63 of the present Volume.

XXVIII. *A new and improved Method of* Cultivating the Melon. *By* Thomas Andrew Knight, *Esq. F. R. S. &c. President.*

Read November 15, 1822.

I have described, in a preceding paper,* a new kind of hot-bed, into which by means of a hollow wall, a heated current of air is made at all times to enter, without any mixture of the vapour arising from the fermenting material; and in which the temperature is raised and supported by a rapid change of air, instead of being lowered, as it is in every other kind of hot-bed, with which I am acquainted.

My object in the construction of this hot-bed, was the culture of the Pine Apple; but I employed it in the last summer in raising Melons; and I succeeded so much more perfectly, than I had ever previously done, that I am led to hope the following account of the mode of culture adopted, will be honoured by the approbation of the Horticultural Society.

Before I began to raise my Melon plants, I calculated, as I think every gardener ought to do, who cultivates this fruit, the amount in weight which I might expect to obtain in perfection, from a given extent of glass roof. The heaviest crop of good Grapes, which I had ever seen growing in a forcing-house, did not appear to me to exceed a pound to every fifteen inches square, of glass roof, taking into the admeasurement, every part of such roof. The Vines had, in such cases, lived

* See page 223 of this volume.

through many successive seasons, and possessed a large extent of roots and branches, every where amply stored with the true sap, or living blood, of the plant generated in a preceding season; and possessing powers relative to vegetable life, analogous to those of the blood of torpid animals. Their blossoms and minute leaves had also been the product of the labour of a past season. The Melon plants had, on the contrary, every thing to accomplish; not only in a single season, but in a small part of such season: and therefore I considered a pound of fruit to every fifteen inches of glass roof, to be the largest amount of perfect fruit upon which I could venture to calculate. The variety of Melon, which I proposed to cultivate, was a Persian kind, chiefly grown in the vicinity of Ispahan, whence it takes its name. Its form is nearly that of a Cucumber, acquiring frequently more than a foot in length, and weighing about seven pounds. It possesses, in my estimation, very great excellence as a fruit; but it is of very difficult culture, the blossoms not setting freely: and the fruit, on account of the excessive thinness of its skin, being very subject to decay prematurely in the damp atmosphere of an ordinary hot-bed: and I had, on these accounts, for some years wholly ceased to cultivate it.

Having already described, with sufficient minuteness, the mode of construction and plan of my hot-bed, I need not, at present, do any thing more than describe the manner in which my plants were managed in the last season; they were not planted till late in the spring, and therefore did not produce blossoms capable of affording fruit, till the second week in July; and it had consequently, in the last season, to grow

and ripen under a very cloudy sky. Each plant was placed by itself in a pot of about eighteen inches in diameter in its widest part, and of about a foot deep, inside measure, the mould in them being very rich and light, and constantly kept sufficiently moist with manured water; and the number of pots was equal to the number of Melons, which I proposed that my hot-bed should contain at one time. These pots were supported at the south and lowest side of the bed about fourteen inches below the glass roof; and the plants were trained upon a trellis at the same distance from the roof, and parallel to it. By these means, and by giving to each plant a similar extent of space, I expected to see each Melon swell, and be equally well fed and ripened; and I calculated upon the further advantages of being able to give, or to withhold, water from each plant according to the state of growth, or approaching maturity of its fruit: and also upon that of being able to introduce other pots and plants, as soon as I had gathered the produce of each plant. My success in every respect wholly exceeded my expectations, the bed proving an instrument of much greater powers than I had calculated upon; and I was assured by Sir Harford Jones, who first supplied me with seeds of the variety, (which he had brought from Persia,) that he had never seen plants of more healthy growth, nor with fruit better swelled, even in its native climate. The only enemy with which the gardener will, I believe, have to contend, is the red spider, and against the attacks of this he must guard his plants, by frequently sprinkling their leaves lightly with clear warm water.

I had a singular opportunity in this experiment of obtain-

ing evidence of the truth of an opinion, which I gave many years ago in the *Transactions of the Horticultural Society,** that every leaf, even the most distant, of a Melon-plant, contributes to feed its fruit. One of my plants exhibited appearances which led me to conclude that a fruit was set, and was swelling rapidly upon it. My gardener, on the contrary, was very positive that no such fruit existed; and having myself searched in vain to find it, I was compelled to relinquish my opinion; this however I resumed upon observing the habit of the plant two days afterwards, when I ordered the lights to be taken off, and every branch to be minutely examined; it was then discovered, that a Melon, at the extremity of a straggling branch, had fallen through the trellis, and was hanging half a yard below it. In this situation, it had been entirely shaded by the crowded foliage of another plant; but nevertheless it had grown in less than fourteen days to be nearly a foot long, and it weighed at least four pounds. That it had derived the material necessary to its rapid growth from the sap of the parent plant cannot, I think, be doubted: and the evidence that the most distant part of the plant contributed to feed it, is certainly extremely strong; for the fruit grew at the distance of at least six feet from those parts of the plant, which led me to infer its existence.

By what means the sap generated in the distant foliage, was carried to this fruit in sufficient quantity, is a very interesting question to the physiologist, and not less so to the scientific gardener.

I have at different periods made an immense variety of

* Vol. i. page 223.

experiments to ascertain by what organs, and under what circumstances, the lifeless inorganic matter, which is absorbed by the roots of plants, becomes converted into their true sap, or living vegetable blood; and the result of every experiment has led me to believe, that in all cases where plants possess leaves, as distinct organs, it is in such organs alone, and under the influence of light, that this process takes place. The powers, which roots of various forms and cuttings, and other detached parts of plants, possess of emitting foliage have appeared to me to be wholly, in all cases, dependent upon the presence of true sap previously deposited within them. Like the cotyledon of seeds they appear to be reservoirs only, which contain, but never create: and it has been long ascertained that seedling plants perish, or at best scarcely retain life, if deprived of their cotyledons, even after the radicle has penetrated deeply into the soil, and the elongated plumule has reached its surface; a discovery which appears to be universally given to Bonnet; but which belongs to Malpighi.

The following experiment, with many others which I could adduce, appears to prove that powers have been given to the mature leaf, which have been denied to the roots and branches of plants, and to the cotyledons of their seeds, unless the latter expand into, and assume, as they in many cases do, the form and office of leaves. In an early part of the summer some leaves of Mint, (Mentha piperita,) without any portion of the substance of the stems, upon which they had grown, were planted in small pots, and subjected to artificial heat, under glass. They emitted roots and lived more than twelve months, having assumed nearly the character of

the leaves of ever green trees: and upon the mould being turned out of the pots, it was found to be every where surrounded by just such an interwoven mass of roots, as would have been emitted by perfect plants of the same species. These roots presented the usual character of those organs, and consisted of medulla, alburnum, bark, and epidermis; and as the leaf itself, during the growth of these, increased greatly in weight, the evidence that it generated the true sap, which was expended in their formation, appears perfectly conclusive.

Supposing the leaves of the Melon plant to possess (as I do not entertain a shadow of doubt that they do) powers similar to those of the Mint above mentioned, and of other plants; and that all the foliage may be made to contribute to feed a single fruit, it is not easy to conceive by what means this can be done, without the circulation of a very large portion of the true sap of the plant, even of that generated in its most distant foliage, through such single fruit, be assumed. And it appears difficult upon any other grounds to account for the extremely rapid growth which, under such circumstances, takes place in a single fruit, with the influence of the fruit upon the most distant parts of the plant, and the dependence of the ultimate weight and perfection of the fruit upon the extent of the foliage of the plant. In an experiment which I made some years ago, a single Melon, of the Rock Canteloup variety, grew upon a plant which occupied more than thirty feet of the surface of a hot-bed, but under green glass of ordinary quality: where it acquired the weight of thirteen and a half pounds, having during its growth given the whole plant full employment, and apparently put the services

of every leaf in requisition, though some of them grew at nearly six feet distance from it.

The disadvantages of leaving too numerous a crop on any plant are sufficiently well known, and every skilful gardener is able to calculate, from the extent and vigour of his Melon plants what number of fruits, of any given variety, each plant is capable of supporting; but when a Melon plant has many fruits to support, it is often a partial parent, by which one offspring is very abundantly fed, whilst another starves; and hence often arises the great disparity in the quality of fruit of the same plant.

This cannot occur when each plant has a single fruit only to support, and is given a sufficient extent of foliage: and under this mode of culture, the most shy, and the most free bearer, become equally productive, for every plant, will readily offer all that is wanted, a single fruit.

I have already stated that I think a Melon plant of any saccharine variety, will require about fifteen inches square of glass roof for every pound of fruit; and in this calculation I include glass of good quality. There may possibly be varieties of the Melon which will afford a larger produce, than that abovementioned; but whatever variety be cultivated, I feel confident that quite as large a produce may be obtained by the mode of culture above recommended, as by any other; and I cannot but believe a larger produce of good fruit, owing to the advantages of a constant supply of warm air, and the power of giving, and of permanently maintaining, in the bed a high and regular temperature, without the introduction of steam, and the power of securing to each fruit its due share of nutriment. I am also of opinion, that great

advantages might be thus obtained in the very early culture of the Cucumber. The cavity of the bed might be filled with leaves or other material which would afford a temperate and permanent heat; whilst a current of warm and dry air would be made to flow constantly into the bed above the level of the mould in which the plants were placed. When the bed is intended for this purpose, the perforations through the bricks should be confined to those which stand above the level of the mould.

As soon as the crop of Melons in my bed was expended, the pots were removed, and others of smaller size, and containing Pine Apple plants, were introduced and supported upon a frame of wood at proper distance from the glass, a new lining being at the same time given to the bed. These plants have subsequently thriven exceedingly, and I entertain no doubt of their continuing to thrive through the winter; for the powers of a constant, though small, current of heated air to sustain a high temperature are very great, operating not only by introducing heat, but also in opposing the ingress of the cold external air, a circumstance to which I particularly wish to attract the attention of the gardener.

I will take this opportunity of suggesting an improvement in the construction of the common Pine stove. If the wall which surrounds the bark-bed were made hollow, and its cavity given a communication, beneath the soil, (as in the hot-bed I have described,) at its lower corners, with the external air, that would pass into the cavity of the wall, and escape into the house through passages immediately beneath the coping of such walls; and warm air might be thus at all times freely introduced with much advantage to the plants,

and in winter with a very considerable diminution of the expenditure of fuel; and indeed I feel perfectly confident that by the proper application of hollow walls in a shed behind a hot-house, every kind of forcing culture might be successfully carried on without the use of a particle of fuel, and with a moderate quantity only of bark, or leaves, or other fermenting material.

XXIX. *On the Cultivation of the* Alpine Strawberry. *In a Letter to the Secretary. By* John Williams, *Esq. C. M. H. S.*

Read September 3, 1822.

Dear Sir,

The practice of raising the *Alpine Strawberry* from seed annually, appears to me so far inferior to the cultivation of it by runners, that I send you a short account of my method. The fruit of plants raised from seed comes in very well as a late autumn crop, but is certainly inferior in flavour to that produced from transplanted runners.

I possess two seminal varieties, which are rather larger and sweeter than Alpine Strawberries in general, from these I take runners in August or September, and plant a bed near to the garden pump or pond. By the following spring the bed will be well stocked with plants, and early in the month of May, when they are in full flower, I cut away all the blossoms, preserving the leaves uninjured, this is again repeated at the end of the month. Towards the middle or end of June more blossoms appear, and the plants afford flowers and fruit, all the latter part of the summer, and till cut off by the autumnal frosts. If the first blossoms were not removed, the principal crop of Alpines would be ripe at the time the larger Strawberries are in season, and consequently of little worth; but by this mode of culture, they come into bearing in the

latter part of the summer, just at the time the other kinds are over.

I am, dear Sir,

Yours very truly,

JOHN WILLIAMS.

Pitmaston,
July, 18, 1822.

XXX. *On the Native Country of the* Wild Potatoe, *with an Account of its Culture in the Garden of the Horticultural Society; and Observations on the Importance of obtaining improved Varieties of the cultivated Plant. By* Joseph Sabine, *Esq. F. R. S. &c. Secretary.*

Read November 19, 1822.

The possession of the plants of the *Native Wild Potatoe* has been long a desideratum, and from the great importance and extensive use of the cultivated root, the subject of course became an object of attention to the Horticultural Society. In my communications with the Society's correspondents, on the other side of the Atlantic, this was pointed out as one of the most interesting objects, to which their attention could be directed; and it is with no small satisfaction, that I am able to state that our enquiries have been successful.

Great doubts have existed as to what parts of the new world the natural habitat of the Solanum tuberosum or Potatoe, should be assigned; and the question is even now a matter of discussion among Botanists of the greatest eminence. The vegetable in its cultivated state was first known in this country as the Potatoe of Virginia; I conceive, however, there can be little doubt that the plants which Sir Walter Raleigh found in that colony, and transferred to Ireland, had been previously introduced there from some of the Spanish territories, in the more southern parts of that quarter of the globe; for had the Potatoe been a native of any dis-

trict, now forming part of the United States, it would before this time have been found and recognised, by the botanical collectors, who have traversed and examined those countries.

From the Baron de HUMBOLDT's observations on the Potatoe in Mexico,* it seems certain that it is not wild in the south-western part of North America; nor is it known otherwise than as a garden plant in any of the West India islands. Its existence, therefore, remains to be fixed in South America, and it seems now satisfactorily proved, that it is to be found both in elevated places in the tropical regions, and in the more temperate districts on the western coasts of the southern part of that division of the new world.

According to MOLINA,† it grows wild abundantly in the fields of Chili, and in its natural state is called by the natives *Maglia*, producing, when uncultivated, small and bitter tubers. The Baron de HUMBOLDT asserts,‡ that it is not indigenous in Peru, nor on any part of the Cordilleras situated under the Tropics. But this statement is contradicted by Mr. LAMBERT§ on the authority of Don JOSE PAVON and of Don FRANCISCO ZEA, the former of whom says, that he and his companions, DOMBEY and RUIZ, had not only gathered the Solanum tuberosum wild in Chili, but also in Peru, in the environs of Lima; and the latter has assured Mr. LAMBERT, that he had found it growing in the forests near Santa Fé de Bogota. The above account of PAVON is further confirmed by the evidence

* Political Essay on the Kingdom of New Spain. BLACK's Edition, Vol. II. page 484.

† Hist. Nat. du Chili, p. 102.

‡ Political Essay on the Kingdom of New Spain. BLACK's edition, Vol. II. page 489.

§ Journal of Science and the Arts, Vol. X. page 25.

of a specimen gathered by him in Peru, and now forming a part of the herbarium of Mr. Lambert, with the name of "Patatas del Peru."

Mr. Lambert, in his communication to the *Journal of Science and the Arts*, which I have referred to, supposes that the Wild Potatoe is to be found on the eastern, as well as the western and northern sides of South America. His opinion on this point appears to have been founded on the following circumstances.

Among the specimens in the Herbarium formed by Commerson, when he accompanied Bougainville in his voyage round the world, is one of a Solanum, gathered near Monte Video. In the *Supplement to the Encyclopedie*, (Vol. III. page 746,) this specimen was described on the authority of M. Dunal of Montpelier, as belonging to a species distinct from Solanum tuberosum, under the name of Solanum Commersonii, and it was subsequently published by M. Dunal, with the same name in the *Supplement* to his *Solanorum Synopsis*.* (The article from the Encyclopedie is given below.†) Mr. Lambert, however, conjectured this specimen to be that of the type of the cultivated Potatoe, and was induced to do so, by information received from Mr. Baldwin,

* Page 5.

† Morelle de Commerson. Solanum Commersonii. Solanum caule herbaceo, piloso; foliis pinnatis sublyratis, pilosis: floribus corymbosis, terminalibus; pedicellis articulatis. Dun. Suppl. Sol. MSS.

Toute la plante est converte de poils simples; elle a les plus grands rapports avec le Solanum tuberosum; elle en diffère, 1°. par ses feuilles profondement pinnatifides comme celle de la Pomme de terre, mais dont les folioles sessiles ne sont pas alternativement inégales. 2°. par la foliole impaire, qui est très grande. 3°. par la corolle, qui est à cinq divisions non à cinq angles. La racine de cette plante est encore inconnue.

an American botanist, that he had found the Solanum tuberosum wild, both at Monte Video, and in the vicinity of Maldonado, as well as from Captain Bowles, who had resided a considerable time at Buenos Ayres, and who had told him that this plant was a common weed in the gardens and neighbourhood of Monte Video.

The above statements certainly confirm the existence of a plant in sufficient abundance near the shores of the Rio de la Plata, which Mr. Lambert identifies with Commerson's specimen; but the proof that it is the Solanum tuberosum, in opposition to the decision of Mr. Dunal, rests only on the opinion of Dr. Baldwin, and Captain Bowles, without the usual satisfactory evidence of specimens, which have not been supplied by either of these gentlemen.

In order to elucidate the question as much as possible, I applied to M. Desfontaines, Director of the Museum of Natural History in the Jardin du Roi at Paris, for permission to have a drawing made of Commerson's original specimen, which was deposited in the Herbarium under his charge. With a liberality and kindness which I cannot too highly compliment, the entire specimen was without delay transmitted to me. An inspection of the annexed engraving (see Plate X.) which is correctly made from the whole of the plant preserved, will probably decide the question as far as respects Commerson's plant. It will be observed that the specimen has much the appearance of being in a dwarf or stunted state. The label affixed to it is thus inscribed: "Hispanis Tomates—flores sunt palliduli—de la plage du pied du Morne de Monte Video en Mai, 1767." The size of the blossom is evidently larger than that of the S. tuberosum

Solanum Commersonii.

under similar circumstances; the depth of the divisions of the flowers, and the larger proportional size of the terminal leaf, present striking differences from correspondent parts of the common Potatoe. Very little hairiness is perceptible on the specimen, which, if it had been taken from a plant of S. tuberosum, would probably have been much more hairy, as it usually is when stunted. It is also somewhat singular that Commerson, who could not but know the S. tuberosum and its various names, should have affixed that of "Tomates" to his specimen; this makes it almost certain that he did not consider it to be the Potatoe. On these grounds I have ventured to hesitate in concurring in the opinion of Mr. Lambert, that we have sufficient evidence of the growth of the wild Potatoe in the neighbourhood of the Rio de la Plata. It possibly may be found there, but its existence in that part of America is not proved, since it seems tolerably certain that Commerson's plant is not it, and Mr. Lambert does not suppose that the plants seen by his correspondent and friend were different from Commerson's.

Early in the spring of the present year, Mr. Caldcleugh, who had been some time resident at Rio Janeiro, in the situation of Secretary to the British Minister at that Court, where he had been indefatigable in his exertions to forward the objects of the Horticultural Society, returned to England, having previously taken a journey across the country, and visited the principal places on the western coasts of South America. Among many articles of curiosity which he brought with him, were two tubers of the *Wild Potatoe*, which he sent to me with the following letter:

Montague Place, Portman Square,
February 24th, 1822.

My dear Sir,

It is with no small degree of pleasure that I am enabled to send you some specimens of the Solanum tuberosum or Native Wild Potatoe of South America.

It is found growing in considerable quantities in ravines in the immediate neighbourhood of Valparaiso, on the western side of South America, in lat. 34½ S. The leaves and flowers of the plant are similar in every respect to those cultivated in England, and elsewhere. It begins to flower in the month of October, the spring of that climate, and is not very prolific. The roots are small and of a bitterish taste, some with red and others with yellowish skins. I am inclined to think that this plant grows on a large extent of the coast, for in the south of Chili it is found, and called by the natives *Maglia,* but I cannot discover that it is employed to any purpose.

I am indebted for these specimens to an officer of His Majesty's ship Owen Glendower, who left the country some time after me.

I am, my dear Sir,

ever sincerely your's,

Alexander Caldcleugh.

The two tubers were exhibited to the Society, and a drawing made of them before they were planted (see Plate IX. fig. 2.) Had there been a third I should have been tempted to have satisfied myself as to the real flavour which Mr. Caldcleugh, as well as Molina, describes as bitter. They were planted separately in small pots, and speedily vegetated; they grew rapidly, and were subsequently turned out into a

Solanum tuberosum (wild Potatoe.)

border at about two feet distance from each other, when they became very strong and luxuriant. The blossoms at first were but sparingly produced, but as the plants were earthed up they increased in vigour, and then bore flowers abundantly; but these were not succeeded by fruit. A drawing of a branch was made by Miss Cotton, which has been engraved (see Plate XII.) The flower was white, and differed in no respect from those varieties of the common Potatoe which have white blossoms. The leaves were compared with specimens of several varieties of the cultivated Potatoe, which generally were rather of a more rugose and uneven surface above, and with the veins stronger and more conspicuous below, but in other respects there was no difference between them. The pinnulæ which grew on the sides of the petiole, between the pinnæ of the leaves, were few, not near so numerous as in some varieties of the cultivated Potatoe; but in specimens of other varieties that were examined, their leaves were destitute of pinnulæ, so that the existence of these appendages does not appear to be so essential a characteristic as has been supposed, and as is stated in the *Supplement to the Encyclopedie.*

The earth with which the plants had been moulded up had been applied in considerable quantity, so as to form a ridge, the sides of which were full two feet high; and about the month of August runners from the roots and joints of the covered stems protruded themselves towards the surface of the ridge in great numbers, and when they reached the light, formed considerable stems, bearing leaves and blossoms, so that at length the two plants became one mass of many apparently different plants issuing from all sides of the ridge.

The appearance of these runners in such quantities induced a doubt as to the identity of the plant with our common Potatoe, which doubt was increased when it was ascertained, that so late as the month of August no tubers had been formed by the roots. The runners were however no otherwise different from what are formed by the cultivated Potatoe under ground, except that they were more vigorous, as well as more numerous.

The plants have recently been taken up, and all doubt respecting them is now removed; they are unquestionably the Solanum tuberosum. The principal stems, when extended, measured more than seven feet in length; The produce was most abundant, above six hundred tubers were gathered from the two plants; they are of various sizes, a few as large or larger than a pigeon's egg, others as small as the original ones, rather angular, but more globular than oblong; some are white, others marked with blotches of pale red or white; two of these were selected to be drawn, and are represented at Figure 3, in Plate IX. The flavour of them when boiled was exactly that of a young Potatoe.

The compost used in moulding up the plants was very much saturated with manure, and to this circumstance I attribute the excessive luxuriance of the growth of the stems; had common garden mould been applied, they would not probably have grown so strong, and I suppose that whilst the plants were thus rapidly making stems and leaves, the formation of the tubers was delayed, for the production of these has been the work of the latter part of the season; they cannot be called fully ripe, nor have they attained the

size which they probably might have done if they had been formed earlier.

They will however answer perfectly for the purpose of reproduction (or for seed, as it is technically called,) and they are in sufficient plenty to be subjected to treatment similar to a common crop of Potatoe. The result of another year's experience is necessary to enable us fully to observe on the merits and value of this new introduction; but the following changes already appear to have attended its subjection to cultivation;—the produce is most abundant, the tubers have lost all the bitterness of flavour which is attributed to them in the natural state, and their size is increased remarkably; from all which circumstances I am disposed to infer, that the original cultivators of this vegetable did not exercise either much art or patience in the production of their garden Potatoes.

The increased growth of the Potatoe, not only in these kingdoms, but almost in every civilized part of the globe, has so added to its importance, that any information respecting it has become valuable; the subject of this communication may therefore not be without interest. With the exception of wheat and rice, it is now certainly the vegetable most employed as the food of man; and it is probable that the period is at no great distance, when its extensive use will even place it before those which have hitherto been considered the chief staples of life. The effect, of the unlimited extent to which its cultivation may be carried, on the human race, must be a subject of deep interest to the political economist. The extension of population, will be as unbounded as the production of food, which is capable of being produced in very

small space, and with great facility; and the increased number of inhabitants of the earth will necessarily induce changes, not only in the political systems, but in all the artificial relations of civilized life. How far such changes may conduce to, or increase the happiness of mankind, is very problematical, more especially when it is considered, that since the Potatoe, when in cultivation, is very liable to injury from casualties of season, and that it is not at present known how to keep it in store for use beyond a few months, a general failure of the year's crop, whenever it shall have become the chief or sole support of a country, must inevitably lead to all the misery of famine, more dreadful in proportion to the numbers exposed to its ravages.

Under such circumstances, and with such a prospect, it is surely a paramount duty of those who have the means and power of attending to the subject, to exert themselves in selecting and obtaining varieties of Potatoes, not only with superior qualities in flavour and productiveness, but which shall be less subject to injury by changes of weather when in growth, and which may possess the quality of keeping for a length of time, either in their natural state, or under the operation of artificial treatment. This is one of the objects to which the care and energies of the Horticultural Society ought to be directed. Under its auspices, and by its means, some new kinds have been brought into notice, but a wide field of exertion is still before it. With the Potatoes cultivated in South America at the present time we are very little acquainted; there is one especially which has been heard of, but which has not yet reached us, known at Lima as the Yellow or Golden Potatoe, and which is

reported to be far superior in flavour to any now grown in Europe.

On the subject of the Potatoe there is also a point of curiosity and much interest open to those who have leisure and opportunity of conducting the investigation. Several accounts of its introduction into Europe, and especially into Great Britain and Ireland, are before the public, differing from each other, and none exactly correct; the entire truth is probably to be extracted from the whole, and ought to be supported by references to the original authorities for the different facts. To these, in order to render the early history of the Potatoe complete, an account of its original discovery, and the observations made on it by the first and early visitors to the shores of South America, should be obtained; and this research would probably lead to a detection of the circumstances attending its first introduction into Virginia, which is at present involved in obscurity.

XXXI. *Notices of New or Remarkable Varieties of Fruits, ripened in the Summer and Autumn of the year* 1821, *which were Exhibited at Meetings of the Horticultural Society.*

Strawberries.

The Rev. Thomas Garnier sent to the Meeting, on the 19th of June, specimens of the *Roseberry Strawberry,* which had attained to a very large size without any deterioration of flavour. This variety, which is now in general cultivation, was first noticed and a very accurate figure of it given in the second volume of the *Society's Transactions,* page 378, and is now again mentioned for the purpose of correcting a mistake which occurs in that account of it. It is stated in the page above referred to, that " some years since Messrs. John and William Cadenhead, very considerable market gardeners near Aberdeen, observed a single plant of this Strawberry (which had probably originated from an accidentally sown seed) in their garden, and from certain peculiarities noticed in it, were induced to increase it." It has since been ascertained that the variety was raised from seed, about twelve years ago, in the garden of Robert Davidson, Esq. at Aberdeen. Mr. Davidson having at first observed the vigorous growth of the plant, and afterwards its great fertility, gave it to Messrs. Cadenhead, by whom it was named, and made public.

Mr. Michael Keens, of Isleworth, exhibited at the same Meeting, specimens of the *Princess Charlotte Strawberry,* a

Varieties of Seedling Strawberry.

seedling variety raised by him from the Pine Strawberry. It is about the size of the Carolina, and like it, is globular; the colour is dark, penetrating nearly to the centre, which is without cavity. The seeds are dark, and not deeply embedded in the flesh; the calyx is reflexed, but without any disposition in the fruit to elongate at the neck, as is usual in the sorts that have that peculiarity. It is an abundant bearer, and the flavour of the fruit is of the highest quality.

Mr. Keens also sent to the Meeting, on the 3rd of July, specimens of a new Strawberry, raised by himself, which he has subsequently named *Keens' Seedling*. The fruit is generally as large as the finest of his Imperials,* from the seed of which the Strawberry in question was raised. The largest berries have somewhat of a cockscomb shape, but with little regularity; they measure in their greatest diameter near two inches, in their narrowest an inch; and an inch and a half in depth. The colour is a very rich deep red, staining a considerable way into the flesh, which is white only at the centre, and in several rays stretching from thence to the outside. The calyx is large, partially reflexed; the seeds small, yellow, deeply imbedded. The flesh is tender, free from fibre, close, or nearly so, at the centre, very juicy, and in flavour approaching to the Pine Strawberry. The plants are remarkably prolific, very free growers, and possess the desirable habit of bearing their fruit high from the ground. The annexed figure, from a drawing made by Mr. Charles John Robertson, conveys a very perfect idea of the fruit.

At the Meetings of the Society on the 3rd of July and 7th of August, Mr. John Wilmot exhibited specimens of a new

* See Horticultural Society's Transactions, Vol. ii. page 101.

Strawberry, raised from the seed of Keens' Imperial, which has been named *Wilmot's Coxcomb Scarlet*. The berries are larger than the old Scarlet; those which ripen first are remarkably cockscomb-shaped, the berry being flattened and extended sideways, so much as completely to envelope the calyx; the succeeding fruits are round, with a considerable depression at the head. When fully ripe, the colour is as rich as that of the old Scarlet, and it penetrates in broad rays a considerable way towards the centre. The flavour is rich and sprightly. The fruit stalks are flattened so as to have the appearance of two growing together. The plants are very fertile, and remain a long time in bearing, yielding a strong succession of fruit, which they carry high from the ground. The variety is most remarkable, both on account of its singularity of shape, and of its beautiful appearance.

Cherries.

Specimens of a new Cherry were received from Thomas Andrew Knight, Esq. on the 16th of July, which it is proposed to call the *Downton Cherry*. It is very blunt, heart-shaped, nearly round, slightly depressed at the point, and a little flattened on one side, where a very small suture extends from the insertion of the stalk to the point. In colour it nearly resembles the Elton, being a pale yellow sprinkled with numerous minute red spots, with larger patches of dull red or maroon, its general colour being something deeper than that of the Elton. The stalk also is shorter than that of the Elton, and deeply inserted. The flesh is of a pale amber colour, transparent, without any stain of red, adhering slightly to the

stone, tender and juicy, very sweet and high flavoured. The stone small and nearly round. This variety was raised from either the Elton, or Waterloo Cherry; but from the circumstance of stones of both having been sown in the same bed, Mr. KNIGHT cannot be certain which of the two is the parent. The plant being young, it may be safely inferred, that the present excellence of its produce will be much increased by time.

NUTS.

Mr. GEORGE LINDLEY sent to the Meeting on the 16th of October, specimens of the *Frizzled Filbert*, a valuable variety which he believes is not grown any where except in the county of Norfolk. There is no apparent difference in the tree from the common Filbert, but it is much more prolific, owing probably to its blossoming later than any other kind. The husk is much longer than the nut, longer, even, than in the common Filbert; and is remarkably plaited or frizzled. The nuts grow, generally, in clusters of two or three, and are of excellent flavour.

GRAPES.

WILLIAM ATKINSON, Esq. sent from his garden at Grove End, St. John's Wood, on the 7th of August, some bunches of a white Grape, which has been called the *Grove End Sweetwater*, its real name being unknown. The plant was an imported one, but is certainly new to this country. The fruit ripens on the open wall more than a fortnight before any other Grape. The bunches in general are rather smaller than the Royal Muscadine, and shoulder more than the

Sweetwater. The berries are somewhat of an oval shape, of a transparent green when forced in the house; against the open wall they take a tinge of brown on the exposed parts; the skin is thin, the pulp tender, sweet, and rich. It is probably a variety of the Chasselas. Not only its earliness, but its superior quality for the table, strongly recommend it to notice.

Mr. John Wilmot exhibited bunches of a hardy seedling Grape grown in his garden, the original plant of which he had met with growing against the wall of a house at Wantage, in Berkshire, where it had been raised from the seed of a dried raisin some years ago. It has been called the *Wantage Grape*. The bunch is very large, berries nearly round, with the complexion of the Grizley Frontignac, but not quite so brown, and of a very excellent flavour. As a hardy Grape it is of superior quality to many of the old sorts, and its great fertility recommends it for the open wall.

Pines.

At the Meeting on the 17th of July, a *New Providence Pine* was exhibited, sent by Lord Cawdor from his garden at Stackpool Court, Pembrokeshire, where it was grown by Mr. William Buchan, his Lordship's gardener. This was larger than any Pine which has been exhibited to the Society, and with the exception of a few which have been grown by Mr. Baldwin, is the heaviest, as far as has been ascertained, that has been fruited in this country. It weighed 10lb. 8 oz. was ten inches and a half high, exclusive of the crown and stalk,

and was twenty-two inches in circumference. From the extraordinary size and beauty of the fruit, it was thought proper by the Fellows of the Society at the Meeting, that it should be presented to His Majesty, which was accordingly done, and it was served up in the dessert at the Royal table, at the Coronation banquet. Mr. Buchan fruited three other Providence Pines, of extraordinary weight, in the same season; one weighed ten pounds six ounces, another ten pounds two ounces, and a third nine pounds eight ounces, making the total weight of the four forty pounds eight ounces.

Mr. Isaac Oldaker sent from the garden of Lady Banks, at Spring Grove, a fruit of the *Russian Globe Pine Apple.* Plants of this variety were received by the Society in the year 1819, from St. Petersburgh, and by one of these the present fruit was produced. The plant grows erect, the leaves are broad and deeply serrated, of a shining brown colour when young, but when full grown nearly of the colour of those of the Queen Pine. The fruit is large, and globular, the pips large and flat, the flesh is yellow, fine in texture, and of a high flavour. The plant fruits freely, and from its superiority deserves a place in every good collection.

Pears.

John Williams, Esq. sent specimens of a Seedling Pear, the produce of a standard tree raised in his garden at Pitmaston, from the Beurré du Roi, impregnated with the pollen of the Catharine. It has taken the external character of the Beurré, though it is not quite so large; the flesh is perfectly melting, and buttery, with the remarkable aroma which

distinguishes the Catharine. It has been named the *Catharine Beurré Pear.*

Mr. WILLIAMS also sent another Seedling Pear, the produce of a standard tree, raised from the Swan's Egg, impregnated with the pollen of Gansell's Bergamot. It is not larger than a fine Swan's Egg, but resembles the Gansell both in form and colour. The flesh is yellowish, melting, and rich, with a very agreeable perfume. It has been named the *Bergamot Swan's Egg.*

Mr. JOSEPH KIRKE sent specimens of a Pear, the produce of a graft received in 1816, from Dr. VAN MONS, with the number 67, instead of a name, and from the irregularity which has taken place in the nomenclature of Dr. VAN MONS's Pears there is little reason to expect that we shall be able to ascertain what its true name may be, it has therefore received that of *Van Mons.* In size and shape it resembles the Blanquette. The skin is yellow, with a little russet round the eye and stalk; the whole sprinkled with minute brown spots. The flesh is tender, juicy, and very pleasant. The tree bears well as a standard.

Specimens of the *Bezy Vaet Pear* were exhibited, sent from the garden of Lord HENRY FITZGERALD, at Boyle Farm, Thames Ditton. This is one of the numerous New Flemish varieties which have been introduced into this country, the general cultivation of which will add materially to our stock of Winter Pears. The Bezy Vaet resembles a very large Swan's Egg, both in form and colour, but the skin is smoother. The flesh is yellowish, perfectly melting, with abundance of rich sweet juice, and most agreeably perfumed. The present specimens were grown on a wall, but M. PARMENTIER

states, that in Flanders it bears freely as a standard, and that the fruit keeps till March and April. It is a great acquisition to our gardens.

Mr. Kirke exhibited specimens of the Pear called the *Colmar Epineuse*. This is another of the New Flemish Pears, it is a free bearer as a standard, though the fruit does not attain to a large size. It is of the Colmar form, though rather more pointed at the insertion of the stalk. The skin is a greenish yellow, much covered with russet; flesh yellowish, melting, very juicy, sweet, and extremely rich; it keeps well till December and January, and probably still later.

Mr. Kirke also sent specimens of the *Délices Hardenpont*, another New Flemish Seedling. This variety requires a wall to bring it to perfection, but to which its excellence well entitles it. Mr. Kirke's specimens were small, being from a standard tree, but when grown under favourable circumstances, it attains to three or four inches in length, and two or three inches in breadth. The skin is bright yellow, intermixed with green, and sprinkled with many green spots; the flesh is very white, melting, juicy, and sweet, but with very little perfume; it ripens in November and December.

Apples.

Mr. Hugh Ronalds sent to the Meeting, on the 17th of August, specimens of the *Early Julien Apple*, a very superior summer variety, of Scotch origin. It is rather larger than the Golden Pippin, irregular in its shape, angular on the sides, the angles rising into very prominent ribs round the eye. The skin is pale yellow, or rather cream colour, smooth and glossy; flesh yellowish, firm, and crisp, with a fine brisk

juice. The tree is a free grower, is very fertile, and bears its fruit in clusters.

John Boys, Esq. sent from his garden at Margate, specimens of a Seedling Apple, the produce of a tree raised from the seed of the Nonpareil. It very much resembles the Nonpareil in size and shape, and even in colour, except that the yellow predominates over the green more than in the Nonpareil. The flesh is yellowish intermixed with green, juicy, rich, and high flavoured. It has been named the *Margate Nonpareil.* It will keep about six weeks in perfection, and is an excellent intermediate fruit between the Summer and the Winter Nonpareils; the original parent tree, which has only borne fruit three years, is a great bearer, a free grower, and clear of canker.

James Warre, Esq. sent to the Meeting on the 15th of October, specimens of a seedling Apple, raised from the Ribston Pippin, in the garden of Stephen Dowell, Esq. at Braygrove, Berkshire. In size and form it somewhat resembles the Ribston Pippin, but is more pointed at the head, and the eye is sunk in a more confined and deeper cavity. The stalk is short and deeply inserted; the ground colour of the skin is green, but is nearly covered with a clear thin russet, and on the exposed side there is a slight tinge of brownish red; the flesh is rather of a finer texture than that of the Ribston Pippin, but in colour and flavour closely resembles it. It has been named *Dowell's Pippin.*

At the same Meeting, specimens of a seedling Apple were received from Mr. John Barnard, of Waltham Abbey. The tree was raised by him from a seed of the Golden Noble Apple, to which the seedling bears a strong resemblance, but

is much larger. It is nearly globular, some few of the specimens tapering a little towards the eye, which is large and open, seated in an even shallow basin; the stalk is short, deeply inserted; the skin is pale yellow, becoming deeper as the fruit ripens; some of the specimens take a tinge of dull scarlet next the sun; the whole surface is sprinkled with minute greenish spots, and a patch of coarse russet always surrounds the stalk; the flesh is yellowish, soft, juicy, and very sweet; it melts perfectly in baking, taking a clear pale amber colour, and retains a high flavour; the fruit keeps well till January. The tree is eleven years old, and began bearing in 1819. It is a free grower, and bears abundantly. It has been named the *Waltham Abbey Seedling*.

Mr. William Pleasance sent to the Meeting on the 20th of November, specimens of the *New Rock Pippin*, a seedling, raised in his Nursery at Barnwell, near Cambridge. It is of the Nonpareil kind, but less regular in shape than the Nonpareil, and the eye is sunk a little deeper. The stalk is short, the skin is of a dull green on the shaded side; on the part exposed to the sun it becomes brown, with a slight tinge of red, and the whole surface is sprinkled with russet. The flesh is yellow, firm, not very juicy, but rich and sweet, with a fine anise perfume. It keeps well till late in the spring, and is then hardly surpassed by any of the old varieties.

John Braddick, Esq. sent to the Meeting on the 19th of February, specimens of the *Claygate Pearmain*, an Apple of excellent quality. Mr. Braddick found the tree growing in a hedge at Claygate, a hamlet, in the parish of Thames Ditton, and introduced grafts of it into his garden. The

habit of the tree is spreading and drooping; it is not a strong grower, but bears freely, and has remarkably clean wood. The fruit is large and handsome, resembling the Royal Pearmain, and keeps well till March and April.

The Earl of Egremont sent to the Meeting on the 19th of March specimens of a seedling Apple, raised in the gardens at Petworth, and consequently called the *Petworth Nonpareil.* It bears a close resemblance to the Green Nonpareil both in form and colour. The flesh is green, of a crisp texture, very juicy, and possesses the flavour peculiar to the Nonpareil. The tree is a free grower, and abundant bearer; the fruit keeps well till late in the Spring.

XXXII. *Observations on the* Flat Peach of China. *In a Letter to the Secretary. By* Thomas Andrew Knight, *Esq. F. R. S. &c. President.*

Read January 7, 1823.

My Dear Sir,

I received from you, in the summer of 1820, some buds of a variety of Peach, which the Horticultural Society had imported from China, as the well-known *Flat Peach,* and which you supposed to be the same as the fruit of which a figure is given in the *Horticultural Transactions*;* though that was said to have been imported under the name of the Java Peach. In the last summer I obtained fruit from the buds I received from you, which was perfectly similar to that delineated in the *Transactions;* and part of which I should have sent to the Society, but that the whole of it was spoiled by cold and wet weather, which suddenly occurred after the lights had been (injudiciously in this climate) taken off. I can therefore speak only of the habits of the tree, which are very singular; and which, I think, will render it a valuable acquisition in our gardens. It appears to possess more than ordinary hardiness, with a degree of excitability far exceeding any which can be, even temporarily, given to any other known variety of Peach. In the last year its blossoms unfolded in January, though my Peach-house had till that period remained wholly open; and they set very freely

* Volume IV. page 512, Pl. 19.

under the protection of a mat only, without any fire having been used. In the last summer the wood became better and earlier ripened; and the blossoms, in consequence, opened early in November, before the lights were replaced upon the house. Fires, just sufficient to exclude actual frost, have since been occasionally made, and the fruit, under this mode of treatment, has already acquired the size of large Peas. Much of the foliage of the last year still retains its place, in health, and apparently in office. Of the future merits of the fruit, I am of course ignorant; but I believe, that with the advantages of a curvilinear roof, with good glass, and the branches trained close to it, well flavoured fruit might be obtained from trees growing in pots, in April.

The ability of trees to ripen crops of fruit is to a great extent regulated by the quantity of light, which falls upon their foliage. The same Pine-Apple Plant, which in summer will feed and ripen a fruit of a given weight, and during the same period generate the sap requisite to produce and feed several strong scions, will not in winter, though kept in as high temperature, be able to feed properly its fruit alone; and the powers of every fruit-bearing plant are governed by similar laws. A very abundant crop of good fruit must not therefore be expected from a Peach tree, which flowers in autumn.

I have found excitability of habit to be hereditary in the seedling offspring of plants, and to be transferable by the pollen; and therefore I imagine that there will be no difficulty in obtaining from the Flat Peach other varieties of similar habits free from the deformity, which has recommended it to the Chinese; but which cannot continue to

gratify the more reasonable taste of the British Horticulturist.

The nurserymen will, I believe, find some difficulty in propagating the Flat Peach by their ordinary mode of culture; for the buds, owing to their great excitability, will generally be found to break and vegetate very soon after being inserted, and consequently to perish in the following winter. But I have succeeded perfectly, by inserting the buds in young Peach stocks of the same season, in September and October, and even in the early part of November. Such stocks do not, however, in the cool climate of this place, usually acquire sufficient maturity of wood to enable them to bear very severe frost, and therefore it is my custom always to remove them into pots and place them under shelter early in the autumn.

I remain, my dear Sir,
your's sincerely,
THOMAS ANDREW KNIGHT.

Downton, January 3, 1823.

P. S. Since the foregoing observations were written, I have received a letter from Mr. WILBRAHAM, from which I have had the pleasure to learn, that the Chinese Flat Peach has exhibited perfectly the same habits in his possession, as in mine.

XXXIII. *On the Cultivation of* Mesembryanthemums. *In a Letter to the Secretary. By Mr.* William Mowbray, Gardener to the Earl of Mount Norris, *F. H. S., &c.*

Read December 3, 1822.

Sir,

I send, as you desired, an account of my method of managing *Mesembryanthemums,* the different sorts of which, when planted out of pots contiguous to each other, have a most beautiful effect, and are admired by every observer. The bed I used for this purpose was made in a pit which runs along the front wall of one of the hot-houses at Arley Hall, and is composed of good rich garden mould, mixed with a fair portion of fresh loam. In the spring of 1821, I planted out as many plants as filled three lights, putting nine or ten under each light of different sorts, such as, *inclaudens, aurantium, perfoliatum, deltoides, barbatum,* and other species of different habits; the strong growing kinds were put towards the back, and the dwarf ones in the front. They soon grew very vigorously, and flowered exceedingly well, having a very different appearance from that they exhibit when confined to small pots; many of them continued in blossom all winter, and until the spring, when I gave them a good thinning, for they were spreading over each other, and mixing together. At that time I planted the remainder of the pit, which is forty feet long and four feet wide in the clear, I also covered the surface with stones of different sorts, which were laid

irregularly so as to resemble rock-work: the stones had the effect of keeping the branches from the soil, which might otherwise decay them. The whole have done well, many still continue flowering, and are likely to do so through the winter. Nothing can surpass the brilliancy of the blossoms on a bright day in summer.

In winter the whole must be covered with lights, and occasionally with mats, as pits in front of houses usually are, but these are not necessary in summer, as the plants must be fully exposed to the free air, the same as hardy green-house plants, and require little more than thinning and plenty of water. Pits in front of stoves must be preferred, as the warmth from the front wall in winter will repel damps, and with a little covering above the glass, will sufficiently keep out the severest frost.

I was induced to attempt the above mode from observing that Ice plants grow to perfection on small hillocks of rich mould, supported by stones put together in imitation of rock-work, two or three feet high, with a base of about four feet diameter; these banks look well when the plants cover them entirely. I have cultivated Ice plants in this manner with success, every year since I have been at Arley Hall.

I am, Sir, your obedient servant,

WILLIAM MOWBRAY.

Arley Hall, near Bewdley,
November 30, 1822.

XXXIV. *On the Cultivation of the* English Cranberry, *(Oxycoccus palustris,) in dry Beds. In a Letter to the Secretary.* By Mr. Thomas Milne, *F. H. S.*

Read January 21, 1823.

Sir,

The sample of *English Cranberries* which I had the honour of sending to the Horticultural Society on the 2d of September last, were gathered from cultivated plants growing on a bed made in the same way, in every respect, as for Rhododendrons, Azalias, Andromedas, and other plants, generally denominated American. The soil was brought from Wimbledon Common, and was of that kind known by the name of black heath-mould, or peat, with a considerable quantity of white sand amongst it. The sand I however do not consider very essential to the growth of the Oxycoccus palustris, and if we may judge from the soils on which it grows naturally, it would perhaps be as well, or better, without it. The plants were put into the bed in the spring, at about one foot from each other every way, but I believe they would grow equally well, if planted at almost any other time of the year, except during the hot summer months, when there would be a greater risk of losing some of them, unless occasionally shaded and judiciously watered. As their slender shoots advanced, they were constantly laid into the ground about two or three inches deep, in order that they might the more certainly root, and be less influenced by the heat and dry

weather in summer. This I consider of much importance, and am of opinion that it is in a great degree owing to that circumstance that the plants have been so little affected by the extreme heat of the last summer. In two years the plants completely covered the bed, and last year (the third) they produced a crop of fruit which you had an opportunity of seeing. You then expressed an opinion that it might be desirable for the Horticultural Society to know the method of cultivating the English Cranberry so successfully on dry beds. But as the greater part of that season, 1821, was singularly wet and cold, I was led to suppose that circumstance might have been the cause of their then making such vigorous shoots, and I therefore thought it better to suspend my opinion concerning them till I saw what effect a drier season would have on both the plants and fruit. The last, one of the hottest and driest I ever remember, afforded me the opportunity I wished for, and I have had the satisfaction to observe that the plants have continued nearly as vigorous, and the fruit has ripened as well as in 1821, though a month earlier. As the produce was gathered at different times, to gratify the curiosity of ladies and gentlemen who visited our grounds in the course of the season, I cannot say exactly the quantity of fruit produced on a given space, but I think it was certainly not less than one quart on a bed five feet square, and I have no doubt, that, when the plants are more disposed by age to produce flowers and less vigorous shoots, the same space will yield a much greater crop. Some part of the bed is a little shaded by low pales, but how far that is a benefit to the plants, I do not pretend to say; last summer it became necessary to water all the American plants, and the Cranberry bed had an equal share with

the rest, but not greater; in 1821 no artificial watering was necessary. The subsoil over which the bed is made is a sandy gravel, therefore not retentive of moisture, which is against the successful cultivation of this plant on dry beds; but where the soil is naturally moist or damp, with a free air, advantage might be taken of it, and the English Cranberry might be cultivated on it with much success. On a bed in a similar situation, and of the same sort of soil, the American Cranberry, (Oxycoccu Macrocarpus) grows most luxuriantly, but as a valuable paper on the cultivation of that species has been published in the *Transactions of the Horticultural Society* by Mr. HALLET,* I consider it unnecessary to add any thing to his directions and observations, which are plain, and if followed, will be attended with success.

I have been long convinced that both species may be grown with much advantage in numberless situations in this island, and have been surprised that cottagers and others living on or in the neighbourhood of moors and heaths, covered with soil suitable for their growth, have not been advised to cultivate them for the sake of profit. According to WITHERING's quotation from LIGHTFOOT,† twenty or thirty pounds worth of the berries are sold by the poor people each market day for five or six weeks together, in the town of Langtown, on the borders of Cumberland This is a considerable sum for berries picked up from barren wastes and in a district so thinly inhabited, and it is remarkable that the ready sale for them has not tempted some person to make the trial to supply the market in a more certain and

* Horticultural Transactions, Vol. IV. page 483.

† Withering's Syst. Arr. of British Plants, 5th Edition, vol. II. page 462.

regular way: if they could not be consumed or disposed of in the immediate neighbourhood, where they may be grown, they could easily be sent a great distance without the hazard of being spoiled. There is one very strong argument in favour of their cultivation, which is, that they may be made to grow with little trouble in places and on soils where few other useful plants yet known will grow to advantage. It may be said that the demand for them will be limited and uncertain; but that may have been said of a number of other things of a similar nature which now meet with a regular sale, and which the growers of course endeavour to cultivate according to the demand they have for them. If to supply the whole of Great Britain, only the produce of one hundred acres were required, it would at least be one step towards making that quantity of waste land useful in some degree, and probably suggest some other improvement in various ways. Should any person be induced to make the trial, there can be no doubt the American Cranberry would be the easiest managed, and most productive for general use; but as many prefer the flavour of the English Cranberry, there would also be a demand for it on that account, though at a higher price.

I am, Sir,

Your obedient Servant,

THOMAS MILNE.

Fulham, December 10*th*, 1822.

XXXV. *On the Management of* Cauliflower Plants, *to secure good Produce during the Winter. In a Letter to* William Stephen Poyntz, *Esq. F. H. S. By Mr.* George Cockburn, *Gardener to Mr.* Poyntz. *Communicated by Mr.* Poyntz.

Read February 4, 1823.

Sir,

I have the honour to send you herewith a head of *Cauliflower*, which I shall be happy to have laid before the Horticultural Society, as I believe it has seldom been exceeded in size and beauty at this season of the year; and at the same time, I trouble you with a brief account of my mode of cultivation, which, if you think proper, may accompany it.

I sow the seeds of the Early Cauliflower in a south border, in the beginning of July, and as soon as the plants come up, I thin them out to twelve or fourteen inches apart, where I suffer them to remain, keeping them clean, and watering them occasionally, till about the middle of November, by which time they all produce heads from ten to thirty inches in circumference. As they are not hardy enough to bear more than three or four degrees of frost, I remove them at that time into a shed which will keep out ten degrees of frost, taking care to retain as much mould about their roots as possible, and to remove all their decayed leaves. In the shed they are planted in mould, keeping a space of about an inch between each head. In this state they are frequently looked over with care, their dead leaves removed, and those

heads cut for present use which shew any disposition to decay. When severe frost occurs, the plants are covered with dry short hay. By this management I have been able to send three dishes of Cauliflowers to the table every week during the autumn and winter, till the present time, and shall be able to continue to do so until February.

I am, Sir,

Your most obedient Servant,

Cowdray Lodge, Sussex,
13th January, 1823.

GEORGE COCKBURN.

Note by the Secretary.

The head of Cauliflower above alluded to, was sent to the house of the Society the day after the Meeting of the 14th of January. It was nearly thirty inches in circumference, very compact, and of good colour. It boiled tender, and was of excellent flavour.

XXXVI. *On the Cultivation of the* Tetragonia expansa. *In a Letter to the Secretary. By the Rev.* JOHN BRANSBY, *A. M. F. H. S.*

Read March 4, 1823.

DEAR SIR,

I HAVE sent you, as I promised, some seed of the *Tetragonia expansa.* I find that the best method of cultivating it, is to put the seeds singly into garden pots, and to raise them in the Cucumber or Melon frame, as other tender annuals are raised, and at the latter end of May, or beginning of June, when the weather is sufficiently settled, to allow the putting out ridge Cucumbers, to plant them out at least five or six feet asunder, in the places they are to occupy during the summer.

For the reception of each plant I take out earth enough to admit a barrow-full of rich rotten dung, and covering it a few inches with mould, turn the plant out of the pot into the centre; by the settling of the dung a sort of basin will be formed, very beneficial for receiving and retaining moisture so essential to luxuriant growth. When the plants begin to grow and expand themselves, the ground under and about them should be covered half an inch thick with sand or road-drift, which will keep the plants dry, will enable the gardener to free them from grass and weeds, as well as to pick off the leaves in a better state; it will be particularly useful also in preserving the seed, which becoming ripe in the axils of the older leaves of the plant, falls off during the

summer, and may, from the difference of colour, be easily discerned and collected, when the plants are cleared away; whereas, without this precaution, the seed being so nearly of a colour with garden mould, it is very difficult to distinguish it, and it then requires much patience and good eyes to preserve even a small portion. If the preservation of seed be a considerable object, as soon as the plants are rendered useless for the kitchen by the frost, each branch should be cut off from the main stem, and hung up singly in some dry place, where the seed may be collected as it falls off. If any additional testimony were wanted to the excellence of this culinary vegetable, I might add an extract of a letter from a friend in Hampshire, who writes, "I must express my thanks to you for your valuable present of the Tetragonia, which has supplied my table and that of two of my neighbours, from June till the frost destroyed it, and all from three seeds."

I am, dear Sir,

Your obliged humble servant,

JOHN BRANSBY.

Stoke Newington,
February 28, 1823.

XXXVII. *On a* Method of Securing the Scion when fitted to the Stock *in Grafting. In a Letter to* Charles Holford, *Esq. F. H. S. By* David Powell, *Esq. Communicated by Mr.* Holford.

Read January 21, 1823.

My dear Sir,

Having for the last three seasons found great convenience in a method of *securing the scion* in grafting, which I believe has not hitherto been much practised; and knowing the interest you take in any thing that relates to the garden, I beg the favour of you (if on perusal you think it worthy of attention) to communicate this account of it to the Horticultural Society.

It is simply this:—grafting-wax properly prepared, when in a melted state, is spread evenly on sheets of moderately thin brown paper, which, when cold, is cut into slips about three-quarters of an inch wide.

When one of these slips is to be used, warm it with the breath, and bind it round the stock and scion, pressing it gently with the hand, when it will be found to adhere so closely as totally to exclude both air and moisture. No further trouble is necessary, though it may be as well to look over the grafts occasionally, pressing the paper close with the hand, where it may have before been missed; but after a few days exposure to the warmth of the sun, it will generally be found adhering so closely as to want no further attention. I have usually secured the whole by a small band of bass,

but in several instances have found the strength of the paper sufficient to sustain the scion in its place. With the advantage of avoiding any unequal pressure of the bark, the neatness and convenience of this method will, I doubt not, recommend it to the practice of Amateurs, and I have equal confidence that its cheapness and utility will secure it a favourable reception with Practical Gardeners.

I shall be much gratified to find my communication thought useful; and be indebted to you for the chance of rendering it more known.

I remain,

dear Sir, your's truly,

DAVID POWELL.

Loughton, Essex,
13*th January,* 1823.

POSTSCRIPT.

The grafting-wax is recommended by MILLER, and also in the several *Cyclopædias,* under the head of Grafting, as composed of the following materials, with trifling variations as to proportion. I have used,

1lb. of pitch
1lb. of resin
½lb. of bees-wax
¼lb. of hogs-lard
¼lb. of turpentine,

melted, and well mixed together. By placing the composition in an earthen pan over boiling water it may be kept in such a state of fluidity as to be easily spread on the paper

with a brush; heated in this manner, the wax appears to retain its pliability better than when exposed more immediately to the action of fire.

I have the pleasure to hear from a Practical Gardener who tried the above method last season, that he found it answer completely, except in an instance where he had been over sparing in material;—a hint, that the wax should be spread evenly on the paper, and not too thinly.

XXXVIII. *An Account of the Injurious Influence of the* Plum-Stock *upon the Moorpark Apricot. By* THOMAS ANDREW KNIGHT, *Esq. F. R. S. &c. President.*

Read April 1, 1823.

IN the selection of *Stocks* for the reception of grafts or buds, of different species of fruit-trees, the English gardeners, and nurserymen, generally suppose, that when a stock is employed upon which the inserted graft, or bud, will grow freely and permanently, every thing which is expedient, or beneficial, is done. It is even supposed that cases exist in which much advantage is obtained by the use of a stock of a different species, and even of a different genus. The Peach and Nectarine trees are thus generally believed to succeed better upon the Plum, than upon the native stock; and some varieties of the Pear have been pronounced by MILLER to acquire their highest state of perfection upon Quince stocks; but I suspect that MILLER formed his opinion rather upon the external colour, and size of the fruit, than upon its intrinsic qualities, and decided, as every gardener, who had honestly sent the best produce of his garden to his employer's table, would probably have done, that the sample of his fruit, which exhibited the finest colour, and the largest size, was the best, and it is well known that a young Pear tree, when growing upon a Quince stock, affords fruit of brighter colours, and in some varieties, of larger size; and

that the tree is rendered more governable, and therefore more productive, when trained to a wall. Taking off a circular ring of bark, or what is called ringing the stock, gives a similar increase of size to the fruit, and of brilliancy to its colour; but its pulp is rendered much less succulent and melting; and I suspect that the effects of a Quince stock, and of ringing, will be found very nearly similar, each operating to interrupt the free and proper course of the sap. Some varieties of Pears are known to be spoiled by the Quince stock; and I entertain little doubt, but that the quality of every species of fruit, to some extent, suffers when grown upon a stock of another species or genus.

I have been led to these conclusions by the following circumstances, which have within the last two years come under my observation. I have stated, in a former communication,* that the Moorpark Apricot succeeds much better upon its native stock, than upon a Plum-stock. I had observed that its foliage acquired a deeper shade of colour, and that it retained its verdure very considerably later in the autumn; and its fruit appeared to me to be singularly excellent. I had not, however, at that period, an Apricot tree growing upon a Plum-stock, upon quite the same aspect, and I therefore hesitated to ascribe the superiority of the fruit to any operation of the native stock. But I have subsequently planted two trees, growing upon Plum-stocks, and two upon Apricot-stocks, upon the same aspects, and in a similar soil, giving those upon the Plum-stocks the advantage of some superiority in age, and I have found the produce of the Apricot-stocks to be in every respect greatly the best.

* See Horticultural Transactions, Vol. ii. p. 20.

It is much more succulent and melting, and differs so widely from the fruit of the other trees, that I have heard many gardeners who were not acquainted with the circumstances under which the fruit was produced, contend against the identity of the variety. The buds were, however, taken from the same tree.

I have also some reasons for believing, that the quality of the fruit of the Peach-tree is, in some cases at least, much deteriorated by the operation of the Plum-stock. My garden contains two Peach trees of the same variety, the Acton Scott, one growing upon its native stock, and the other upon a Plum-stock, the soil being similar, and the aspect the same. That growing upon the Plum-stock affords fruit of a larger size, and its colour, where it is exposed to the sun, is much more red; but its pulp is more coarse, and its taste and flavour so inferior, that I should be much disposed to deny the identity of the variety, if I had not inserted the buds from which both sprang, with my own hand.

Having tried experiments only in one soil, and in the same situation, I, of course, have stated the foregoing circumstance chiefly with the view of exciting other Horticulturists to make similar experiments, and it is particularly desirable that such should be tried in the Garden of the Society.

I think it probable, that the quality of the Nectarine will be still more affected, its pulp being less succulent than that of the Peach, but I have not at present any facts worth adducing in support of this opinion.

One valid objection to the use of Peach-stocks must be admitted: trees budded upon them certainly cannot be transplanted with an equal certainty of success; and particu-

larly trained trees: but those I am very much disposed to call spoiled trees, which appear calculated to gratify the impatience of the planter, but which often ultimately disappoint his hopes. I have never found any difficulty in transplanting young budded Peach trees with perfect success.

The Peach stones, having been protected from severe frost through the winter, may be planted in drills, at about eight inches distant from each other, and a space of about two feet was left between the rows. The plants will spring up in April, and in August and September will be of proper age and size to be budded about two inches from the ground. The nurseryman therefore will have the advantage of taking his buds from the trees whilst the fruit is upon them, and he can in consequence easily guard against errors, which much too frequently occur; and he may be quite certain, that none of his buds will break prematurely. Buds may be inserted in the early part of October; and in the last autumn, I introduced some with perfect success in November. Late in the autumn, I generally shorten the roots of my young Peach-stocks, particularly those roots which descend perpendicularly into the soil, by introducing a spade into the ground on two sides of each plant, but without moving it, or further disturbing its roots. Thus managed the buds shoot very freely; and with proper attention to preserve their fibrous roots, and to pack them properly, they may, I am certain, be sent to the most distant parts of the island without danger of their being killed by their removal. Older trees possibly cannot be removed without danger of their failing; but I transplanted a Peach tree in the last autumn of ten years old, which grows upon its own roots, and was more than ten feet high; and it is

this spring emitting its blossoms as freely as those trees which have not been transplanted. Its roots were, however, well preserved, and its branches properly retrenched.

Peach and Nectarine trees, particularly of those varieties which have been recently obtained from seed, may be propagated readily by layers, either of the summer, or older wood; and even from cuttings without artificial heat; for such strike root freely. But the most eligible method appears to be that of sowing the stones, and budding the young plants in the same season; and I will venture to assert, that Peach and Nectarine trees may be thus raised with much less expense and trouble, than by the ordinary method of budding upon Plum-stocks; and that the rapidity of their growth will amply compensate for the small size at which it will be expedient to plant them. An opinion prevails amongst gardeners, that such trees will prove very short lived; in opposition to this, I have nothing further to say, than that I have plants of more than twelve years old, one of fourteen years old, which certainly show no disposition to die, nor any appearance of having grown old.

XXXIX. *An Account of some* Mule Plants. *By* THOMAS ANDREW KNIGHT, *Esq. F.R.S. &c. President.*

Read May 6, 1823.

THE excessive rarity of *Mule Plants,* in a perfectly wild state, (if in such they exist at all), and the facility with which they are, in many cases, obtained in the garden, seem to countenance the opinion, which is entertained by many botanists, that plants of different species do not readily breed with each other, till their natural habits have been broken and changed by the operation of culture through some successive generations. Vegetable mules are, however, never produced except under circumstances which rarely, if ever, occur in a perfectly natural state; for experiment has satisfied me, that not only the pollen of the alien species must be introduced at the proper period, but also, that the natural pollen must be kept away not only at that precise period, but generally, for several succeeding days afterwards: also, and even under the most favourable circumstances, I have never succeeded in obtaining mules, unless the plant or a considerable branch of a fruit tree, has been reduced to the necessity of nourishing mule offspring, or none. When the later blossoms on a fruit tree were suffered to remain, such branch either threw off the fruit which would have afforded mule plants, or the natural pollen was found to have been subsequently introduced by insects, or winds, and to have

annihilated the operation of that obtained from the plant of another species. Not improbably some erroneous conclusions may also have been drawn, owing to varieties of permanent habits, into which different species of plants have sported under the influence of different soils and climates in a perfectly natural state, having been mistaken for originally distinct species, for I perfectly agree with Mr. HERBERT,* in thinking, that the number of species of plants, which came immediately from the hand of nature, is probably much smaller than that now found in the catalogues of botanical writers: and it is also wholly impossible to distinguish such natural varieties from originally distinct species, by any peculiarities in their external character. In the present imperfect and limited state of our information, it is therefore, in many cases, difficult to decide whether plants are, or are not, mules, it being still questionable whether mere natural varieties, after they have, through successive generations, assumed very widely different forms and characters, are found to breed with each other as readily, as other varieties of the same species, of similar habits; and that real mule plants have in some instances, and under certain circumstances, produced offspring, (mules like themselves, I suspect), cannot, I believe, be questioned.

The principal object of the present communication is to describe two new kinds of mule plants, which have recently come within my observation. One of these presents the singularity of being, though certainly a mule, in some degree deserving the attention of the fruit-gardener; and the other affords me the means of pointing out a new species of fruit,

* Horticultural Transactions, Vol. iv. page 16.

in the Morello Cherry, to the improvement of which I wish particularly to invite the attention of the experimental gardener.

The results of many experiments upon the different kinds of Strawberries, which are cultivated in our gardens, led me, some years ago, to conclude that we possess three distinct species of that genus; the Wood or Alpine, the Scarlet in many states of variation, and the Hautbois. I failed to obtain mule plants between the Alpine and the Scarlet, and Hautbois, which I inferred to be of distinct species, because they did not, under favourable circumstances, breed at all with each other. But I have subsequently seen, in the possession of my friend, Mr. Williams, of Pitmaston, mule plants obtained from the seeds both of the Scarlet, and Hautbois, and the pollen of the Alpine Strawberry. One of these, which sprang from the seed of the Hautbois, presents in its foliage and habit the character of its female parent, without any perceptible variation. It blossoms very freely, and its blossoms set well; but the growth of the fruit subsequently remains very nearly stationary during the whole period in which the Hautbois Strawberry grows, and ripens; after which it swells and acquires maturity. It is then rich and high flavoured, but of less size than the Hautbois, and without seeds. Mr. Williams, however, informed me, that he had once obtained a single seed, which afforded a mule plant in every respect similar to its parent. I have sent a few plants of each kind to our garden, and I believe the varieties will be thought to deserve culture by those who are admirers of the flavour of the Hautbois, and wish to prolong its season. The plants in my garden afford a second blossom in autumn.

Not entertaining any doubt of the specific identity of the Morello and common Cherry, I made experiments upon a large scale, confidently anticipating the production of some very valuable new varieties; and I had in consequence not less than twenty trees, which afforded blossoms in the last season. Buds of many of these had been inserted into the bearing branches of old Cherry trees, which were trained to walls of different aspects; and blossoms, which were all apparently well organized and perfect, were every where abundantly produced, but very nearly all proved abortive. From a south wall I obtained five Cherries from nearly as many thousand blossoms, and four of these did not contain seeds. One variety was very large, and nearly similar in colour to its male parent, the Elton Cherry; but its colour was somewhat deeper. Its flesh was white and melting, with very abundant juice; but containing only a small portion of saccharine matter. The others were worthless, and all the plants are, I believe, unquestionably mules.

As a species of fruit I consider the Morello Cherry to present very strong claims to the attention of the Horticulturist. The hardiness of its blossoms, which I have found to be alike patient of heat and cold; the large size of the fruit, with its abundant juice, and power of retaining its soundness and perfection long after it has become mature; and the exuberant produce of the tree in situations where the common Cherry succeeds but ill, render it, with all its present imperfections most valuable: and there appears to be no reasonable ground for doubt, but that richer and possibly larger varieties of it may be generated by proper culture through a few successive generations. Should the fruit become rich, a

less exuberant produce must, however be expected; for sugar appears to be an article, the production of which requires a large expenditure of the vital juices of the tree.

We possess, I believe, in the Flemish and Kentish Cherry, two varieties of the same species with the Morello; and the Toussaint, and one or two others described by DUHAMEL in his *Traités des Arbres Fruitiers*, appear to belong to the same family. The Morello Cherry tree is obviously the "Cérisier très fertile" of this author.

I have seen the blossoms and fruit of the Morello Cherry tree bear, in the forcing-house, the temperature of seventy and even of eighty degrees, without any injurious or peculiar effects, except that the plumules of the seeds produced in such high temperature expanded with something very like blossoms upon the points. Small white leaves, in every respect similar to the petals of blossoms, were in many instances arranged as in a perfect blossom, which withered and died, whilst a bud upon the lower part of the stem vegetated, and the period of puberty in the plants did not subsequently appear to be at all accelerated by the operation of the high temperature in which the seeds had been ripened.

I do not offer plants of the Mule varieties above-mentioned of the Cherry, to the Society, because I feel quite confident of their being wholly useless.

XL. *On the* Woburn Perennial Kale, *a Variety of Brassica oleracea acephala fimbriata.* *By Mr.* George Sinclair, *Gardener to the* Duke *of* Bedford, *F. H. S. &c. &c.*

Read February 18, 1823.

In the very interesting paper of M. De Candolle, on the Species, Races, and Varieties of the Genus Brassica, there is no mention made of a singular and but little known subvariety of the Brassica oleracea acephala fimbriata, which I have called the *Woburn Perennial Kale,* and now propose to give some account of, to the Horticultural Society. The valuable properties of this plant, as a never-failing Winter-Green, deserve to be more generally known, for, excepting that some plants and cuttings have been distributed by the Duke of Bedford, in consequence of its having been cultivated in his Grace's gardens at Woburn Abbey, it certainly is almost unknown as an esculent vegetable. I have, however, lately learned that plants of a similar character, and nearly resembling it, are, occasionally, though rarely, grown in gardens in the County of Norfolk.

This variety of Brassica oleracea was first grown at Woburn Abbey in 1808, and until 1814, it was cultivated as an ornamental plant; the foliage being very finely divided or fringed, and of a deep purple colour, it was not considered unworthy of a place in the flower garden. For seven years it refused to flower, though cultivated in different ways, in

pots, in the open ground, and in the green-house. The original plant in 1817, had attained the height of seven feet when it flowered, but it did not then perfect any seed. Previous to this, it was found that every cutting or slip of the plant, when properly treated, struck root in the open ground as freely almost as seedling plants of the common varieties of Kale. On trial of its properties as an esculent it proved to be equal to the best Winter-Greens.

In 1815, a space in the kitchen-garden of one hundred and fifty square yards of ground was planted with cuttings of the Perennial Kale. This plantation has ever since afforded an abundant crop annually of Winter-Greens, without the aid of manure, or any other labour, except that of keeping the ground free from weeds.

The produce on an average is quadruple that of the annual varieties of Winter-Greens, as the following comparative statement will shew.

Perennial Kale, on 10 square yards produced	144lb. 10 oz.
Green Borecole, on 10 square yards produced	28lb. 3 oz.
Purple Borecole, on 10 square yards produced	30lb. 1 oz.

It may be remarked that the plants of the Perennial Kale, which afforded the above produce, were of eight years standing in the soil without manure. The Green Borecole, and the Purple Borecole had the soil well manured previous to their being planted. All the plants in the above trials were cut to within three inches of the ground, and the stems were included in the weight stated, as being the complete produce of each variety in one season. These results being obtained under the same circumstances as to soil, situation,

and season, are therefore conclusive of the superiority of produce.

That the nutritive powers of these varieties are nearly alike, the following details of the result of several trials made with much care will afford proof.

	Nutritive Matter.	Woody Fibre.	Water.
1750 grs. of the Perennial Kale afforded	109 grs.	233 grs.	1408 grs.
1750 grs. of Green Borecole afforded	110 grs.	220 grs.	1420 grs.
1750 grs. of Purple Borecole afforded	112 grs.	280 grs.	1358 grs.

The above trials were all made on the tops and sprouts of the plants used for the table, and in all other respects were under the same circumstances.

The following mode of cultivation of the Woburn Perennial Kale, I have found perfectly successful:—about the beginning of April, or as soon as the crop of Winter-Greens is completely out of season, the stems are cut down near to the ground, within two buds of the roots, the soil is then pointed, or slightly forked over, and afterwards kept clear of weeds by the hoe; this is all that is required for a plantation already made. To form a new plantation, the stems cut off in the March or April dressing, reduced to lengths of six or seven inches, answer very well for cuttings to strike root, though the lateral shoots, or those with crowns, make the strongest plants; the first year after that, however, all distinction is lost. These cuttings may either be planted immediately in the places where they are to stand permanently, in rows of from twenty to twenty-four inches apart, applying water when required, until they are firmly rooted, or in a bed of rich light earth, at from three

to four inches apart, to be afterwards transplanted when well rooted, to where they are intended to remain. The cuttings should be inserted into the ground three parts of their length. A soil intermediate as to moisture and dryness suits them best. Like most of the Brassicæ, this Kale requires a rich soil, particularly for the first season; it thrives however on clays, as well as on sandy soils, but the weight of produce on such, is proportionably less.

From defective structure in the essential parts of its blossoms, this Perennial Kale perfects little seed; but as it propagates so freely by cuttings, the want of seed is scarcely felt in its culture; and indeed as it is subject to sport much when raised from seed, it seems essential to the preservation of the particular variety, that it should be increased by cuttings.

Having obtained about two ounces of the seed from plants, grown in a situation remote from any other cabbage, and even from any cruciferous plant, it was sown. The plants raised from it have exhibited ten distinct varieties, they are now three years old; of these, there is only one that perfectly agrees in all points with the parent stock; the rest are different in the colour and form of the leaves. Specimens of the leaves of these have been prepared, and sent for the inspection of the Horticultural Society. The plant which is farthest removed from the original, has the leaves smooth, fleshy, nearly entire, and in colour and substance precisely resembling the young leaves, or those emitted by the stems, of the Early York and Imperial Cabbages; from this, through nine others, the colour, form, incisions, and

substance of the leaves regularly approximate until all distinction is lost in the original plant.

The very superior annual produce of the Woburn Perennial Kale, the saving of manure, as well as of labonr in its culture, its hardy nature (always insuring a crop of excellent Winter-Greens,) are properties which recommend it to a place in every kitchen-garden, more especially in those of farm-houses and cottages.

XLI. *On the* Cultivation *of* Horse Radish. *In a Letter to the Secretary. By Mr.* Daniel Judd, *F. H. S.*

Read March 18, 1823.

Sir,

As you have requested me to give you an account of my plan of growing the *Horse Radish* (of which you have seen specimens), I shall endeavour to state it to you as clearly as possible, but it is so simple, that I fear you will hardly think it worthy of notice.

The first thing to be provided is a proper spot for the bed; it too often happens that Horse Radish, as well as many other herbs, is injudiciously placed in some corner of the garden, out of sight, without any attention being paid to the natural habit, or proper treatment of the plant. Although I do not mean to advance that it is necessary to give the first place in the garden to such things, yet it is very desirable that they should have proper situations. The Horse Radish in particular should have an open spot of ground, and it requires some little trouble to bring it to perfection.

After having fixed on a spot of the garden sufficient for the crop I intend to plant, it is trenched two good spades (I ought rather to say two feet) deep, either with or without manure, according to the state of the soil, which, if in itself good, requires no enriching; but if it is poor, some good light manure ought to be added to it, and this must be carefully laid into the bottom of each trench, for, if not so done,

the Horse Radish, which always puts out some side roots, would send out such large shoots from the main root in search of the dung contiguous to its sides as to materially deteriorate the crop.

After the bed is thus prepared, plants are procured by taking about three inches in length of the top part of each stick, and then cutting clean off about a quarter of an inch of this piece under the crown, so as to leave no appearance of a green bud. Holes are then made in the bed, eighteen inches apart* every way, and sixteen or eighteen inches deep; the root-cuttings, prepared as directed, are let down to the bottom of the holes, which are afterwards filled up with fine sifted cinder-dust, and the surface of the bed is raked over as is usual with other crops; it will be some time before the plants appear, and the operation of weeding must be done with the hand, and not with the hoe, till the crop can be fairly seen; afterwards nothing more is requisite, beyond the usual work of keeping clean, till the taking up of the crop, and this may be done at any time during the winter months.

My time of planting is between the middle of February and the middle of March; I always find that the stouter the cutting the better will be the produce; no make-shift roots will do well, neither can careless planting be allowed; if due attention to these essential points is not given, I cannot promise a good crop.

* The distance at which I have always planted my Horse Radish has been eighteen inches every way, but I think, on very good land, that the rows should be two feet, and the plants eighteen inches in the rows apart; in some soils the plants grow more to leaf than in others, consequently, they should in such situations have more room allowed for their growth.

The instrument used for making the holes is like a potatoe-dibber, about an inch and a half in diameter near the point, and two inches and a half at the upper part, so that the top of the hole it makes is larger than the bottom.

I remain,

your obliged humble servant,

DANIEL JUDD.

Edmonton,
March 17, 1823.

XLII. *On a Method of* Cultivating *the* Mushroom. *In a Letter to the Secretary. By Mr.* William Hogan, *Gardener to* James Warre, *Esq. F. H. S.*

Read January 21, 1823.

Sir,

Having devised an easy mode of *growing Mushrooms* under shelter, which I have practised this season with much success, I am instructed by my master to transmit you an account of it. I have a peculiar pleasure in complying with his directions, for it will be always very agreeable to me to communicate to the Horticultural Society of London any matter in the way of my profession, tending to promote the objects of that institution.

The exterior form of my bed resembles the old ones as built against a wall, but instead of building it solid, it is hollow; strong stakes are inclined against the wall at an angle of about sixty-five degrees, on which are placed hurdles to support the bed. By this means a cavity is formed under the stakes, between them and the wall and floor, for the purpose of receiving dung, which being readily changed, an opportunity is thus afforded of keeping up a permanent moist bottom heat in the bed, the absence of which, together with an insufficient depth of mould for the spawn to run in, is the great defect of all other modes of raising Mushrooms with which I am acquainted.

Upon a structure thus contrived, I built two beds, eighteen inches thick, the uppermost four inches of which is mould of

a loamy nature, with an admixture of one quarter of road sand. The substratum was formed of dung, which had laid in the stable yard a considerable time; this was well shaken, and laid in ridges for about a week, giving it a few turnings in the interim, by which time it became moderately dry; I then added to it one-third of mould collected under a group of common Horse-Chesnut trees, where different cattle indiscriminately retreat during the heat of summer; this lay in heaps a few weeks previous to use. A layer of straw or long litter was first placed on the hurdles, to prevent the mould and short part of the dung passing through them. In laying on this compost, I beat it with a spade till it became solid, and then left it for a week, before it was spawned and moulded. When the mould was put on, I bestowed no other labour on that, than beating it with the spade.

I did not use a covering of straw or hay, nor do I think it necessary, provided the place where the beds are built be sufficiently closed; but in an open shed such a protection must be provided.* With respect to watering, it would be difficult to lay down fixed rules, that must depend on the judgment of the gardener; however, from the depth of mould which is used in this plan, I can confidently state, that there is no necessity of being so sparing of water as is usually recommended by writers on the subject.

The beds which I made as above described, were spawned on the 24th of August last; they came into bearing on the 21st of the following month, and would have continued bearing up to the present time without ceasing, and for

* When a covering is not used, the whole crop fit for use may be observed at once, which is very advantageous.

several weeks longer, if an unfortunate accident had not occurred on the night of the 28th of last month, (December), by a fracture in the ceiling of the room, which admitted the frost.

Notwithstanding this accident, however, I propose, after giving the bed a few weeks' rest, to renew the linings, and I have the most sanguine hopes that my labour will be successful; for, upon a close examination, I find that the whole mass of dung and mould is completely full of spawn.

The place in which the beds are placed is a dark room, about ten feet square, exposed to the north, and with an earth floor. They are each about eight feet six inches long, and measure seven feet over their surfaces from the floor to the wall.

Of the produce of those beds my master and many gentlemen in the neighbourhood, as well as their gardeners, can bear ample testimony. The appearance of the Mushrooms was singularly beautiful. In their growth they formed an apparently powdery substance resembling the Aphis Lanigera in its young state, and this progressively altered till it became more crustaceous and solid, ultimately forming large clusters of from *one hundred* to *two hundred* Mushrooms. One of those clusters, taken as a fair sample, was exhibited to you by my master some time back, and from it you might have formed a judgment of the general size and quality of the produce of the whole bed.

I have the honour to be,

Sir,

your most obedient humble servant,

WILLIAM HOGAN.

Randall's Park, near Leatherhead,
5th January, 1823.

Note by the Secretary.

The cluster of Mushrooms alluded to was brought to the Society's House in Regent Street, on the 6th of November last; they were unusually fine in appearance, and some when dressed proved very excellent. The abundance of the produce so clustered together, was certainly very unusual.

Mr. Warre, in a letter communicated after Mr. Hogan's Paper was sent to the Society, observed, that the frost had not been so injurious to the bed as had been apprehended, for that it continued to produce Mushrooms, though not in such great quantities as before the accident; but this diminution of produce Mr. Warre attributed, in part, to the dung not having been changed, so that the bed was not sufficiently heated.

Mr. Warre further mentioned that the produce altogether had been very great, for though dressed in every way possible, besides furnishing a frequent supply to neighbours, the beds more than once had yielded a gathering of a bushel of Mushrooms for Catsup. The Mushrooms were thick-fleshed, firm, and high-flavoured, on their upper surface they varied in colour from a fine brown to white, but were invariably of a light Peach-bloom colour underneath. The clusters consisted chiefly of great numbers, and when they did not grow in clusters, single round Mushrooms were produced.

Mr. Samuel Sawyer, Gardener to Isaac Lyon Goldsmid, Esq. of Camberwell, having seen the Mushroom beds formed by Mr. Hogan, and described above, has, in a communication made to the Secretary of the Society, and read at the Meeting

on the 18th of March, 1823, suggested that instead of forming the bed upon stakes and hurdles, a sort of frame work might be used, which he proposes, should be constructed with bent iron rods one inch and a half in circumference, and placed six inches apart, each end being let into bars, one to be fixed on the floor, the other against the wall, the whole forming an half-arch, the radius of which might be from two to three feet according to the space required underneath the bed; the bed to be made over the whole surface of the iron-work, and the dung to be put in under it. The bars might be covered with wove iron lattice work, the meshes of which should be so small as to prevent the substances, used in making the bed, falling into the cavity, and mixing with the hot dung.

XLIII *On the* Fertilization of the Female Blossoms of Filberts. *In a Letter to the Secretary. By the Rev.* George Swayne, *C. M. H. S.*

Read February 18, 1823.

Dear Sir,

We have it recorded, as an undoubted fact, in the Annals of Botany,* that the flowers of a male Palm tree† (Palma major foliis flabelliformibus), which were carried from Leipsic to Berlin, a distance of twenty miles, and there suspended over the branches of a female tree of the same species, caused the latter to yield, in the first year of the experiment, above one hundred ripe fruit, and, on repeating it the second year, two thousand, though the tree had for thirty years preceding regularly blossomed without ever perfecting fruit. There is some reason to believe, that by a similar operation, with

* See Philosophical Transactions for the year 1751. Vol. xlvii. page 169.

† The name of "Palma major foliis flabelliformibus," as given in the paper of the *Philosophical Transactions* referred to, is not to be found in any of the works extant at the time, which treat on plants, and a difficulty has in consequence arisen in ascertaining the particular species of Palm which was the subject of the experiment. Linnæus, in his Disquisition de Sexu plantarum, (*Amoen. Acad.* Vol. x. p. 125.) adverting to the fact, states the plant to have been Phœnix dactylifera, the Date Palm, and mentions his having young plants in his own garden at Upsal, raised from the *Dates* produced by the experiment. Sir James Smith, however, in a note to his *Introduction to Botany*, (3rd edition, page 245), conjectures it to have been Rhaphis flabelliformis, from the use of the terms "foliis flabelliformibus" in the original paper.

the male flowers of the wild Hazel, from the neighbouring lanes and hedges, in most cases within the distance of a single English mile, the Filbert trees in our gardens and orchards may be made to produce much more fruit than they commonly do.

When I first came to reside at Dyrham, (which was in the year 1806), I found two young Filbert plants, about three or four years old (from suckers) or probably more, growing in a situation which I did not approve of, and caused them to be removed and planted in a corner of a small garden, on a ditch bank which parted my neighbour's premises from mine. Here they were suffered to grow in their own way, with no cultivation, and scarcely any attention bestowed on them. As after many years they had borne none, or but little fruit, so little or none seemed to be expected from them; but casually passing by them in the second week in February in the year 1820, I was rather surprised to see a considerable number of scarlet blossoms thereon, in a state of expansion,* but at the same time very few catkins, and those few seemed to be in a very imperfect state, not a single one being nearly prepared to discharge its farina. It immediately struck me that the sterility of my Filberts hitherto had been occasioned by a deficiency of male blossoms. At the same time it occurred to me, that the only probable remedy for the present deficiency, as the female blossoms seemed to be already prepared for male

* There had been, immediately preceding, a fortnight or three weeks of very fine and remarkably warm weather for the season, which had undoubtedly caused these blossoms to expand before their usual time, which commonly does not happen before the latter end of the month.

influence, was, to proceed without delay in quest of some male flowers of the common Hazel; which I accordingly did, and after searching some sheltered parts of the neighbouring lanes, I at length found on some very old wood, a few sprays of catkins just beginning to open. These I gathered, brought home with care, and immediately suspended on the upper part of one of my Filbert trees the most to windward. In a day or two after, I repeated my search, and obtained a few more, and so continued whenever I took a walk, to bring home a few small branches bearing expanding catkins, and to hang them up upon different parts of my Filbert trees, for the space of a week or ten days; when the frost, which had been very severe in the early part of the preceding month of January, again set in with increased severity, so much so, indeed, that it killed and scorched up nearly all the catkins of the Hazel, even those which had not shed their dust, and I entertained little doubt that the female blossoms of my Filberts had shared the same fate; but it proved otherwise. In the course of the summer, perceiving some appearance of fruit, I gave orders, that no person should gather a Filbert from my trees; these, I have no doubt, were strictly observed. At the time of ripening, I collected the whole of the crop myself, and immediately weighed it. The weight was exactly two pounds. Now, although this would seem to be but a moderate crop for two Filbert trees (or rather bushes, for each has several stems) which had been growing nearly or quite twenty years, yet, it was more than they had ever produced before, not only in any *one* year, but (I believe I may venture to say) in *all* the years of their previous existence, and, if I calculate rightly,

it is more than double the annual average quantity which the Rev. Mr. WILLIAMSON, in his valuable Paper on Filberts,* allows the Kentish orchards to produce. That is, supposing the trees in those orchards to stand six feet apart, or to occupy thirty-six square feet of surface each, which as they are not suffered to grow more than six feet in height, I should suppose to be a proper distance.†

On the 28th of the November following (1820), taking a view of my Filbert trees, I observed so large a quantity of young catkins on them as induced me to count the number on two of the boughs, from whence I computed that on the whole of them there could not be fewer than one thousand five hundred. As I had never remarked so large a quantity on them before, I concluded, that, from some cause or other, their constitution was altered; and that in future they would have no need of extrinsic assistance. But again making them a visit in the beginning of the succeeding February (1821) I found that more than three-fourths of the catkins had vanished. Still, I supposed, there might remain sufficient for the purpose of fertilization. But whether so, or not, I had determined to leave my trees the next season to their own exertions. In the summer I repeated my order, that my Filberts were not to be touched, which I might as well have omitted, as there happened to be very little temptation. In the beginning of September (1821) I picked, I believe, every

* See Horticultural Transactions, Vol. iv. page 145.

† Mr. WILLIAMSON, whose trees are allowed to grow more in a natural state, has fifty-seven trees, on three hundred and sixty square yards of ground (see Horticultural Transactions, Vol. iv. page 151); these I calculate, therefore, to stand about seven feet apart.

Filbert on these trees, and, although I do not remember their number, yet I perfectly recollect that I grasped the whole at once in my single hand.

In the following month of October, before the leaves were well off, I cut short the boughs which had projected into the garden, thinned them considerably, by taking out some of the oldest, crooked, and stunted wood, and pruned what remained with some severity; at this time there appeared a pretty fair shew of young catkins, but by no means so many as in the autumn of the former year (1820). By the 26th of January following, (1822,) these catkins had nearly all disappeared, and of those few which remained not one would have blossomed in any degree of perfection. However, as it was my intention to repeat the experiment of auxiliary catkins, I caused every remaining one to be carefully picked off; that in the event of any fruit ripening the next season, the source of the fructifying dust might be subject to no uncertainty. On the 18th of February, (1822,) I caused several small branches of the catkins of the Hazel to be suspended on them, as I intended that the operation should be performed only once, at which time, it is proper to state, I saw so very few female blossoms (from the bearing wood having been so much diminished by the pruning in the previous autumn) that I concluded it to be impossible there could be much fruit, but that if there should be any, the pollen of the suspended amenta of the Hazel must have a share in their production.

The next day (February 19th, 1822), I made a visit to a neighbouring farmer's orchard, who has a row of four Filbert bushes which have been growing therein, quite in a state of

nature, for forty or fifty years, and standing about six feet apart. These I examined minutely. The scarlet blossoms were in plenty, but I am confident there were not more than twenty catkins in any degree of perfection on the whole four bushes; and the owner's wife informed me that they had borne hardly any fruit for many years past. I then told her, that if she wished to have any Filberts in the ensuing season, she must immediately procure some branches of catkins from the Nut-bushes in the hedges, and hang them upon the tops of her Filbert-trees. She seemed much delighted to hear that they could be made to bear by so easy a contrivance, and promised it should be done. I have since understood that it was done, the next day. On the 7th of August, 1822, before the Filberts were ripe, and of course before I could suspect there might have been any diminution of them by depredation, I gathered every Filbert I could find on my trees, and on counting and weighing the collection, found the number to be eighty-six, and the weight half a pound. This was a much greater produce than I had reason to expect from the scanty appearance of the female blossoms in the month of February, and proved, to my judgment, that the catkins of the Hazel had wrought their due effect; more especially as there was not a single nut in the whole number without a kernel, even in a cluster of nine, which I found among them; nor could I observe a maggot in either of them.* On the last day of the same month (August 31st, 1821), my neighbour

* In a communication from Mr. WILLIAMSON, with which I was favoured on the 8th of March, 1823, on this subject, he states, that *last year not one Filbert in forty was good, owing to the ravages of the Nut-maggots;* but, query, might not the failure have been caused by a deficiency of farina?

sent me six pounds* of very fine Filberts, as the produce of his four old stunted trees; he has no others.

If I rightly understand Mr. WILLIAMSON's description (in the Paper before referred to) of the Kentish method of pruning Filbert-trees, the Pruners in their mode of operation necessarily cut away a great proportion of the male blossoms, (for these, I beg leave to state, are for the most part produced towards the extremities of the strongest shoots,) in order to increase the number of female ones. Mr. WILLIAMSON indeed says, that "in pruning care must be taken to have a due supply of males to fructify the female blossoms, or our previous trouble will be entirely useless." But he does not say that the Kentish operators pay any attention to this important point, and I am rather inclined to suppose that the original inventors of their method might have designedly cut away the catkins, on the principle formerly acted upon by many gardeners, who carefully picked off the male blossoms of their Cucumbers, under the notion of being false blossoms. Whilst, therefore, I reflect on the great uncertainty of there remaining a due supply of males to fructify the females, under the unmerciful abscission,† described to be annually practised

* Filberts were last season so scarce in the neighbourhood of Bath as to sell for from a shilling to fourteen-pence a pound in the fruit shops of that city.

† Mr. WILLIAMSON says, (in the communication above referred to, Horticultural Transactions, Vol. iv. page 149,) "The leading shoot is every year to be shortened two thirds or more, and the whole height of the branches must not be suffered to exceed six feet. Every shoot that is left to produce fruit should also be tipped." Mr. PHILLIPS in his Pomarium, page 172, informs us that "in Kent, the Filbert trees are not suffered to grow above five or six feet high, and are kept with a short stem like a Gooseberry bush, and very thin of wood, somewhat in the shape of a punch bowl."

in the Filbert orchards in the county of Kent, in conjunction with the result of the above detailed experiments; I feel fully persuaded that the possessors of Filbert-trees, as well those who have adopted the Kentish method of pruning, as those who never prune at all, would find their account in suspending a few small branches of catkins of the common Hazel on the tops of their Filbert-trees, at the season of dispersing their farina; not only as making an addition to the too scanty number of those naturally remaining thereon, after escaping from the knife of the pruner, the depredation of birds, and the inclemency of the winter, but (if my conjecture be well founded) as supplying them with pollen of a more fertilizing nature than their own.

With respect to the extensive Filbert grounds in the neighbourhood of Maidstone; as it would be quite futile to recommend a levy of auxiliaries from the lanes and hedges, or even from the woods and coppices; for concerns of such magnitude, it may deserve the consideration of the occupiers, whether, under the continuance of their present mode of pruning, it would not be worth while to try the experiment of introducing a few growing plants of the native or wild Hazel into their plantations of Filbert-trees, which last may be considered as exotics, and suffering them to grow at large, without attempting to despoil them of any of their golden honours; as I entertain a strong suspicion that the very frequent failures of the Filbert-crops, (Mr. WILLIAMSON tells us that they totally fail three years out of five) are in great measure occasioned by a deficiency either in number or in power, of the male-blossoms. Without some such auxiliary dependence, I should much prefer Mr. WILLIAMSON's method of pruning to

that of the Kentish pruners, how celebrated soever the latter may be, or how extensively soever it may be practised in the Filbert districts.

In whatever soil or situation I have seen Filbert trees growing, as well as the common Hazel, they have been attended with a continual succession of suckers from their roots; or, if the latter have not been permitted to grow up, they have shewn a strong tendency to produce them. Which would seem to indicate that it is natural, and therefore necessary to the complete prosperity of those trees (or rather shrubs) that their wood should be often renewed. It appears to me, therefore, to be in direct opposition to this propensity of nature, to keep them always on the same stem; which I understand is the custom in Kent. I should rather think it more like pursuing the indication of this unerring guide, to permit several stems to arise from the same root, and after a certain period, to be constantly cutting out some of the old worn out wood, and training up some of the strongest suckers in its place. The more I contemplate this subject, the more am I convinced that there is much room for improvement in the means of obtaining regularly adequate crops of this very agreeable fruit.

I remain, Dear Sir,

Your very obedient Servant,

GEORGE SWAYNE.

Dyrham, near Bath,
January 31, 1823.

XLIV. *On a* Wash for Fruit Trees. *In a Letter to the Secretary. By* John Braddick, *Esq. F. H. S.*

Read May 20, 1823.

My Dear Sir,

Amongst the many *washes* which I have employed for the destruction of insects, on fruit trees, I have met with none so effectual as the water through which the coal gas is passed, for the purpose of purifying it. Its extremely fœtid smell led me to think that no insect could resist its influence, and in this, I believe, I have not been deceived. I mix one pound of flower of brimstone in three gallons of gas water, and add soft soap enough to make it adhere to the buds and branches when laid on with a painter's brush; the composition may be mixed over fire with safety, as it is not inflammable.

It is important to those who wish to try the experiment to know, that it does no injury to the trees; with me it has been fairly tried under glass, on the most delicate of all trees, (the Flat Peach of China) which is now breaking into full leaf with great vigour.

I am, my dear Sir, your's truly,

John Braddick.

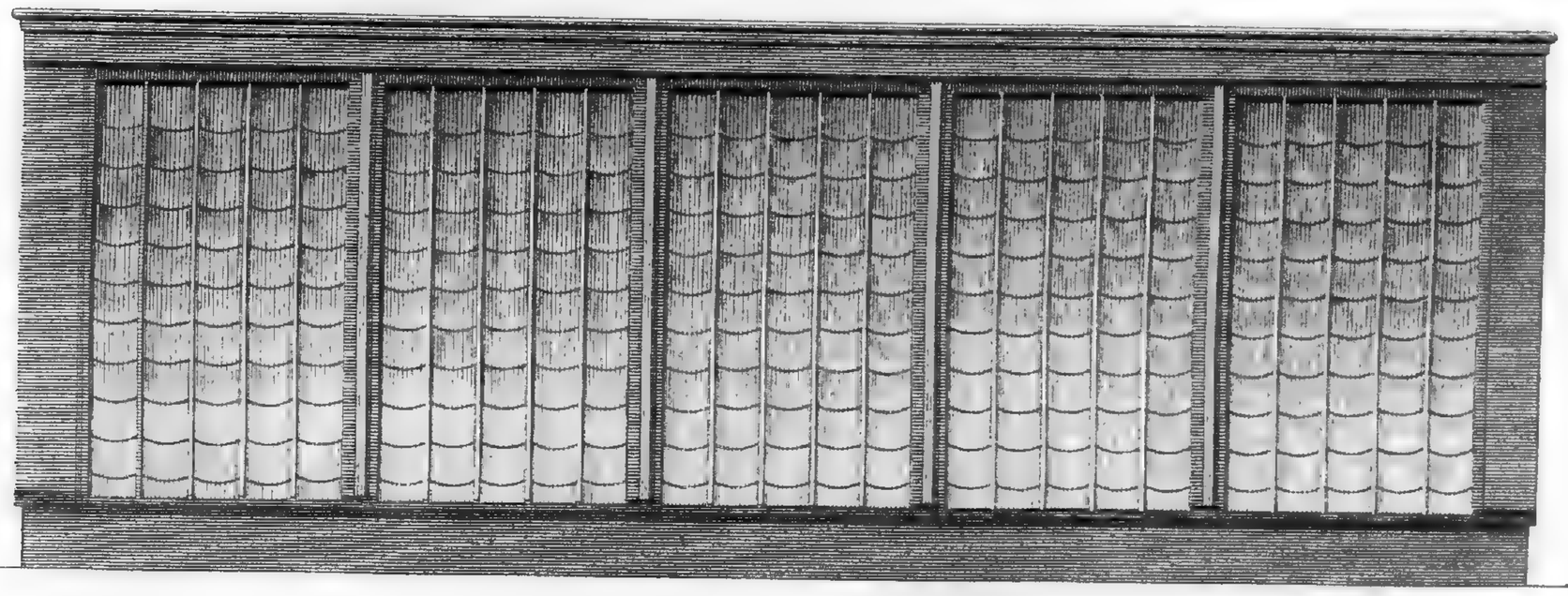
Thames Ditton,
March 4, 1823.

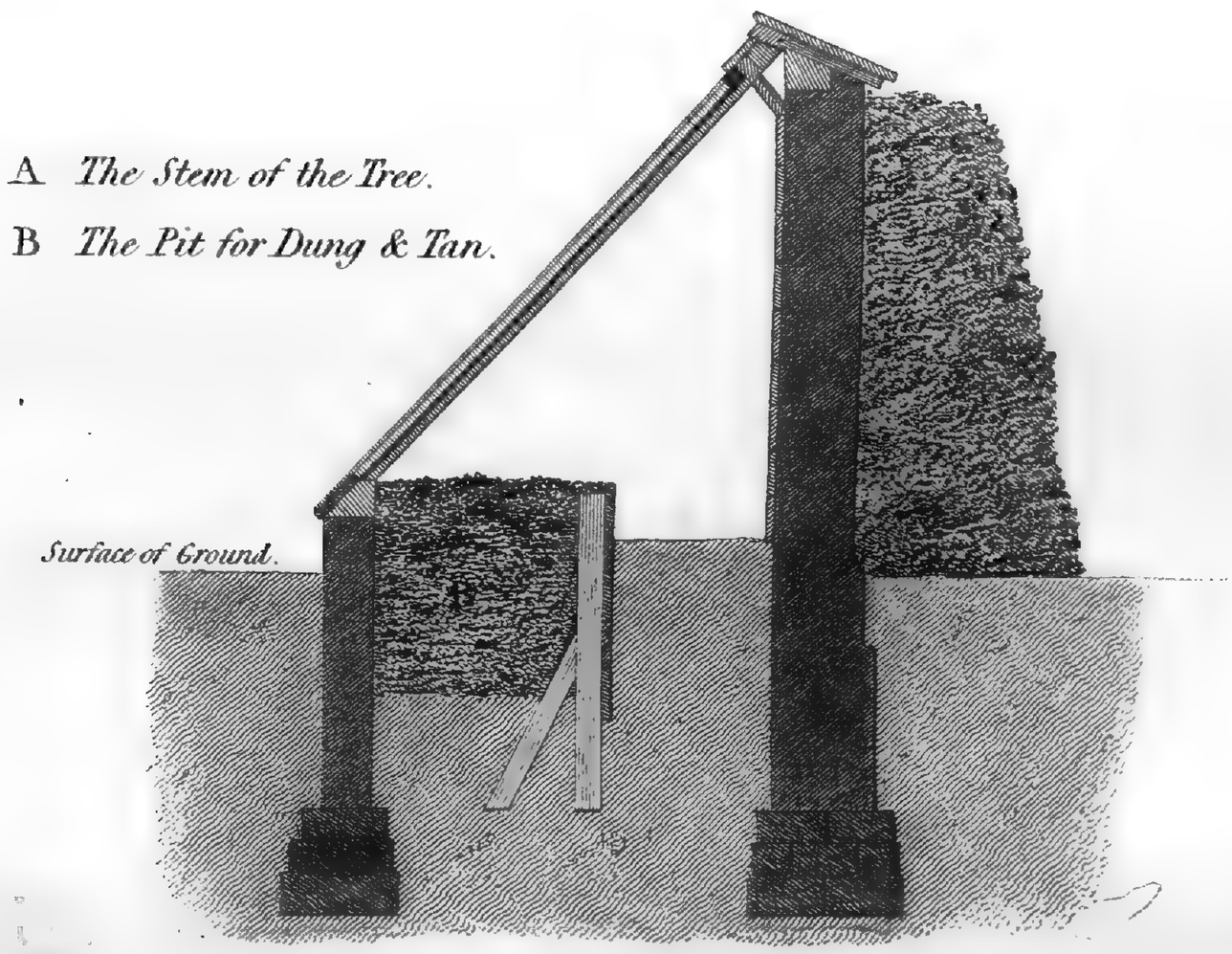
XLV. *An Account of the Methods of* Forcing Peaches in Denmark and Holland. *By Mr.* Peter Lindegaard, *Corresponding Member of the Horticultural Society; Gardener to His Majesty the* King of Denmark, *at the Royal Gardens of Rosenburgh, near Copenhagen.*

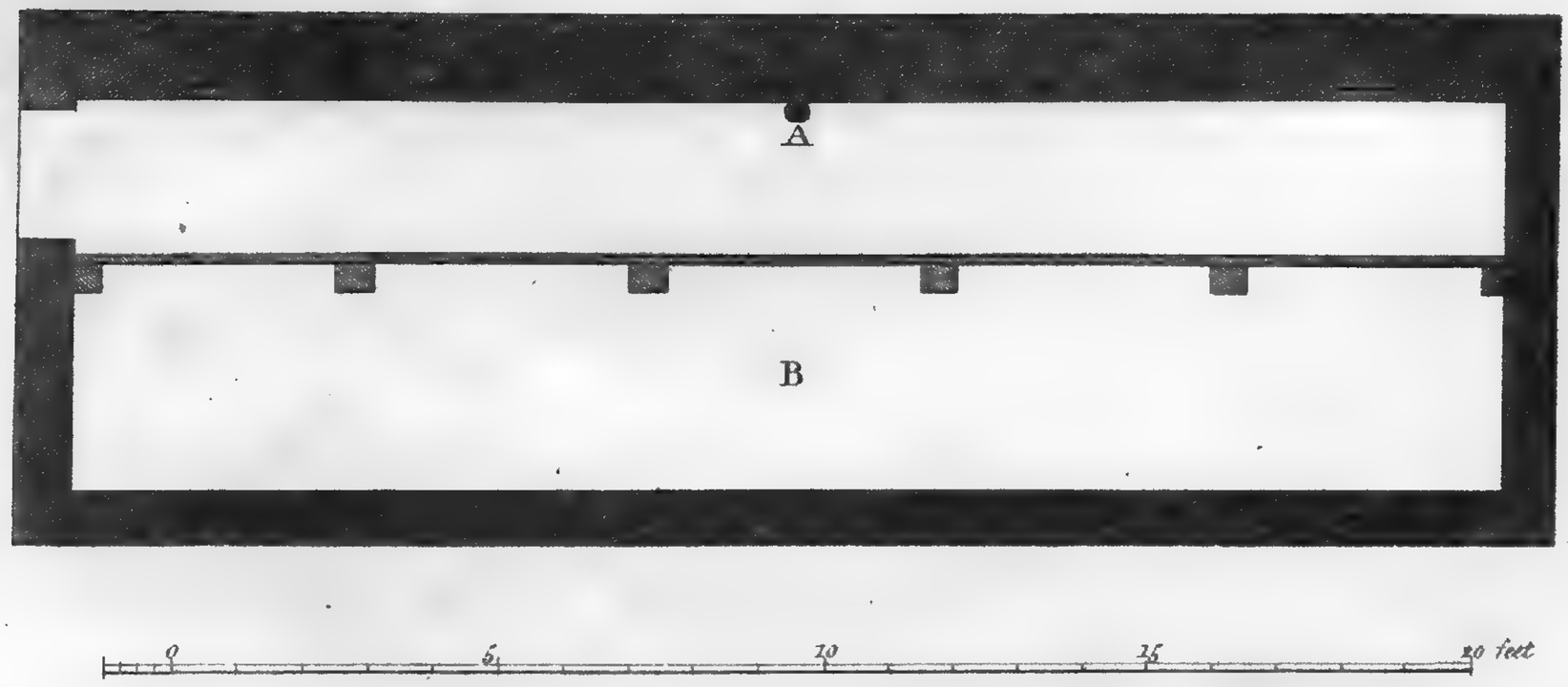
Read January 1, 1822.

In Denmark, our *Forcing-houses for Peaches,* (and the same are used for Grapes,) are in the Dutch fashion, and quite similar to those used in Holland; they are very simply constructed of timber, the back and front walls being brick, with boarding on the inside of the back wall, to which the trees planted against it are trained. The length of our houses is according to the number of the trees; usually five lights, of four feet and a half each, are allotted to a single tree, or ten lights to two trees; when the houses are longer, they are then divided into two or more divisions, according to their length; one or two trees, as may happen, being kept in each division. The width is in general six feet from the inside of the back wall to the inside of the dwarf front wall; the back wall is about six feet and a half high. The annexed elevation, section, and ground-plan, will illustrate my description of the house. Within the front wall is the pit, three feet and a half deep, by three feet and a quarter wide, for receiving the dung and tan used in the forcing. Fire is rarely employed in such forcing-houses, and many years experience has proved that Peach trees and Vines will retain their

Elevation, Section, and Plan of a Peach-house used in Denmark.







Lowry, sc.

health and vigour better and longer when forced by means of dung instead of fire, if proper soil and management are applied, and their produce has, in my opinion, a finer flavour. I have had trees standing in houses of the construction above described more than twenty-five years, alternately forced, that is, one year they were forced early, and the next year late. I have several divisions to enable me to make this change. Forcing-houses of large dimensions, such as they have in England, are rare in Denmark; they do not suit the climate so well, because it is difficult to cover them in the winter.

The earliest period at which we commence forcing our Peach-houses is the latter end of December, or the beginning of January, according to the weather; fresh horse-dung, for the purpose, is thrown up in a heap for some days, to heat, before it is carried into the house and laid into the pit, which should be filled to the top; this is done, if possible, in a fine day; the lights are then put on, and much air, night and day, admitted, so that the steam may pass out of the house; in six or eight days, when the dung has sunk, the vacant space is filled up with tan, which, after a short period, is stirred and loosened for the purpose of inserting pots of Strawberries, French Beans, or other plants. The steam being then nearly exhausted, the house may be closed at night, and the lights covered with a single reed mat, and then, keep up to between eight and ten degrees of Reaumur,* (52° and 54° of Fahrenheit,) in the night but not higher; in a bright day or during a thaw a little air is admitted until the red point on the blossom bud is perceived: less air is then given, and the night covering is increased. As the winters are often

* Reaumur's scale is always used in Denmark.

severe in Denmark, we are obliged to cover our forcing-houses very thickly, particularly when we begin to force so early; mats made of haulm or straw are fastened on the top of the house to roll down over the lights, and over these, we lay mats made of reeds.

The wall behind the house is protected with a large lining of leaves which have been collected in the previous autumn: beneath the leaves, we usually scatter a layer of horse-dung to accelerate the heating of the leaves. After the leaves have been placed there three weeks, they will have sunk much, and should then be renewed; they must always be kept as high as the top of the house; the mass must be three feet thick, at least; the wall will, by this means, be kept warm the whole winter, and consequently, in mild weather, the top covering of the lights may sometimes be lessened.

The principle on which I act is, to commence forcing slowly, as well as to end slowly. When the trees begin to unfold their blossoms, which is about the end of February, I admit no more air, for the sap at that period being much in motion, and the shoots and blossoms tender, they would, by exposure, risk suffering from cutting winds. As a protection from the strong influence of bright sun, I shade the glass with branches of trees, thus moderating the sun's heat. I do not allow the thermometer, when placed in the shade, to rise higher than sixteen degrees, (68° of FAHRENHEIT.)

After the fruit has set, and when the blossoms have fallen, the warmth is increased, by increasing the coverings, till the Peaches begin to stone. When the Peaches are so far advanced as to be stationary, preparatory to stoning, or, in other words, when they are forming their stones, (which may

be calculated to happen about the middle of April,) we then begin again to admit air, and to lessen the coverings, as we have at that period milder weather.

The Peaches require about five weeks to form the stone; this is well known to every experienced gardener: a moderate temperature during that period must be preserved; but I have often seen gardeners keep their houses almost equally warm at every period: this is a great error, particularly when the fruit is stationary for stoning; it causes many of the Peaches to fall off unripe.

When the Peaches begin again to swell (which I perceived this year, 1821, in my first Peach-house about the 11th of May), much air is admitted, and as soon as they acquire colour, the lights are not shut up close in the night, that the trees may be inured to the open air. A fortnight before the fruit ripens we remove the lights, as I have always observed that Peaches in the open air, without the intervention of lights, will attain a much finer colour, as well as flavour, and the trees likewise gain much in strength and vigour.*

As the roots in these narrow houses are much confined, watering at certain times is necessary, and particularly when the fruit begins to swell. To keep off the red spider, the trees are sprinkled with water by means of a syringe, which

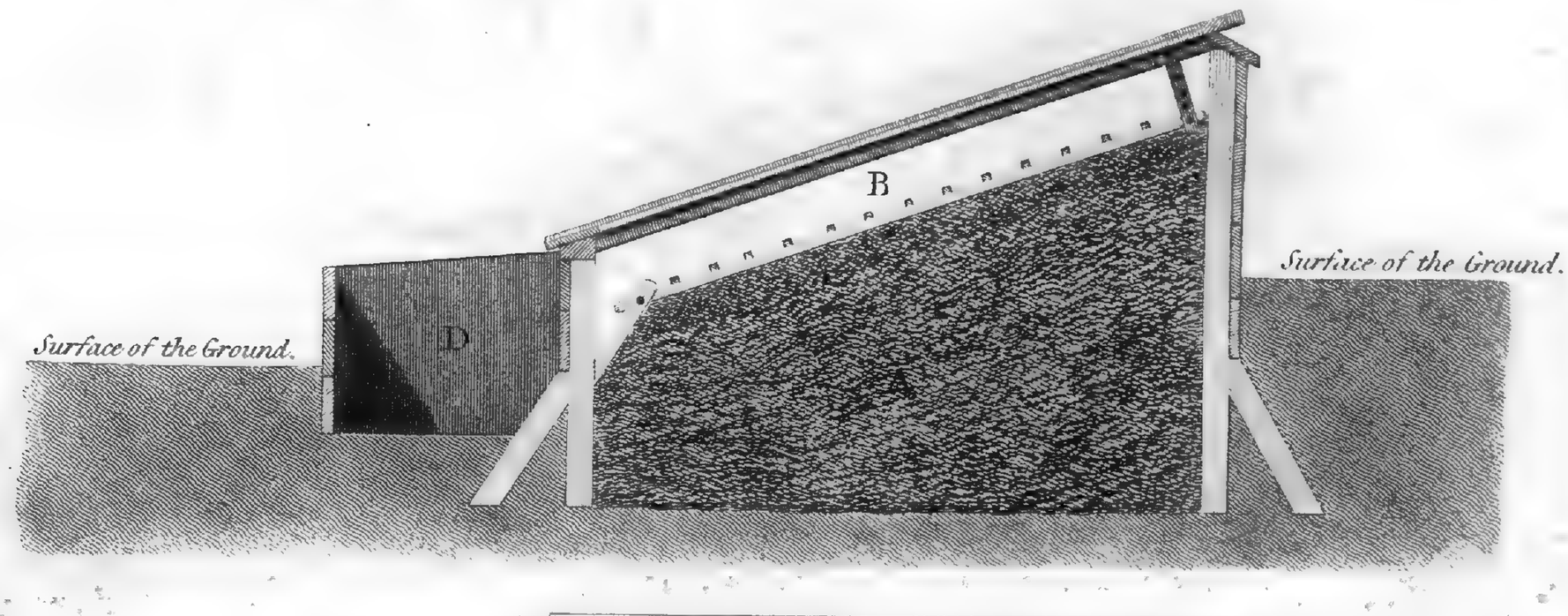
* An old gardener in Holland told me the origin of the first Peach-house in that country; it happened in a bad season (such as the present 1821,) that the Peaches on the walls would not ripen; the gardener contrived to put the lights of the hot-bed against the trees, and by that means got the Peaches ripe: after that time forcing-houses were constructed. The place where this accidental discovery was made was Waaterfleed, between Haarlem and Beverwyck, near the little village Velsen; how long it is since, I did not learn.

is more convenient than a hand-engine, and more completely washes and cleans the leaves.

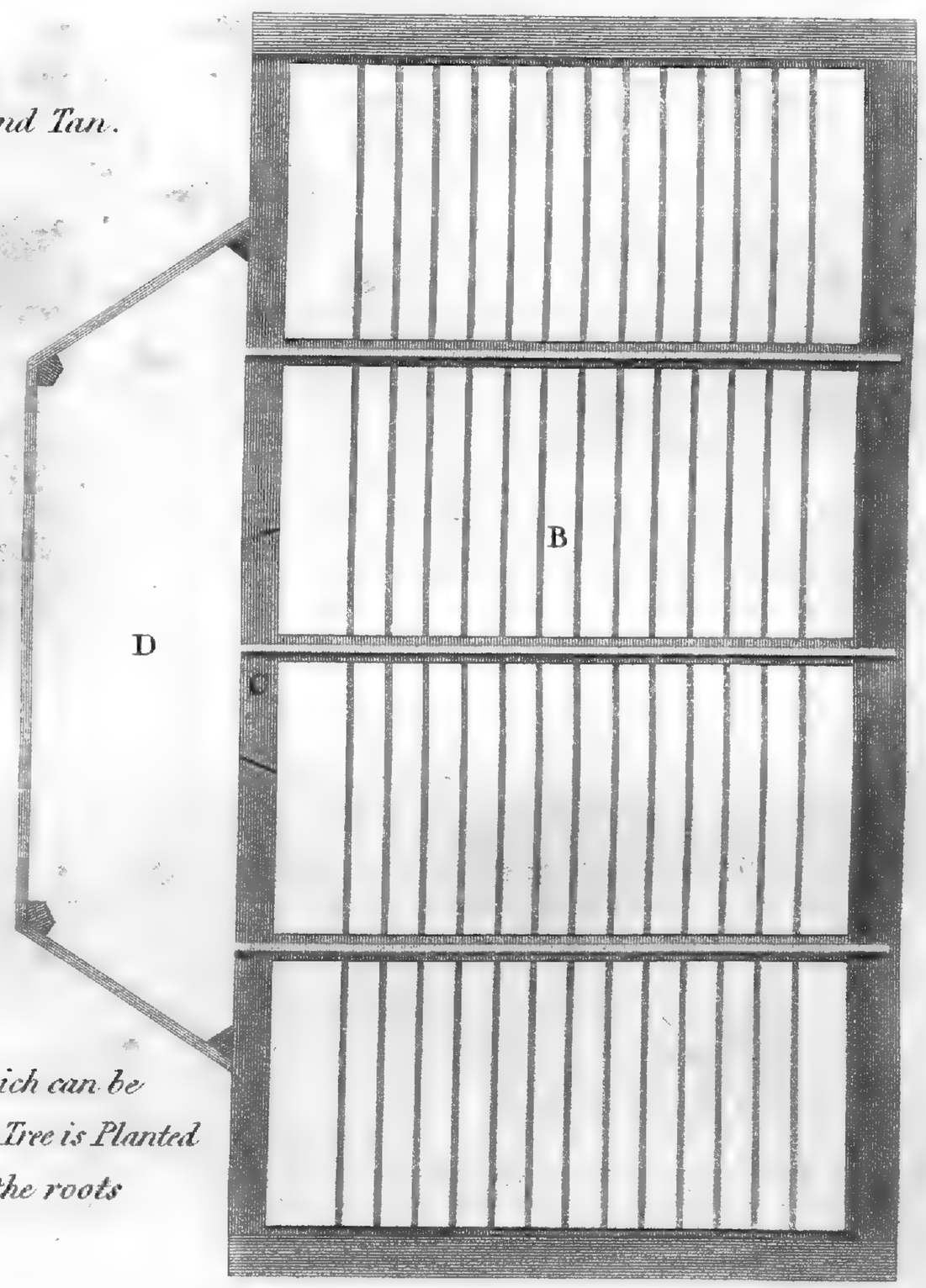
Another construction for forcing Peaches is much used in Holland; its form is like a common hot-bed, with a frame of three or four lights; but this plan is not much followed in Denmark, partly because of our bad climate, and also because it requires closer attention than that of our common Peach-houses. I have seen it practised in Holland, and it answers well there; the Dutch gardeners have their earliest Peaches by this way; sometimes even in the middle of May. Some gardeners have two such frames, the first to come in early, the second for a succession. I myself have practised this method with more or less success, upwards of thirty-six years, and will now, as well as I am able, proceed to describe it. The annexed section and plan will assist my description.

In selecting a tree to be forced, one should be chosen which is large enough to fill a frame of four lights: I always choose trees of not over-luxuriant growth, and with well ripened wood. It is expedient to fix on the tree in the autumn, for it is necessary to cover its roots with leaves or litter before severe weather sets in, to prevent the frost penetrating the soil, and so hinder the removal of the tree. I commence the work sometimes in the beginning of January, sometimes later; this year I introduced the tree into the frame on the 27th of January, and some of the Peaches ripened the 29th of June. The pit must first be filled with fresh horse-dung, and the lights immediately put on to exclude snow or rain; as soon as the dung begins to heat, much air is given to allow the evaporation of the dung to escape.

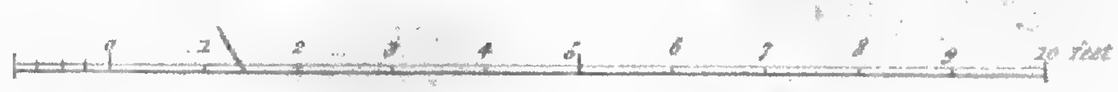
Section and Plan of a Dutch Peach pit.



A. *The Pit for Dung and Tan.*
B. *Trellis.*



C. *A Piece of Plank which can be be taken off when the Tree is Planted*
D. *The Case or Box for the roots of the Tree.*



Lowry, sc.

When eight or ten days are passed, the dung will be sunk enough to admit of its being covered with tan, which must, after some days, be stirred, and from time to time be filled up, it being necessary that the pit should be quite full before the trellis is laid upon it. When this preparatory work is completed, I proceed to plant the tree. Great precaution must be observed in digging up the tree to take up every root with its fibres entire and unbroken. The mould in which the trees should be planted must be rich, but not stiff. After the tree is planted it must be spread over the trellis, then pruned, and the strong shoots taken out; I then leave it for a few days untied till it has settled. I proceed afterwards very slowly; air is admitted day and night, and the lights only covered with a single reed mat in the night, for I consider the tree should be kept in a torpid state till the roots begin to work. When the sap begins to move, and the buds to swell, the red dot in the flower buds will soon make its appearance; I observed it, this year, 1821, on the 25th of February; the sap is consequently at such period in full action, the admission of air must therefore then be lessened, and covering in proportion to the weather, the climate being likewise considered, increased. It is also necessary to put a lining round the bed to support the internal heat, which will have been lessened by the admission of air. The lining consists of leaves, mixed with a little horse-dung to quicken them. But it is to be observed that the roots or foot of the tree must be well covered, first with a layer of dry moss an inch and a half thick, and over that with layers of mats according to the weather, so that the roots may have the same temperature as if the tree were growing in a Peach-house. The mats must, consequently,

remain over the roots of the tree night and day, and be taken off only in a bright day when the sun has power enough to keep the earth at the requisite temperature. I do not leave the roots of the trees entirely uncovered till the middle, or latter end of May. The admission of air is lessened when the buds shew the red dot: but the lights are not shut up entirely at night till the blossom leaves begin to fall; after that period no more air is given at night, for the temperature must then be encreased in the night to not less than ten degrees, nor higher than thirteen degrees (from 55° to 58° of FAHRENHEIT.) It is in the gardener's power to lessen or augment the temperature by means of his linings and mats. It is scarcely necessary to add, that in a bright day a little air must be admitted, or the lights be shaded: I prefer the latter, for, supposing it to be in February, when frosty air and cutting winds prevail, these would soon hurt the tender blossoms, or the setting fruits, if exposed by opening the lights. I therefore spread the sprays or branches of lime or other trees over the lights to moderate the effect of the sun's rays: the thermometer may, perhaps, without danger, in such days, rise to twenty-four degrees, (87° of FAHRENHEIT.) When the Peaches have attained the size of a hazel-nut, I then begin to admit a little air, encreasing the admission further in the spring: but shading is however applied until the middle of April, or even later, according to the weather. I never risk so much, in using shading combined with a little air, as by airing without shade, and particularly on this plan, where the tree is so near the glass, and consequently more exposed to the sun's rays than in a common Peach-house. About the

middle, or latter end of April, the shoots are so much grown as to come in contact with the glass, and it is of course necessary, in a fine day, to take off the lights for thinning these. When the Peaches begin to form the stone, that is, about the beginning of May, much air must be admitted, and particularly on fine days. I never let the thermometer rise higher than twenty-five degrees (88° of FAHRENHEIT,) although it be so placed that the sun's rays act upon it; should a particularly bright day occur, I then have recourse to a little shading. When the Peaches are nearly full grown, the admission of air is encreased, and the lights are not closed in the night, in order to inure the trees and fruit to the open air. When the Peaches approach their ripening, I then remove the lights entirely: this, if possible, should be done on a cloudy day; but however it will be necessary, during sunshine, in the succeeding eight days, to put some sprays of branches over the tree, for the sun's rays at this period fall almost perpendicularly upon the tree, and would injure the fruit.

When the roots of the tree are exposed to the open air, that is, when the mats and moss are taken off, great attention must be paid in supplying them sufficiently with water, for they are much exposed to the influence of the sun and air. The sort of Peach which is used generally for forcing on this plan, and also in the other Peach-houses, is the Double Montagne; it was introduced into Denmark from Holland, and is by the Dutch, as well as by us, considered the best kind for forcing.

For the Dutch frame, I always choose trees from sixteen to twenty years old; they never suffer by transplanting when

they are budded upon Plum-stocks, which is the common practice with us, and in Holland. In the autumn, when the leaves are fallen, I remove the tree which has been forced, and replant it against the wall: when it has stood there two years, I can use it for the frame again. I consider that Peaches forced in this way are much finer flavoured, and higher coloured than in common Peach-houses: first, as the tree is more exposed to the sun and light, and nearer to the external air when forced; and, secondly, from being planted in newly prepared earth, which is beneficial and has much influence on the fruit.

It cannot be denied that large forcing houses produce more fruit than small ones; but if we consider the expense of fuel which is saved by the small ones, when forced with horse-dung only, without fire, it cannot be a question which of them are preferable. For a gentleman, living at his country-house, who only wishes to produce fruit for his own table, and not for sale, the small forcing houses must surely be more advantageous. Suppose he has three forcing houses, or a range in three divisions for Peaches and Nectarines, each of ten lights, which is space enough for two trees in each division. If the forcing of the first was commenced in the latter end of December, that would afford ripe Peaches about the middle of June. The second division should then be worked from the beginning of February, and the last, in the middle of March, and this may be also more naturally and slowly forced, so as just to reach the ripening on the natural walls: the table would then be supplied with Peaches till the middle, or end of October. In succeeding years, by alternation of the periods of forcing, each division should in

time be forced in the earliest, in the middle, or in the latest season.

I have seen Peach-houses in Holland of the same dimensions as that I have described, which were forced with fire and horse-dung together: from these they had Peaches ripe by the middle of May, but such early produce is always precarious, not abundant, and sometimes of inferior flavour. The flues are liable to crack, and to let out the smoke, and the fuel used in Holland being chiefly turf, which contains a great deal of sulphur, it is very injurious to the fruit, and to the trees.

XLVI. *On the Modes now practised in Austria of* Cultivating Asparagus. *By Mr.* Jacob Baumann *of Vienna, Corresponding Member of the Horticultural Society.*

Read December 3, 1822.

The seed of Asparagus should be gathered from the finest stems, of plants not less than seven years old. Seeds, from whatever country they may be procured, are generally good, though what are produced by plants perfectly inured to the climate where they are to be sown, should always be preferred.

Towards the end of March, the seeds must be dibbled in beds of good earth, in rows at nine inches apart, three inches between each seed, and at one inch deep.

The proper treatment of the young plants consists in keeping them clean, frequently stirring the soil, and in repeated waterings, according as they require moisture. In the following March, the roots, now a year old, must be taken up with all their fibres, and planted out as may be predetermined.

Asparagus is sometimes raised for use in the spring and summer months, and sometimes for winter use. To obtain the first of these objects, the year old roots should be planted out in a piece of good, deep, somewhat loose arable land, or in the ordinary soil of a kitchen garden, or in artificial Asparagus beds, in which they are to remain permanently as long as they continue productive. With a view to the

second object, they should be transplanted into a good rich kitchen garden soil, in order to be taken up again a few years after, for ulterior treatment.

For open field culture of Asparagus, trenches must be dug late in autumn, at two feet asunder, as many in depth, and eighteen inches in width; the earth must be thrown up between the trenches, so that it may be exposed to the full influence of the atmosphere. In the spring, old decayed neat's dung must be put into these trenches to the depth of eight or ten inches, and moderately trodden down, and over this about eight inches of mould; then in the centre of these trenches, at full eighteen inches asunder, must be formed small conical heaps of earth, on which the roots are to be placed, with as many of their fibres as possible in their naturally separated state, and to be covered with about four inches of earth. The surface of the field is then to be so formed as that each row of plants will present a shallow trench for the purpose of conveying the rain which may fall, to the roots of the plants.

The management of this Asparagus field, (which will last in full vigour from eight to ten years, with moderate treatment,) consists, in addition to its being kept clean, more especially, in stirring the earth well in the trenches, late in every autumn, before frost sets in, and then covering the trenches to the height of two inches with old neat's dung, the coarser remains of which, in the following spring, must be cleared away, and the finer part mixed with the soil by a careful digging. By this simple and cheap method is raised the vast quantity of Asparagus which is seen in the markets of Vienna throughout the spring.

The planting of Asparagus in the kitchen garden is done

in exactly the same way; except that the place destined for it must be trenched at least two feet deep, plentifully manured; and, during the first year, watered, in dry weather, as often as is needful.

In order to form artificial Asparagus beds, the following process is the most simple. In autumn, let the earth in a part of the garden, which lies fully exposed to the sun, and sheltered from the north, be dug out to the breadth of six feet, and in depth from five to six feet; this trench is then to be filled with decayed neat's dung, and cleanly sifted earth, in alternate layers of about six inches in thickness. In the following spring, the deficiency caused in the bed by sinking must be made up with earth mixed with well decayed dung, and the planting out of the choicest year-old roots begun, setting the roots in quincunx, at the distance of full two feet asunder, and covering them to the depth of four inches with good earth. In the autumn, after the stalks are cut down, and the earth stirred, the bed must be covered two inches deep with old decayed neat's dung, which, in the next spring, is to be worked under the surface by careful digging. This is to be continued every successive spring, till the stratum of earth which covers the heads of the roots has reached the thickness of from six to eight inches; a mere surface dunging is then to be given, and this, after lying on through the winter, is at the proper time in the following spring to be cleared off. Managed in this way, the Asparagus plants last for fifteen years, and yield, according to the requisite strength they attain, unusually thick shoots.

If it be intended to plant Asparagus for winter use, the one-year roots must then be put into a piece of good garden

ground, previously trenched two feet deep, and richly manured, in quincunx, at eighteen inches asunder, and carefully attended to for four or five years, after which they are to be taken up late in the autumn, and preserved for future use in a trench which must be protected from frost by a suitable covering.

For the purpose of forcing these roots, make with fresh horse dung an ordinary hot-bed (with its glass and other requisite coverings), upon which, at least eight or ten inches of manured earth must be laid, and the roots planted together therein, in tolerably close rows, the intervals between the rows being filled with the same kind of earth, and the crowns of the roots covered to the depth of four inches.

The artificial Asparagus beds may be forced also to produce a crop in winter; when, however, this object is in view, the intervals between the rows must be made at least four feet broad when the beds are formed. The beds usually selected to be thus forced, are such as, from the length of time they have been in use, cannot be expected to last much longer. On both sides, and at the ends of the bed destined to be forced, a trench three feet broad and four feet deep must be dug close to the outermost rows of plants. The bed should have been well stirred, and, before the frost sets in, must be furnished with requisite coverings of glass, mats, &c. &c. when the artificial heat produced by the fresh horse dung in the trenches, and kept up in the usual way, will force the plants to produce shoots until they are completely exhausted.

When an Asparagus field or an artificial bed not destined to forcing, becomes too much weakened by age, it may then be entirely cut down; to do which with most advantage, the

shoots fit for use must be gathered, and the weakest suffered to remain standing, to keep alive the vegetative power as long as possible. By these means we obtain in July, and even later, a fewheads of Asparagus, though of inferior size and quality.

To give to Asparagus shoots growing in the open air as much length and tenderness as possible, there is inserted over each stem destined to be gathered, as soon as it shoots above ground, a wooden tube or pipe eighteen inches high, and one inch in diameter.

To the above description of the modes in use in Austria for the culture of Asparagus, the following practical observations may be added.

1st. The plants must not be cut for use for five years, if we wish to have them in the fullest health and strength, and to obtain the strongest possible shoots.

2d. Subsequently, too many shoots must not be cut from any root.

3rd. We must not be too eager to gather the best, but leave on each plant two or three of the strongest shoots, to prevent its premature exhaustion by the evolution of new shoots.

4th. No other vegetable should be grown on Asparagus beds.

5th. Every new plantation of Asparagus must always be in new ground, or at least in ground which has been employed for several years in the culture of other vegetables, since it was used for Asparagus; and,

Lastly, when a fresh plantation is intended for artificial beds, which generally occupy a place set apart for the purpose in the garden, the old earth must be cleared out to the requisite depth, and its place supplied with new.

Note by the Secretary.

The following notes relative to the cultivation of Asparagus at Vienna, were communicated to the Society by Dr. FORBES, shortly before Mr. BAUMANN's Paper was received; as they appear to contain some additional information on the subject, they are now given.

"To raise a bed of Asparagus which should last from twenty to twenty-five years, and produce thick and white stalks fit for use, particular care should be taken to choose a warm situation, in order to have it sheltered against the north-east winds. The bed should be four feet in breadth, and the earth ought to be dug out four feet. To fill up this cavity, the first layer ought to be one foot thick, consisting of dung, horn chips, wood chips, bones of cattle, ox horns, and decayed and withered branches of shrubs or trees, the whole of which must be covered with a layer of the same thickness of the mould that has been dug out. Cover this afterwards with cow-dung mixed with the mud of a river or pond, let this be half a foot thick: then make another layer of mould of the same thickness, and go on in this way alternately with the mixed manure and mould, till the whole space is filled up.

"The bed ought to be made in the autumn, that the ground may have full time to settle. In the spring, before the seeds are sown, all the layers, except the ground layer of horns, &c. must be turned over and mixed together; then levelled with a rake, and the bed divided with a line, into three parts of the same width, on these lines the seed must be sown in holes of a foot deep, at a distance of two and a half feet apart,

but not less than three grains in each hole, so that if one or two should fail, there is still hope of the remainder taking.

"In order to preserve the whiteness of the Asparagus shoots, they should be covered with a wooden or earthen pipe of twelve or fifteen inches height, with a hole in the top."

XLVII. *A Notice of certain* Seedling Varieties of Amaryllis, *presented to the Society by the Hon. and Rev.* William Herbert, *in* 1820, *which flowered in the Society's Garden in February* 1823. *By Mr.* John Lindley, *F. L. S. &c. Assistant Secretary at the Garden.*

Read March 4, 1823.

In the third Volume of the Society's Transactions, it is stated by the Hon. and Rev. William Herbert, in a Paper upon the subject of *Hybrid Plants*,* "that he then possessed several mule Amaryllises, from which he had great expectations;" and in the fourth Volume of the Transactions, in an essay by the same Gentleman, upon the production of hybrid individuals, it is remarked,† that he had sent, "twenty-four bulbs to the Society, each of which was an offset from a different seedling of a mule *Amaryllis equestri-vittata*, crossed again with *Amaryllis rutila* and *Amaryllis fulgida*, which from their rapid growth and increase, their free habit, and probable beauty of blossom, were likely to become favourites in every collection."

At the time the above Papers were read, it seemed improbable, and contrary to general observation, that plants obtained under such circumstances should be not only more beautiful than either parent, but even productive of flowers in greater profusion. It is therefore very gratifying to me to

* See Horticultural Transactions, Vol. iii. page 196.

† See Horticultural Transactions, Vol. iv. page 43.

announce that these seedlings actually exceed those from which they are derived in both respects, as is evident from the specimens exhibited this day, which have blossomed in one of the stoves in the garden of the Society at Chiswick.

It is stated by Mr. HERBERT that the twenty-four bulbs which he sent to the Society, were each the offset of a different seedling. There do not however appear to be more than nine which are capable of being distinguished from each other, and of these only four are remarkably superior in beauty to the plants named as their parents. It is also obvious, that none of the plants bear a decided resemblance to any of their supposed parents, except to *Amaryllis rutila,* to which they are so similar, that a botanist, in ignorance of their history, would not have hesitated to refer them all to that species; of which indeed it may still be doubted whether they are not mere natural varieties, rather than hybrid productions; for Mr. HERBERT's admission,* that in certain cases the pollen of *A. fulgida* was not applied till some time after that of *A. rutila,* and the absence of similarity in the seedlings to the former plant, are sufficient to create a doubt whether the impregnation was affected by *A. fulgida;* and the female parent is stated to have been a seedling obtained by an intermixture of *A. equestris* and *A. vittata,* but it may probably have been a mere variety of the former, and it is to be suspected, that it must have been so, since no circumstance whatsoever in the seedling plants indicates the presence of *A. vittata.*

If, therefore, the apparently complex origin of Mr. HERBERT's seedlings be thus explained away, by reducing their

* See Horticultural Transactions, Vol, iv. page 43.

parents to *A. rutila* and *A. equestris*, the question, whether they are hybrid productions or natural varieties is brought within the much narrower compass of deciding whether or not *A. equestris* and *A. rutila* are specifically distinct from each other. Upon which subject the seedling plants themselves will offer the best evidence. If they should prove fertile it must be inferred that they are natural varieties, and that the technical distinctions by which botanists have divided their parents are unnatural and insufficient; a conjecture, I apprehend, future experience not unlikely to confirm. But if they should be sterile, they will maintain their claim to hybridity and the distinct origin of their parents may be considered as established.

Such at least are the inferences which must be drawn, so long as the principles of Kölreuter and other writers who have investigated the subject of vegetable hybridity with the greatest precision, remain unshaken. And I cannot forbear adding, that these are completely confirmed by such instances as have come within my own observation of fertility in plants supposed to be hybrid.

It will perhaps be urged that the splendid variety of Amaryllis obtained* by Mr. Gowen from the impregnation of *A. Reginæ* with *A. vittata*, is a proof that fertile plants may be procured by the intermixture of two distinct species; and that therefore the test of hybridity above alluded to, is not infallible. But it may be replied, that it is well known that other instances have occurred in which the union of two natural species has produced a third stock which was proved to be fertile to the extent of even three generations; but that after

* See Horticultural Transactions, Vol. iv. page 498.

that term it perished; and as far as I am informed, experiments in raising this variety from seed have not been carried beyond the first generation. The test of hybridity is not the ascertaining whether a given plant is susceptible of propagation, but of perpetuation by seed.

At the time when Mr. Gowen's new hybrid plant was sent to the Society (viz. in August, 1821) and when the account of it was printed, it was supposed that there was no difference between it and the old *Amaryllis Johnsoni.* Its beauty has however increased very much with its age, and the flowers it has now produced are so much more rich and glowing in colour than those of *Amaryllis Johnsoni,* that a figure of it has been ordered by the Council to be published from a drawing by Miss Cotton, to accompany this Paper.

Hybrid Amaryllis Regina vittata

XLVIII. *An Account of an* improved *Method of obtaining* Early Crops of Peas, *after severe Winters. By* Thomas Andrew Knight, *Esq. F. R. S. &c. President.*

Read May 23d, 1823.

Considering even trivial improvements to be important relatively to the management of those species of plants upon the culture of which much labour and capital are annually expended, for private use and for the supply of the public markets, I address to the Horticultural Society the following *account of a mode of obtaining an early crop of Peas,* which I have practised with great success in the present spring.

When severe winters, such as the last, have proved fatal to crops of Peas sowed in the preceding autumn, many gardeners have experienced the advantages of raising other plants in pots, with artificial heat, early in the spring, and subsequently transplanting them into the common soil: and the object of the present communication is only to describe an improvement in the mode of repeating this operation.

In the present spring my garden, owing to its soil being cold, and the climate rather inhospitable, did not contain, in the end of February, a single living Pea plant; and I purposely delayed the experiment, which I proceed to relate, till the first day of March. Upon that day the ground was prepared, and part of the seed sown, as usual, in rows, where the plants were to remain; at the same time other Peas, of the same early kind, were sown in circles within the circum-

ference of pots of ten inches in diameter, inside measure. These pots were nearly filled with a compost of a peculiar kind, from the highly nutritive and stimulating qualities of which, I anticipated much acceleration in the growth of my plants, with the advantages of being able to remove them, at the proper period, to the open ground, without having their roots at all detached from their pasture, owing to the fibrous organic texture of the compost. This was made of equal parts of thin turf to which much lifeless herbage was attached, and unfermented horse dung, without litter; and a quantity of the ashes of burnt weeds, containing, as usual, a good deal of burnt mould, equivalent in bulk to about one-twelfth of the other materials.* The whole was reduced to small fragments, and well intermixed; and the pots were filled with it within an inch of their tops. The Peas were then sown upon the surface of the compost, and covered with common mould; and the pots were placed in my Peach-house. In this they remained till the plants were an inch high, when they were removed into the open air; but they were protected during the night, for some time, and particularly when the character of the evening indicated the probability of frost.

In the last week of March, the plants were taken from the pots and planted in rows in the open ground; and I have the satisfaction to observe, that very nearly the whole of the compost adhered firmly to their roots; and that their growth subsequently was not apparently checked, in any degree, by their transplantation. They were placed in rows contiguous

* Equal parts of fresh soil with unfermented horse-dung, with litter, and a small quantity of quick lime, or wood ashes, would probably operate as powerfully as the compost above described.

to those which had been previously sown, a small quantity of compost, similar to that put into the pots, being added; and the common mould was then closed round their roots, and raised upon each side of the rows. Sticks to support and protect the plants were immediately added, in rather more than the ordinary number and quantity; and subsequently no particular care, or attention, was paid to them.

On the morning of the 29th of April, I ascertained the comparative growth of my plants, which had been subjected to the different modes of treatment above mentioned, in two rows which grew contiguous to each other: when I found the height of those, which had been raised in pots to be fifteen inches, and that of the others to be scarcely four inches; and I much doubt whether I ever possessed, in the most favourable season, as forward a crop of Peas as my garden now contains.

Many causes appear to me to have operated in conjunction to produce the foregoing effects. It has long been known that snow does not, in winter, lie so long upon ground, which has been manured in the same season with fresh unfermented horse dung, as upon unmanured ground; and therefore I conclude that some degree of heat existed in, and emanated from, the compost, though probably never in a sufficient degree to have been sensible to the touch of any warm blooded animal. If placed in a considerable heap, such a compost, as that described, and even when the horse dung is much less in quantity, will heat violently. I have often suffered the compost of this kind, which I employ for Pine Apples, to become hot to prevent the subsequent appearance of earth worms in it.

If heat was in any degree generated by the compost in which the Peas grew, the escape of it was necessarily retarded by the numerous sticks by which the ground was partially covered;* and little injury could have been sustained from the shade of those, because the quantity of light, comparatively with the temperature of the air, and growth of the plants, is very great after the vernal equinox; and it is every day increasing in power and influence.

Another cause of the rapid growth of the transplanted Peas has probably been the very favourable state of the soil in which they have been placed, it having been turned over with the spade immediately before transplantation took place: for Peas never thrive well in strong soils, when such have been compressed and soddened, in early spring, by much moisture. But the chief causes of their very rapid growth have, I believe, been the highly nutritive and stimulating quality of the compost, and the presence of some degree of additional warmth. For I have in former seasons derived great advantage from placing a moderate quantity of nearly similar compost immediately under rows of Peas, which have been sown in the usual manner; except that the seeds were placed upon the surface of the soil, within which the compost had been buried, and covered by having had the soil collected from each side to form a ridge over them. In all cases where a compost of the kind I have described, is employed to accelerate the growth of dwarfish and early Peas, it should be used in small quantities only; that the early growth of the plants may be promoted, without excessive, and consequently injurious, luxuriance being given. For

* Wells's Theory of Dew.

transplanted Peas, I should prefer a poor and light soil; so that the roots might be led, as they would be under such circumstances, to confine themselves to narrow limits: and the plants consequently be brought to an early maturity.

Note by the Secretary.

In a Letter received from Mr. KNIGHT, dated the 27th of June, he mentions that he had then seen the full result of his experiment on the mode of raising early Peas, above described. The plants so treated had produced a very abundant crop at least twelve days earlier than those sown at the same time in the usual way, and with a much more rapid succession of produce.

XLIX. *On the Management of* Fig-trees *in the open air. In a Letter to the Secretary. By Mr.* Samuel Sawyer, *Gardener to* Isaac Lyon Goldsmid, *Esq. F. H. S.*

Read February 4, 1823.

Sir,

I submit to the consideration of the Horticultural Society the following account of my *mode of managing Fig-trees in the open air*, with the names of the best sorts for cultivation, so as to have a regular succession of fruit from August to October. I shall begin at the period when the trees are in an inactive state, that is, in November, following the seasons round to the next autumn. In the beginning of that month I detach the whole of the branches from the walls, removing all the nails and shreds, after which I carefully examine the autumnal fruits, leaving on the branches all that have a firm skin and are of a dark green colour, and that do not exceed the common Filbert in size. Those which are not of that description I remove. I then draw into a sort of cone as many of the branches as are contiguous to each other, and tie them together, filling all the vacant spaces between the branches in these cones, with short, dry, and clean hay, and roll double mats over the whole, being particularly careful to guard the extremity of the branches from the inclemency of the winter's frost. I then lower the whole of the cones either to the right or left, as may be convenient, in such a manner that the tops of each may be at least two feet below the top of the wall,

they are then made fast to the wall with good ties of rope yarn. I let them remain in this state until March, when I take off the mats, and remove the hay. Selecting the best placed and most productive branches, and taking out ill placed, superfluous, and irregular ones, I train to the wall, those which are preserved, in proper regularity and good order, according to their situation, but not nearer to each other than six or eight inches. After the whole tree has been nailed I cover it with a single mat, which remains on until the middle of April, when it is taken off and a net three times folded put in its place. The net is taken away one fold at a time, according to the advance of the foliage and warmth of the weather, and the whole tree is cleared by the latter end of May. If I find during the summer that the leaves are so thick as to exclude the sun from the fruit, I take off a few of them with care, but not so as to admit much reflection from the wall, which would be injurious to the fruit. In removing the leaves I am always mindful to cut the foot-stalks directly under or close to the leaf, that the oozing of the milk may soon dry up.

Experienced Gardeners are well aware that the autumnal fruits will ripen sooner and be larger and better flavoured than those which make their appearance in spring, and by pursuing the practice above recommended, such may be obtained in full perfection.

As it is very desirable to have a regular succession of Figs from August to October inclusive, I cultivate the following sorts, which ripen in the order in which they are named.

1. Brown Ischia - - ripens in the middle of August.
2. Large White Genoa - ripens the end of August.

3.	Green Ischia - - -	ripens the beginning of September.
4.	Murrey, or Brown Naples	ripens the middle of September.
5.	Ford's Seedling - - -	ripens the end of September.
6.	Black Provence - -	ripens the beginning of October.
7.	Yellow Ischia - - -	ripens the middle of October.
8.	Gentile - - -	ripens the end of October.

These are all good kinds; the Murrey, or Brown Naples, will ripen its fruit as a standard in fine summers, as will also the Blue Ischia and Black Genoa, which are not enumerated in the above list, because they are not so certain bearers in all soils.

The Fig I have named Ford's Seedling, is sometimes called the Pocock Fig, and is, I understand, more properly denominated the White Marseilles Fig. The Black Provence Fig I originally found in the Garden at Bookham Grove, near Leatherhead, then belonging to the Honourable MARMADUKE DAWNAY; it is of an oval shape, having a very dark brown skin, and with dark purple flesh; the plant grows vigorously, producing large leaves, and is a tolerably free bearer.

I am, Sir,

Your obedient humble Servant,

SAMUEL SAWYER.

Camberwell,
January 29th, 1823.

L. *On the Cultivation of* Melons in the open air. *In a Letter to the Secretary. By* John Williams, *Esq. Corresponding Member of the Society.*

Read March 4th, 1823.

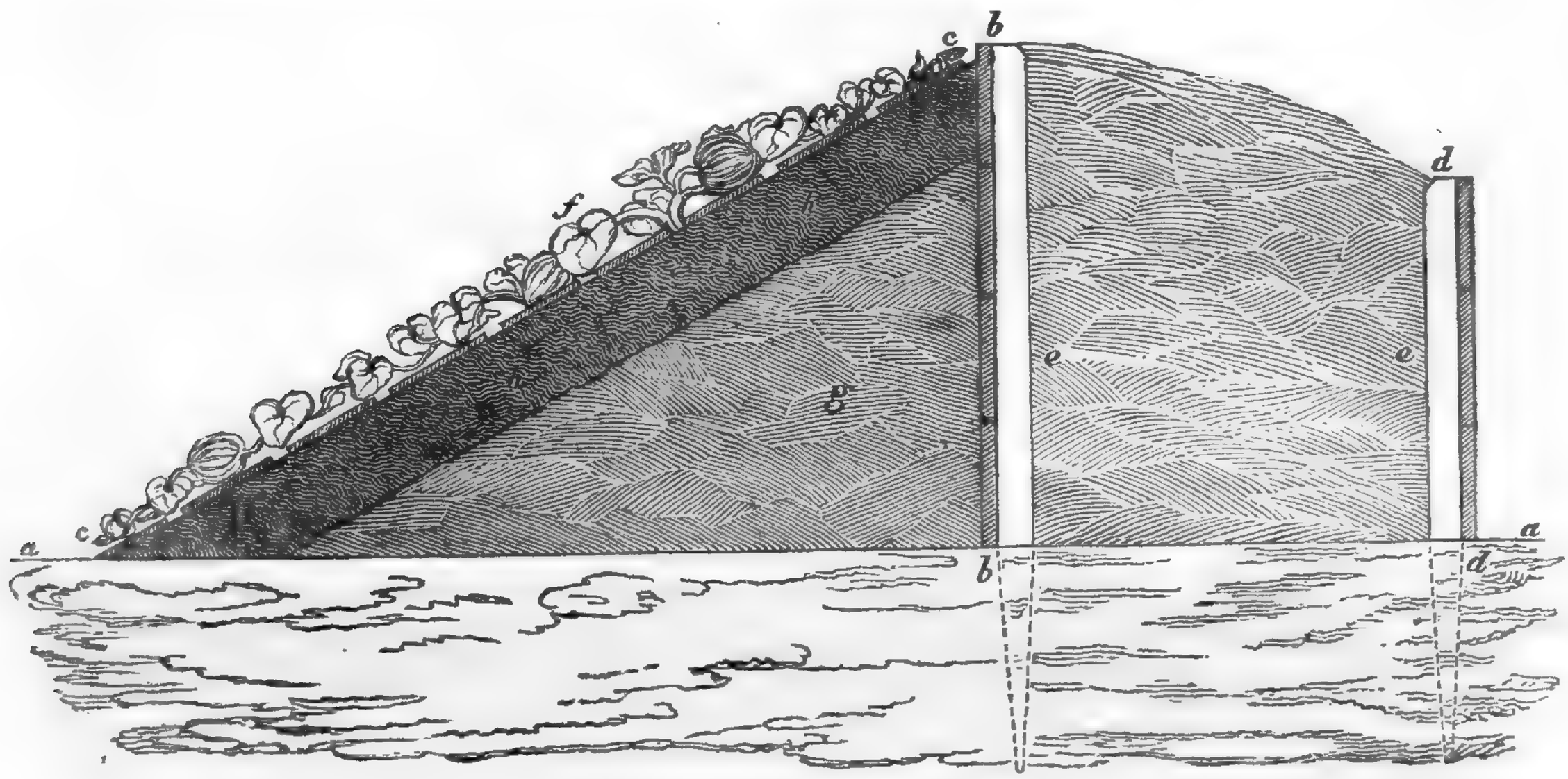
Dear Sir,

According to promise, I send you an account of my method of *growing Melons in the open air*, a practice by no means common in this part of the kingdom, though I believe frequent in the more southern counties.

I have for some years past been trying to give increased hardiness to the Melon, and with this view have made use, every year, of the seed matured in the open air during the preceding summer. The plants have in consequence become so hardy, that in the two last seasons they grew, and the fruit set as well as a common gourd. The whole contrivance for presenting the plant to the solar influence in the most advantageous way, and at the same time giving a little warmth to the roots, does not cost more than a few shillings.

My bed this year is twenty-one feet long; I have already cut fifteen Melons, and my gardener tells me there are upwards of thirty-five more, that will ripen before the plants are killed by the cold.

I send a sketch, with a description, of the bed, which can be easily formed by an ordinary workman.



Scale of half an inch to a foot.

a. a. Level of the ground.

b. b. A row of wooden posts three feet six inches high, to the south face of which boards are nailed.

c. c. Surface of the bed, being an inclined plane fronting the south; covered with slates laid upon the mould, and not over-lapping.

d. d. A second row of posts, two feet six inches high, to which boards are nailed on the north face.

e. e. A space three feet wide extending the whole length of the bed on its north side, filled with mowings of grass, weeds, fallen leaves, and other refuse of the garden.

f. The melon plants covering the surface of the inclined plane.

g. Space filled with old spent bark, trodden hard.

h. h. About nine inches of compost soil laid over the tan for the reception of the Melon plants.

In a bright day I find a thermometer placed in the situation where the fruit is grown, with no more light falling on the bulb than what passes through the leaves, will stand from ten to fifteen degrees higher than another thermometer hung in the shade. It often stands at 85°, and one day in last June, was as high as 95°. Slates answer much better as a covering to the mould than tiles, as they are dry in a few minutes after a shower, and their dark colour absorbs more heat. My situation perhaps has some advantage in having a tall row of elms, which shelter the bed when the wind is in any northerly point, and a cross row of the same trees at a distance also affords shelter from the westerly winds.

When Melon plants are raised for the purpose of being planted on a bed of the above description, in the open air, the pots in which the seeds are sown should never be plunged into a warm dung or tan bed, or the roots exposed to what gardeners call bottom heat; as I find by experience, that when plants so treated are removed into the common ground, if the weather proves cold and wet, their leaves turn yellow, and they afterwards become sickly and continue so a long time. I commonly place the seed pots in March or April near to a warm flue in my grapery, and when the plants are in the rough leaf, the pots are gradually removed to a greater distance from the flue. One plant only should be ultimately left in each pot. About the middle or end of May, according to the state of the weather, the plants are removed into the open air, placing a common hand glass over each. For the first ten days, air is given regularly to harden the leaves. The shoots, as they advance in growth, are carefully pegged down once or twice a week, to prevent the leaves and shoots

being displaced by sudden gusts of wind. The shoots should be spread out so as to expose the leaves as regularly as possible to the light, in the manner of a trained tree; when they are about three feet long their ends are stopped, which forces out laterals with flowers and fruit in abundance. I never give the plants any water after the first ten days, the rain that commonly falls being sufficient to supply the roots with moisture.

I remain, dear Sir,

your obedient servant,

JOHN WILLIAMS.

Pitmaston,
31*st August*, 1822.

LI. *Description of an* improved Pit *for raising Cucumbers, Melons, and other Vegetables,* by the Use of Steam, instead of Stable Dung, &c. *By the Rev.* William Phelps, *A. M. of Mellifont Abbey, near Wells, in Somersetshire.*

Read February 9th, 1822.

The great improvement which has taken place in the science of Horticulture during the last fifty years, is evident from a comparison between the system pursued in the times of Bradley, Miller, and other practical writers on the subject, and the present, in which the most delicious fruits and vegetables, natives of even the tropical climates, are now raised in this country by the aid of glass and artificial heat, equal in perfection to their native state, and in many instances far more highly flavoured.

The cultivation of the Cucumber and Melon has been always considered a test of the gardener's skill, since the peculiar delicacy of these fruits, and their extreme tenderness in the early months of the year, require the most unremitting attention; and as they are principally raised in beds, various have been the plans resorted to, in order to obtain the best material for the supply of heat. Stable dung has been most generally used, and seems to answer the purpose well, but with it, the greatest care is requisite in early forcing, to avoid, in the first instance, the burning of the plants, by the two great fermentation of the dung; and to keep up, by the aid

of linings, a proper temperature in the months of February and March, when cutting winds and heavy rains prevail. These are difficulties well known to every practical gardener, and it is desirable to obviate their inconvenience.

A pit formed upon the plan now recommended, promises a remedy, as the effect of cutting winds and of rain are guarded against by their almost total exclusion, whilst a proper temperature is likewise secured.

Having practically attended to gardening for many years, and having experienced great inconvenience from the want of a sufficient quantity of hot stable dung, for lining my beds, I was induced to consider whether any plan could be devised to answer the purpose of forcing without it: and on attentively examining my bed, which was altered a few years since into a pit,* inclosed on all sides by a wall built chequerwise, with spaces of three inches between the bricks, to allow the circulation of the hot vapour which was raised by banking the bed all round with hot dung, I found this plan was still liable, as in a common bed, to a constant change of temperature from the diminution of heat caused by heavy rains and cold winds. It then occurred to me, as there was no efficacy in the vapour, more than as the medium of raising a moist heat, and as this vapour, if admitted into the bed, was extremely prejudicial to the plants, that steam supplied from a boiler fixed at the end of the pit would answer the purpose, and give a moist heat more uniformly and regularly at all times, than could be possibly obtained from fermenting stable dung.

I therefore closed up the interstices in the outward wall of

* Similar to MACPHAIL's pit.

my pit, and fixed at the end of it a boiler holding forty gallons of water, which was securely enclosed, with the exception of a small aperture, six inches by nine, made to admit the steam into the steam chamber, which encompassed the sides as well as the bottom of the bed. At first, I left an aperture at the opposite extremity of the pit, through which the air escaped when the steam was admitted into the chamber, but this I found unnecessary, and consequently closed it up, and, instead, I used a small metal pipe one inch and a half in diameter, which communicates, with the steam chamber below, and opens into the bed above. In the pipe is a throttle valve, which admits the steam amongst the plants in the upper space, when required. The bed was filled with rich mould, and has succeeded far beyond my fullest expectations.

On the 23rd of February, 1821, the work was completed, and after allowing a week or ten days for the mortar to become hardened, the boiler was filled and the fire applied; in about four days the earth in the bed was warmed to its proper temperature, and so continued through the season. On the 10th of March I sowed the seed, the plants soon came up, and made most vigorous shoots; on the 30th of April I cut my first Cucumber, continuing to cut regularly through the season: and at the time when my neighbours could scarcely keep their beds in a growing state, my plants produced their fruit regularly, and from one bed, four and a half feet broad by ten feet long, I cut upwards of an hundred brace of the finest Cucumbers, thus affording the best proof of the superior advantage of the use of steam in forcing.

I also added a flue of pottery-ware pipes, six inches in diameter, running the whole length of the back of the pit,

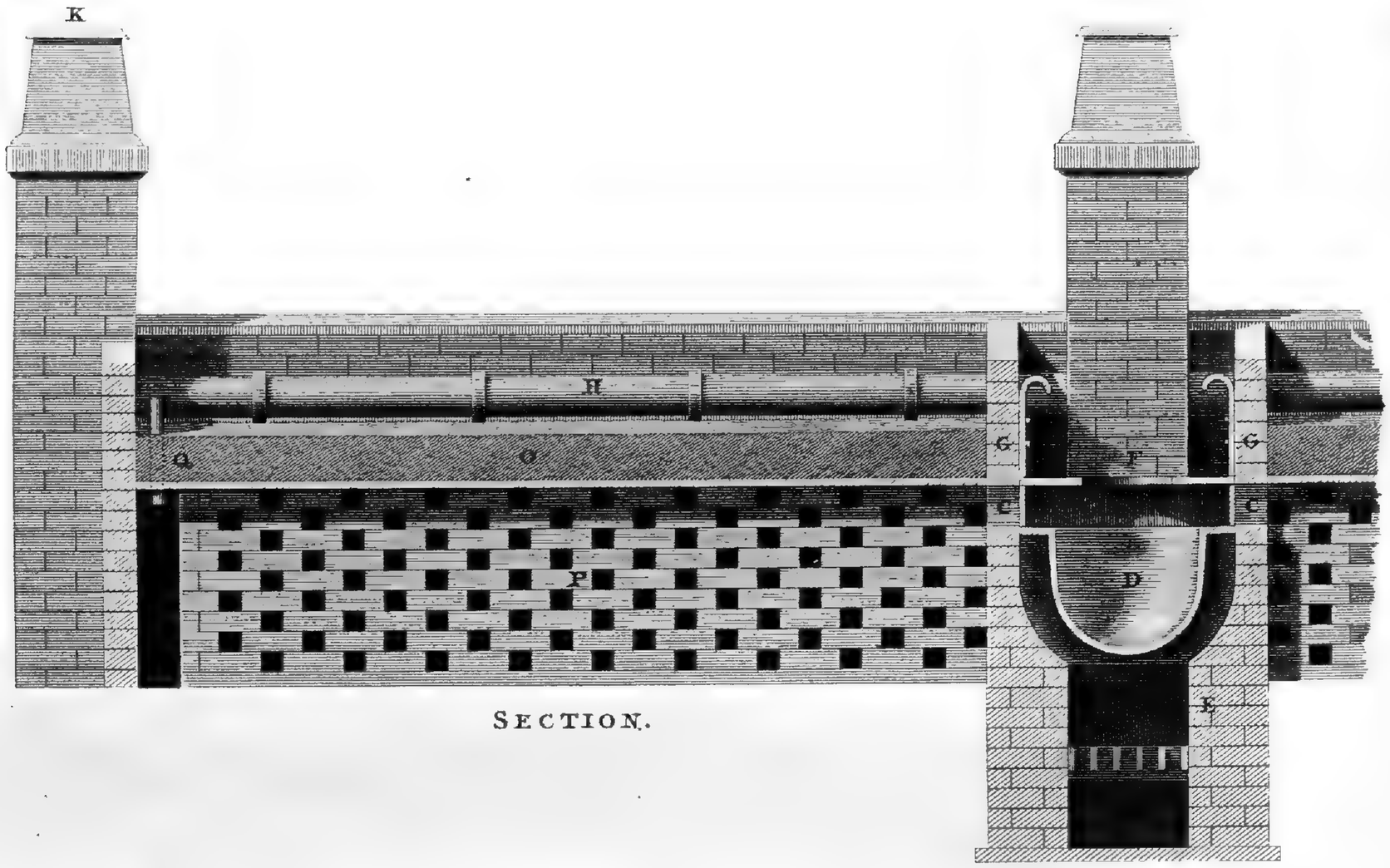
and resting upon a ledge formed for the purpose. By a communication with the fire place, the smoke is turned at pleasure through this flue whenever a damper at the back of the frame is drawn out. The use of this contrivance is to dry up the damp, so often found in forcing beds, at the commencement of the season.

The cost of the whole pit, if new made, would be little more than that of a common pit, and the materials of which it is formed being durable, it is always in readiness for use.

This pit is admirably calculated for preserving tender plants during the winter, or for forcing Roses, Pinks and any other flowers, when it is not used for Cucumbers. Indeed there seems no reason why Pines might not be fruited in it, by filling the bed with tan sufficiently deep to plunge the pots in.

The consumption of coals is upon an average half a bushel daily in the coldest weather, and considerably less as the season advances. The loss of water in boiling is about one fourth in twenty-four hours, and is supplied by a pipe from a cistern, or might be filled by hand as occasion may require. The smoke is carried off into an adjoining chimney.

With the boiler containing, as before stated, forty gallons, I kept two frames in work, the one having four lights, and the other five lights, being together thirty-seven feet long by five feet and a half wide. The boiler might be so placed as to communicate with four frames, if desired.



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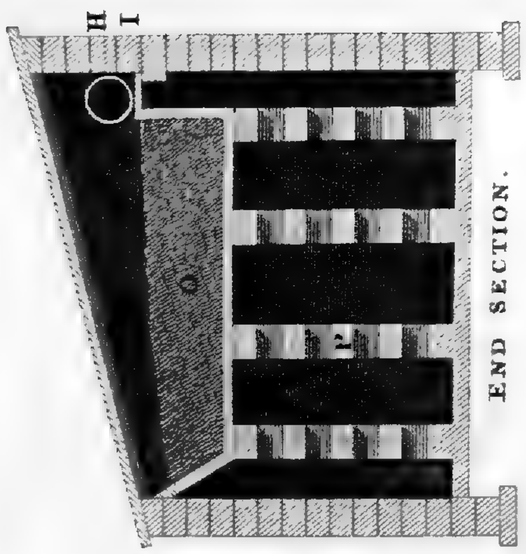
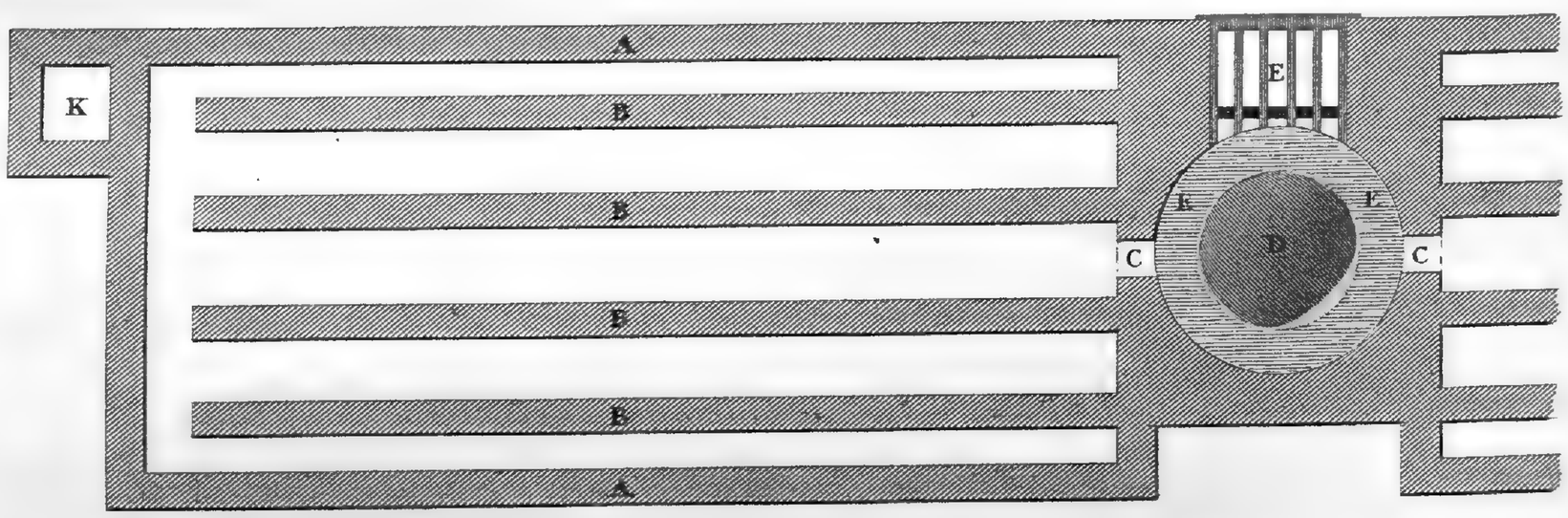
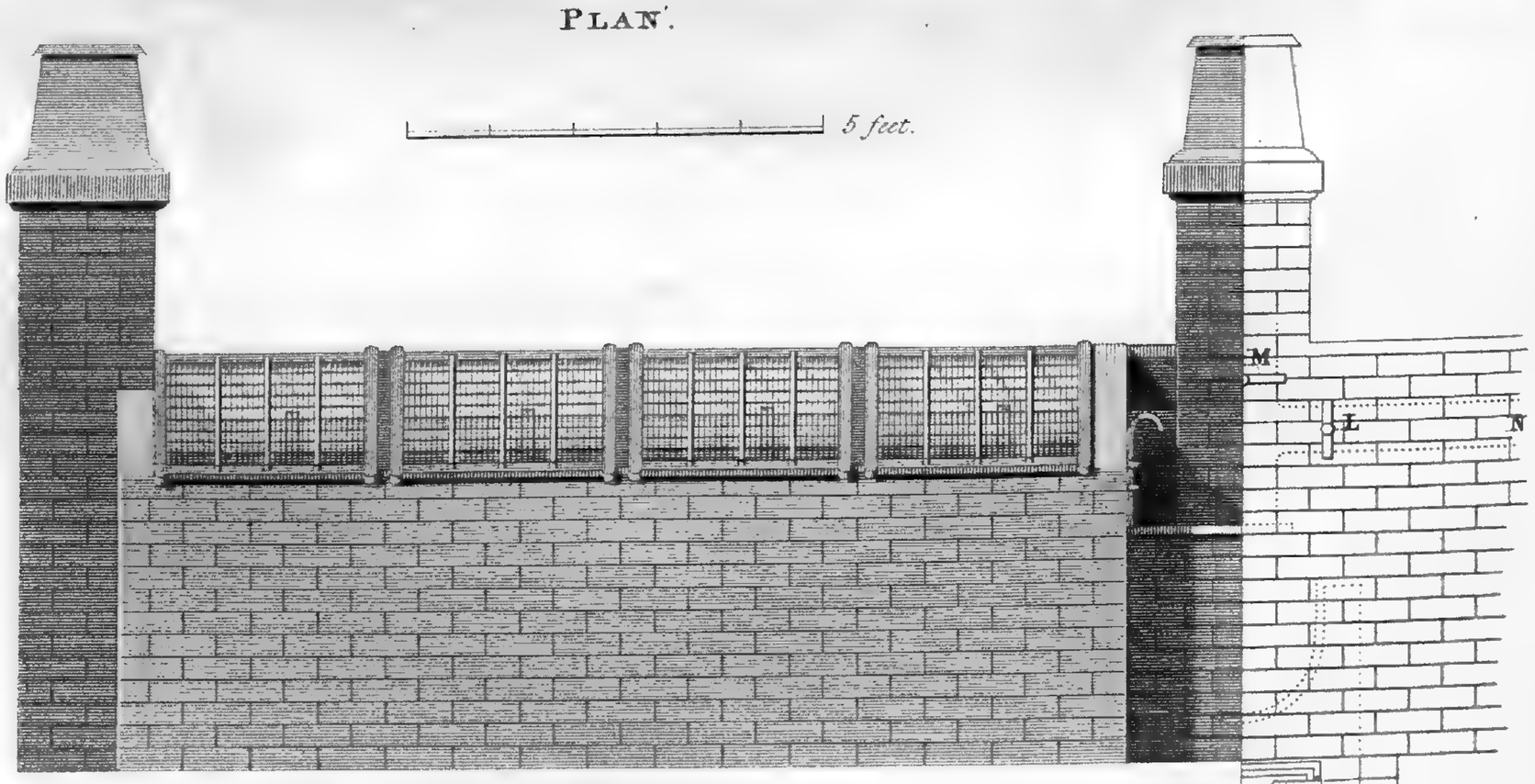




PLAN.



FRONT ELEVATION.

BACK ELEVATION.

Rev.d Mr. Phelps' Steam Pit for Melons, &c.

Engraved by I. B. Taylor.

Reference to the Plate.

A. A. Outside frame of brick-work, laid flat.

B. B. B. B. Walls built chequer-wise, to support the floor of the bed, which is composed of thick slate or stones.

C. C. Steam Holes.

D. Boiler.

E. E. Fire place, and flue which passes under all round the boiler, and returns to a chimney over the fire place.

F. Cover to the boiler, with a hole a foot in diameter to pour in the water in the centre, which is closed by a cover.

G. G. Sliders to shut off the steam from either pit, when it is not wanted.

H. A pipe of pottery (resting on the ledge I,) through which the smoke can be turned, which then escapes by the chimney K, at the end of the pit.

L. Dampers, to open the communication with the pipe H, when required.

M. A Damper in the chimnies, to be pushed in whenever the damper L, is opened.

N. Situation of the earthen pipe shewn in the back view.

O. Earth in the bed.

P. Steam chamber.

Q. Steam valve for admitting steam into the bed above.

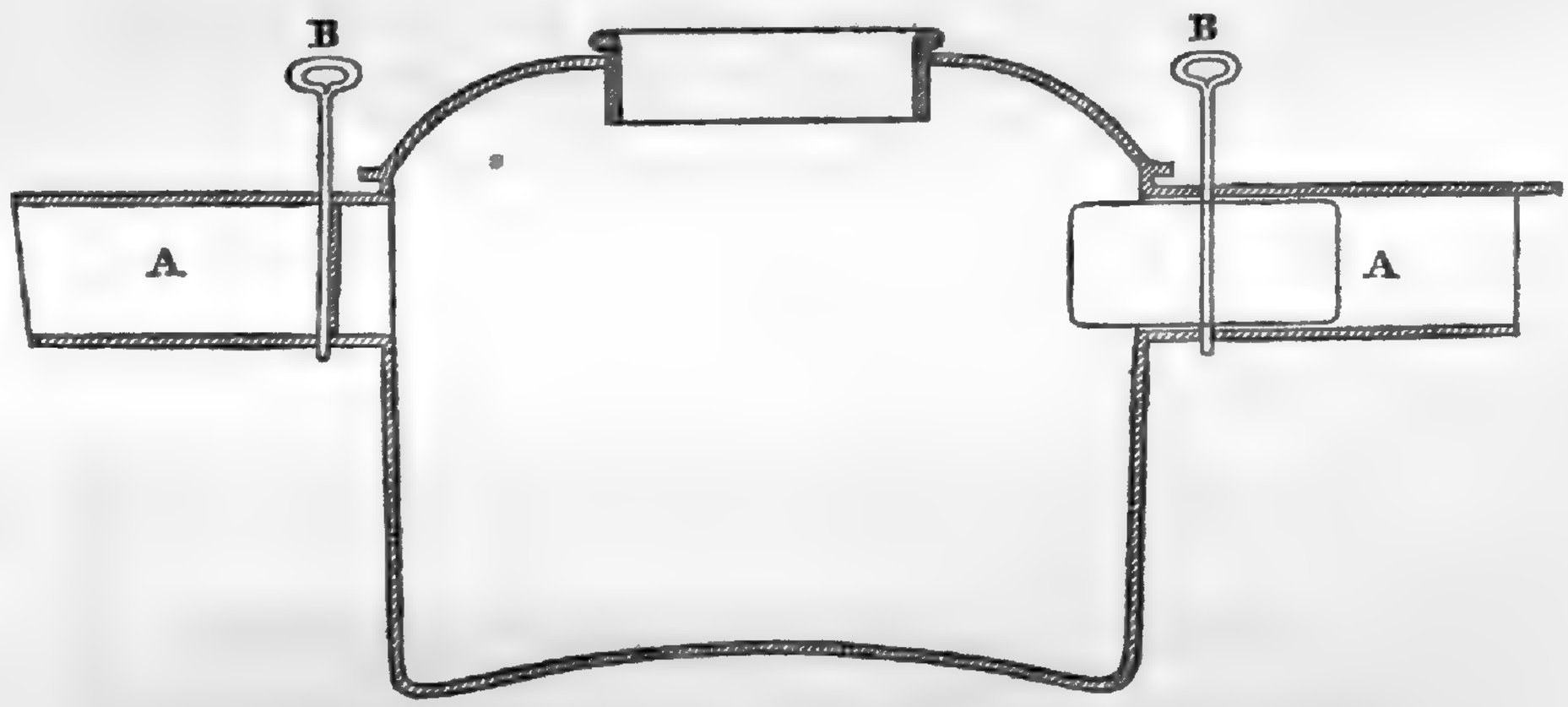
POSTSCRIPT.

July 1, 1823. The experience I have had, fully confirms my opinion of the great utility of these pits, as applicable to various purposes of Horticulture.

I think the form of the boiler may be improved, and would

recommend it to be made of sheet iron or copper (as the heat is more readily transmitted through it than through cast iron) in an oblong square form, two and a half feet wide, and three and a half feet long, with a depth of one and a half foot. The cover may be of cast iron, well fitted to the boiler. The hole in the centre of the cover should be one foot in diameter. The steam is to pass into the chambers through pipes in the upper part of the sides of the boiler A; the pipes may be closed at pleasure with a throttle valve turning on its centre, and having an external handle B.

The annexed section of the proposed boiler will convey a better idea of it than my description.



In this mode of forcing, the gardener's chief care is, not to excite too much steam, as I find a very moderate heat preferable, and more congenial to vegetation. In fact, the steam which arises from water just at the boiling point is the most proper for supplying that moist vapour, which, while it affords a sufficiency of heat, is partially absorbed by the flooring at the bottom of the bed, and communicates a moisture highly beneficial to vegetation; whereas if the steam was raised to a

higher temperature it would dry and parch the earth, and injure the tender fibres of the roots in the bed.

If expense is not a consideration, I should also recommend the floor of the bed to be formed with tiles supported by cast iron rafters, with a rebate on each side to take the edges of the tiles, the rafters to be placed fifteen or eighteen inches apart, in this form,

this will leave the steam chamber an open space; but as bricks may be had where iron rafters could not easily be procured, the original plan may in such cases be adhered to.

My friend WILLIAM HEAVEN, Esq., of Peridge House in my neighbourhood, had two large pits, each thirty-six feet long, and nine feet wide, built upon my plan last year, and the effect has been fully equal to his most sanguine expectations. He cut Cucumbers from them on last New Year's day, and had also a fine dish of young potatoes at the same time. I inspected his pits a week since, and found a second crop of Cucumbers in full bearing; and one of the finest crops of Melons fully ripe. These are confirmations of the utility of the plan. I found his gardener had spread a layer of old tan about six inches deep in the bottom of the bed, and put over it one foot in thickness of rich earth, for the plants to grow in. He had also made a communication between his Pine pit and the boiler, by means of a cast iron pipe, which answers the double purpose of heating and steaming the Pines; this is also useful by taking off a part of the steam, for if the whole was forced into the chamber, it might be too hot for the Melon beds.

The bottom of the boiler should be entirely exposed to the action of the fire, but not the sides or ends; immediately over the part where the steam tube enters the chamber, the floor of the bed should be double, to guard against an excess of heat, directly as the steam issues from the boiler. The cover being of cast iron, its own weight will be sufficient to keep it down, but it should fit so close as not to permit the steam to escape.

LII. *Description of* Amaryllis Psittacinâ-Johnsoni, *a new Hybrid Variety raised by* William Griffin, *Esq., and recently flowered in the Collection at Highclere. In a Letter to the Secretary. By* James Robert Gowen, *Esq. F. H. S.*

Read January 21, 1823.

My dear Sir,

Another *Hybrid Amaryllis* has just come into flower in this collection, possessing such extraordinary beauty, that I have been induced to send the specimen to London, for the inspection of yourself and such Members of the Society as may wish to see it. It was given to Lord Carnarvon by my friend William Griffin, Esq., who raised it in his hothouse at South Lambeth, previous to the year 1820, from seed of Amaryllis Johnsoni, the capsules of which he had impregnated with the pollen of A. Psittacina. The knowledge of its parentage led me to form great expectations of its beauty, and to pay it very particular attention. It has grown rapidly here, and a few days ago produced two scapes, which have just expanded their flowers. My anticipations have been fully equalled, and I think it may fairly be pronounced the most splendid individual of this splendid genus. It bears so great a general resemblance to A. Psittacina, that by a person unacquainted with the circumstances of its origin, it would be taken for a variety (a very splendid one indeed) of that species; but it differs from it in several material points,

which I will endeavour to describe, and I may premise, that my comparison is drawn from a flower of an older and larger bulb of A. Psittacina, which expanded on the same day with the hybrid.

The corolla of the hybrid Amaryllis Psittacinâ-Johnsoni, is nearly an inch longer than that of A. Psittacina; it expands about an inch wider. The upper lacinia of the corolla of A. Psittacina assumes a horizontal position; in the hybrid it is inclined upwards. and the laceniæ are altogether more regularly and widely expanded, so that the flower shews itself more advantageously. The faucial membrane of A. Psittacina is minutely denticulated; in the hybrid it is conspicuously bearded. But the superior beauty of the hybrid is to be found in its colouring; in A. Psittacina the crimson tint is confined almost entirely to a small terminal portion of the petals, and a few small streaks proceeding thence. In the hybrid, it is not only of a richer quality of colour, but occupies a much larger space, being diffused over the whole margin of the laciniæ, besides a most delicate pencilling of the same fine colour, which is streaked over the greater part of their surface with an inimitable richness of effect, which is much enhanced by a cream-coloured stripe proceeding from the central green mass, and prolonged to their tips. But it is so difficult to convey in words an adequate idea of the complicated colouring of the flower, that I must refer you to actual inspection of it. It only remains to me to add that the foliage differs materially, as might be expected, from that of its parents, but approximates more nearly to the male than to the female parent. The leaves are rather broader than those of A. Psittacina: they are of a lucid and somewhat dark

green, not having the slightest trace of that glaucous hue so conspicuous in the foliage of that plant; they are also tinged with brown towards their points, and diverge at once from the bulb, instead of being produced into a leek-shaped neck, as is the case in A. Psittacina. The bulb will increase faster than that of A. Psittacina, but it does not appear so much disposed to make offsets as the hybrids derived from A. rutila, in which that propensity is so strong, as to be inconvenient.

I have no doubt that the bulb will grow to a considerable size, that it will be very free in flowering, and that the next blossoms will be larger. I think you will allow that its extraordinary beauty renders it one of the greatest ornaments of our collections. As it grows older it may be expected to produce four flowers on a scape. I have heard that A. Psittacina has done so in the Liverpool Garden, and I have often seen four on a scape of A. Johnsoni.

I am, dear Sir,

Your's most sincerely,

James Robert Gowen.

Highclere, near Newbury,
January 18, 1823.

Note by the Secretary.

On the 15th of July, 1823, Mr. Griffin sent to the Garden of the Society two plants of Amaryllis Psittacinâ-Johnsoni, which had been produced at the same time, and from the same parents and impregnation, as the bulb, which has

been noticed and described by Mr. Gowen in the above Paper. The plants sent by Mr. Griffin were in full flower, and were exhibited at the Meeting of the Society, on the day they were received. The blossoms, though very beautiful, were by no means so splendid as those described by Mr. Gowen, and this difference is thus accounted for by Mr. Griffin, in a letter which accompanied the plants: "In a family of seedling mule Amaryllis you will find a marked distinction between the plants. Some of them having the stronger resemblance to the father, and others to the mother plant. There are also other varieties partaking in some degree of both; both these variations are trivial, and never sufficient to destroy the leading distinction of parental resemblance; therefore, no one description can ever answer for a whole family of seedling mule plants of Amaryllis. I send you two plants from the same batch of seed as the plant described was raised from. These will exemplify what I say. They are weak plants, but such as they are, they are at the Society's service. I have only to add, that the foliage of some of my seedlings is glaucous, and some of the bulbs have a leek-shaped neck, though not so much as A. Psittacina."

LIII. *Description of a* Method of protecting Cauliflower, and other tender Plants, during Winter. *In a Letter to the Secretary. By Mr.* James Drummond, *C. M. H. S.*

Read May 20, 1823.

Sir,

My success for several years past in *protecting Cauliflower plants, in earthern pits, from frost and snow, during winter,* by means of wooden frames covered permanently with straw, induces me to send an account of the plan to the Horticultural Society.

My pits are mostly made in a south and east border, in an inclosure, or yard which I have for hot beds, composts, &c. the fences of which afford good shelter from the cold quarters. To form the pits I first make the ground as level as I can, and as firm as possible, by trampling in wet weather, I then cut them out ten feet in length by four in breadth, making the sides and ends as firm as possible by beating the soil when wet with the spade. The depth of the pit is according to the description of plants to be kept in them. Nine inches is sufficient for Cauliflower plants, and for these care must be taken that a sufficient quantity of proper soil is left, or placed, in the bottom of the pit in which they are to be pricked out. Each pit of the above dimensions holds about four hundred Cauliflower plants. For plants in pots the depth of the pits must be proportioned to the height of the plants, the tops of which must, when

placed in the pits, be below the level of the surface of the ground.

The frames proper to cover these pits are twelve feet in length by six in breadth; I prefer them of that, to a larger size, for such can be conveniently carried where wanted between two men, and can be easily opened and shut, to give light and air to the pits, by a single person.

The timbers to form the sides and ends of the frames are required to be about three inches square, and quite straight. These, when joined together, are placed on a level floor, and slips of timber two inches in breadth and one in thickness, are nailed lengthways on them at intervals of nine inches. When the timber work is finished, the straw is fastened on in layers in the manner of thatch, and tied to the bars by rope yarn. The straw used is what is called in this country *reed;* it is prepared by taking the wheat in handfulls out of the sheaf, and beating it against a door firmly fixed on edge; by this method of threshing, the straw is very little bruised except at the points, and is consequently preferred for thatching.

The frames are always kept under shelter in summer, being perfectly dried before they are put up, and with proper care will last for several years.

When the plants are put into the pits the frames are laid over them. My method of giving air, is by placing in the ground, near the centre of each pit, a forked stick about four feet or more in length, strong enough to support the frames when raised like the lid of a box, to a sufficient height, and they remain in that position night and day, unless when

actual freezing takes place, or when frost is expected in the night.

I am far from thinking that these straw frames will bear a comparison with glass, for neatness of appearance; but they have other advantages besides their cheapness: when they are raised, the plants in the pits have the full advantage of air and sun, and are but little exposed to wet, the rain being mostly thrown off on the back of the frames, and when they are shut down, frost cannot easily penetrate through them to the plants.

It is well known that it is necessary to have mats and other sorts of coverings over glass in severe weather, the removing of which to give air in the middle of the day, and replacing at night, is attended with much trouble; whereas the opening and shutting of the straw frames is but the work of a moment.

I have principally used these pits and frames for the protection of Alpine and other plants usually kept under glass without fire heat; but in cases of necessity tender green-house plants may be preserved through the winter in them, as I experienced last season. I had many Geraniums and other tender plants which I could not find room for in the glass houses. By way of experiment I placed them in these pits; and although from the unusual severity of the winter, I was obliged to keep down the frames night and day for a fortnight together, and cover them with additional straw to exclude the severe frost, the only plants that suffered were a few of the downy-leaved Geraniums, and even those, on being planted afterwards in the ground, shot out vigorously

in the spring at every joint. I have often tried to keep Geraniums in hot-bed frames through the winter, but could never succeed, if the weather was severe.

I am, Sir,

your very obedient servant.

James Drummond.

Botanic Garden, Cork,
May 12, 1823.

LIV. *On the Cultivation of the* Yellow Rose, *and of the* tender Chinese Roses, *by budding on the Musk Cluster Rose. In a Letter to the Secretary. By* John Williams, *Esq. Corresponding Member of the Society.*

Read July 13th, 1823.

Dear Sir,

Mr. Knight spent a day with me lately, on his return from London, and was so much pleased with the appearance of some Roses, trained on the front of my house, that he wished me to mention the circumstance to you.

The *Double Yellow Rose* does not flower with me as a standard bush, in fact it does not blossom well except in certain situations and soils. Three years ago I had buds of this Rose as well as some of the dark and of the sweet-scented Chinese Roses, inserted on strong shoots of a Musk Cluster Rose, which is trained on the east front of my house. Last year, both of the Chinese varieties flowered in great beauty during the whole of the season; a few blossoms of the Yellow Rose, also opened very finely. This year the latter produced many buds, several became perfect flowers, and I think all would have opened, had it not been for the unusual coldness of the spring, and the attacks of Aphides. The dark Chinese Rose succeeds particularly well, the flowers are much larger than when grown on its own roots. In fact, my Roses have been the admiration of every person who has seen them.

As the budding season is now approaching I mention this to you, that you may try how far the Yellow Rose so treated, will thrive in the Garden of the Horticultural Society at Chiswick. I expect it will succeed particularly well, as it grows best in deep alluvial loams on the banks of rivers. My buds were inserted ten feet from the ground, and Mr. KNIGHT thinks the large size of the blossoms of the dark Chinese Rose is owing to the distance the sap has to pass from the root before it reaches the flower buds.

I remain, DEAR SIR,

your's truly,

JOHN WILLIAMS.

Pitmaston, near Worcester,
29th June, 1823.

Note by the Secretary.

The Society, at its Meeting on the 1st of July, had an opportunity of witnessing the result of another successful experiment on the Double Yellow Rose.

THOMAS CAREY PALMER, Esq. of Bromley, sent specimens of its flowers in a very perfect state, and fully expanded, These were gathered from branches produced from a bud inserted on a strong plant of the common Chinese Rose growing against a wall with a western aspect. The operation had been performed in April 1822, with a spring bud having a little of the wood attached to it; it had grown so vigorously as to produce upwards of thirty flower-buds in the present season, part of which were taken off to prevent the exhaus-

tion of the plant; some of the remainder were those exhibited. Mr. Palmer prefers the spring for the insertion of the buds, having been more successful at that time than at Midsummer. The result of this experiment is very important, since the Double Yellow Rose will not live on its own roots in Mr. Palmer's garden.

LV. *On the Cultivation* of the Arachis hypogæa. *In a Letter to the Secretary. By Mr.* John Newman, *Gardener to the Hon.* Robert Fulk Greville, *F. H. S.*

Read August 17th, 1823.

Sir,

I beg leave to lay before the Horticultural Society a few remarks on the cultivation of the *Arachis hypogæa,* and hope, though trifling, that they may not be uninteresting.

The Arachis hypogæa, though often introduced into this country, has seldom produced any seeds. To those gentlemen who are fond of cultivating tropical fruits, it may probably be worth knowing, that if the seeds be sown singly in pots (in a stove in February), and the plants when advanced in growth to about six inches in height, turned out into the tan-pit of a pine stove, just after the Pines have been shifted, a little below the surface of the tan, close to the curb of the pit, they will form a beautiful edging, and not injure the Pines, as they seldom grow more than a foot in height. They should be taken up in the autumn, and the pods washed and dried in the shade.

I have cultivated the Arachis hypogæa with great success in the pine stoves, at Castle Hall, gathering from twenty to thirty pods from each plant; and when dried, the seeds have been found to possess nearly the same qualities as those grown in tropical countries. I need not add, that they are cultivated abroad to a great extent for food. There are but few in-

stances in plants, wherein nature has been more singularly wonderful in her operations than in the means which she has given this humble plant for the preservation of its seed pods.

I subscribe myself

your obliged and very humble Servant,

JOHN NEWMAN.

Castle Hall, near Milford, South Wales,
June 25, 1823.

LVI. *On the Treatment of the* Banyan *Tree* (*Ficus Indica*) *in the Conservatory. In a Letter to the Secretary. By* Peter Rainier, *Esq. Captain R. N. F. H. S.*

Read January 20th, 1824.

Dear Sir,

I have in my conservatory a *Banyan* Tree, which has been in my possession fourteen years; but I did not succeed in getting the roots, which it annually sends forth from its branches, to form stems, and live through the winter, till 1820; previous to that year they mildewed in consequence of being exposed to the steam of the house.

I have now been more successful under the following treatment:—in the summer of 1820, I procured some rocket cases, which were filled with equal parts of white sand and sifted loam, well mixed together, and then suspended from the tree; into these the fibres were inserted which had shot from the different branches to the length of four or five inches; water was occasionally applied to them till the end of October, from which time till the ensuing spring they remained dry. The bottoms of the cases were opened in the May following, and the roots soon projected, the cases were then taken off, with a sharp knife, and the operation again repeated on the extremities of the same roots, till they were long enough to touch the earth in which the tree is growing. Soon after the roots which had been enclosed were exposed to the atmospheric air, they were covered with bark, and

attained the size of a quill the first year. My Banyan tree has now thirteen stems, and is the only one I have seen in this country exhibiting its native character. I have sent you this statement, thinking it may be acceptable to some Members of the Society.

I am, dear Sir,

your's faithfully,

PETER RAINIER.

Southampton,
19*th January,* 1824.

LVII. *Further Notes on the Utility of the* Grafting Wax, *described in a former Paper.** *In a Letter to* Charles Holford, *Esq. F. H. S. By* David Powell, *Esq. Communicated by Mr.* Holford.

Read November 4th, 1823.

My dear Sir,

I have sent you herewith two of last year's grafts, which will shew the efficacy of my method of applying the *grafting wax,* described in a former communication: It will also shew (what I was not aware of when you were so good as to forward my prior letter to the Society), that this application alone is sufficient to sustain the scion in its place, without any other ligature whatever. This I consider a very strong additional recommendation, as saving to the practitioner a great portion of time, and reducing the operation of grafting to its greatest simplicity. Should you see this circumstance in the same view, perhaps you will be good enough to forward this notice for the information of the Horticultural Society. The grafts are two out of above twenty which succeeded last year, all done in the same manner; of those which failed, I could not in any instance impute the failure to the inefficiency of the adhesive grafting plaister.

I remain, dear Sir,

your's sincerely,

David Powell.

Loughton, Essex,
29th October, 1823.

* See page 284 of this Volume.

LVIII. *Some Remarks on the* supposed Influence of the Pollen, in cross breeding, *upon the Colour of the Seed-coats of Plants, and the Qualities of their Fruits. By* THOMAS ANDREW KNIGHT, *Esq. F. R. S., &c. President.*

Read June 3, 1823.

It has been long ago ascertained by physiologists, that the seed-coats, or membranes which cover the cotyledons of the seeds of plants, with the receptacles which contain such seed-coats, are visible some time before the blossoms acquire their full growth; and the existence of these organs is, therefore, obviously independant of the influence of the pollen upon the growth of the internal and essential parts of the future seeds. The seed-coats also, and the fruit of some species of plants, acquire nearly, if not wholly, their perfect growth when the pollen has been intirely withheld, or when, from other causes, it has not operated; and from these circumstances, and other observations, it has been inferred, that neither the external cover of the seeds, nor the form, taste, or flavour of fruits, are affected by the influence of the pollen of a plant of a different variety or species. There exists, however, some difference of opinion upon these points; and the experiments of Mr. Goss upon the Pea, of which an account is given in a Paper recently printed in the *Transactions of the Horticultural Society,** appear strongly to countenance the

* See page 234 of this Volume.

opinion, that the colour of the seed-coats at least, may be changed by the influence of the pollen of a variety of a different character; and hence he infers, with apparent reason, the probability that the taste and flavour of fruits may be also affected.

The narrative of Mr. Goss is unquestionably quite correct; but I believe that there is an error in the inference which he has drawn; and I am anxious that such error, if it exist, should be pointed out; because it may occasion many experiments to be made to prove that, which I conceive to have been already sufficiently proved; and, consequently, cause the useless expenditure of time and labour, which might be advantageously employed in similar investigations upon other plants in the wide and unexplored field which lies open to the experimental Horticulturist.

The numerous varieties of strictly permanent habits of the Pea, its annual life, and the distinct character in form, size, and colour of many of its varieties, induced me, many years ago, to select it for the purpose of ascertaining, by a long course of experiments, the effects of introducing the pollen of one variety into the prepared blossoms of another. My chief object in these experiments was to obtain such information as would enable me to calculate the probable effects of similar operations upon other species of plants; and I believe it would not be easy to suggest an experiment of cross breeding upon this plant, of which I have not seen the result, through many successive generations. I shall, therefore, proceed to give a concise account of some of these experiments, or rather (as I wish not to occupy more than necessary of the time of the Society), to state the results of a few of them, believing that I shall be able to explain satisfactorily,

the cause of a coloured variety of the Pea having been apparently changed into a white variety, by the immediate influence of the pollen in the experiment of Mr. Goss.

When, in my experiments, the pollen of a gray Pea was introduced into the prepared blossoms of a white variety, no change whatever took place in the form, or colour, or size, of the seeds; all were white, and externally quite similar to others which had been produced by the unmutilated blossoms of the same plant. But these when sown in the following year, uniformly afforded plants with coloured leaves and stems, and purple flowers; and these produced gray Peas only. When the stamens of the plants which sprang from such gray Peas were extracted, and the pollen of a white variety, of permanent habits, was introduced, the seeds produced were uniformly gray; but many of these afforded plants with perfectly green leaves and stems, and with white flowers, succeeded, of course, by white seed. In these experiments the cotyledons of all the varieties of Peas employed or produced were yellow; and, consequently, the Peas with white seed-coats retained their ordinary colour, though they contained the plumules and cotyledons of coloured Pea plants. The cotyledons of the Blue Prussian Pea, which was the subject of Mr. Goss's experiments, are, on the contrary, blue; and the colour of these being perceptible through the semi-transparent seed-coats, occasioned those to appear blue, though they are really white; the whole habits of that plant are those of a white Pea. The colour of the cotyledons only were, I therefore conceive, changed; whilst the seed-coatsretained their primary degree of whiteness. I must consequently

venture to conclude, that the opinions of Mr. SALISBURY, quoted by Mr. Goss, which have also very long been mine, viz. that neither the colour of the seed-coats, nor the form, taste, or flavour of fruits, are ever affected by the immediate influence of the pollen of a plant of another variety or species, are well-founded.

I need not add, that Mr. SETON's experiment mentioned in the note to Mr. Goss's Paper, is also most perfectly accurate; though the results differed from those obtained by Mr. Goss, owing, I imagine, to the greater permanence of colour in the cotyledons of the Green Imperial Pea, which was the subject of his experiments.

LIX. *An Account of a* New Variety of Plum, *called the* Downton Imperatrice. *In a Letter to the Secretary. By* Thomas Andrew Knight, *Esq., F. R. S., &c. President.*

Read December 2, 1823.

My dear Sir,

I send you a few *Plums* of a new variety, which I have obtained from seed in the present year, and which possesses peculiar, and, I think, valuable properties. The period of their maturity in the past autumn, upon a south-east wall, was the latter end of September; but the greater part of the crop remained upon the tree till the second week in November, without a single fruit having fallen off, or decayed; though several have been slightly wounded by insects. At that period, owing to some rather severe frosty nights having occurred, they were brought into the house, where all remain as perfect as the sample you receive.

This variety sprang from a seed of the White Magnum Bonum Plum, and the pollen of the Blue Imperatrice, from which varieties I propagated on account of having previously observed the fruit of the seedling offspring of the White Magnum Bonum Plum to shrivel upon the trees, and dry, without falling off; and I thence inferred the practicability of obtaining, with the Pollen of the Imperatrice, a large and late Plum with the firm flesh of the Imperatrice, and the habits of the seedling offspring of the Magnum Bonum. I anticipated a thick and tough skin, such as I had noticed in

the seedling offspring of the Magnum Bonum Plum: but I did not think such a skin objectionable, on account of its beneficial operation in defending the flesh both from weather and insects: and the merits of a large Plum, such as Coe's Golden Drop, when it has hung to shrivel upon the tree, are not much diminished by the strength of the skin. The Plum you receive is in many respects such as I hoped to obtain: and it appears capable of retaining its soundness very long, under proper management; though its skin is extremely thin and delicate.

I have every reason to believe, that the variety will prove exuberantly productive; for all the blossoms of the seedling tree set, and the crop was so great, that I gave the gardener orders to cut off at least three fourths of it; and the blossoms of the next spring will be extremely profuse. I do not entertain any doubt of the fruit being produced abundantly by standard trees; and I think it will afford an excellent conserve, its pulp possessing a degree of firmness, though it is very succulent, and its skin being free from any unpleasant taste.

The first fruit of every young seedling tree being of much smaller size, than either it, or the grafts taken from it, will subsequently produce, you will consider the sample sent as very imperfect. I believe the future fruit will acquire double the weight of that you receive. Its juice will also become much more saccharine; and the fruit, I conclude, will in consequence be capable of being longer preserved.

I remain,
my dear Sir, sincerely your's,
THOMAS ANDREW KNIGHT.

Downton, near Ludlow,
December 1, 1823.

Note by the Secretary.

The Plums received from Mr. KNIGHT, on the 2d of December, were of the shape of the Blue Imperatrice, but larger, and not so much lengthened at the stalk end. The skin was of a dull yellow colour, and very thin. The flesh was yellow, soft, juicy, with a high flavoured rich acidity. The stone was small, flat, oval, blunt at the end. All these are characters indicating much excellence. The name of *Downton Imperatrice,* which has been given to it, designates the place of its origin, as well as the general character of the fruit.

LX. *Observations upon* the Effects of Age upon Fruit Trees *of different Kinds; with an Account of some new Varieties of Nectarines. In a Letter to the Secretary. By* Thomas Andrew Knight, *Esq. F. R. S. &c. President.*

Read March 2, 1824.

My dear Sir,

Many *new Varieties of Fruits* of different species having been sent from my garden to the Horticultural Society in the last and in preceding seasons, and some others having been seen by you in the short visit which I had the pleasure to receive from you in the last autumn, I feel desirous to offer a few observations upon the expediency of obtaining such productions; or rather, upon the question, whether each variety have its period of youth, of maturity, and of old age, and be formed for a limited period of duration only; or whether each be capable of eternal propagation, with undiminished health and vigour.

The fact, that certain varieties of some species of fruits which have been long cultivated, cannot now be made to grow in the same soils, and under the same mode of management, which was, a century ago, perfectly successful, is placed beyond the reach of controversy. Every experiment which seemed to afford the slightest prospect of success, was tried by myself and others, to propagate the old varieties of the Apple and Pear, which formerly constituted the orchards

of Herefordshire, without a single healthy, or efficient tree having been obtained; and, I believe, all attempts to propagate those varieties have, during some years, wholly ceased to be made. I have detailed in the *Philosophical Transactions,** an account of some experiments, which I repeated, with the hope of being able to ascertain which, amongst the various organs of trees of aged varieties, first fail to execute their proper functions; and I came to the conclusion, upon the following, and other evidence, that it is the leaf. Having obtained by layers or cuttings, small plants of several of the most diseased of the old varieties of the Apple, these were grafted within a couple of inches of the surface of the soil with scions of new seedling and luxuriant varieties; and under these circumstances the roots of the most debilitated and diseased varieties executed their office perfectly well, and were found, upon examination, at the end of several years, wholly free from every symptom of disease. This process was reversed, and scions of old varieties were employed as grafts; but into the young growing shoots, which sprang from these, many buds of new and luxuriant varieties were inserted, and in the autumn every natural bud of the old varieties was destroyed. The inserted buds vegetated in the following spring, and by these efficient foliage was given; when every symptom of debility and disease disappeared, and the wood and bark of the most exhausted and diseased varieties now constitute a part of the stems of large Apple trees, and present, at the end of thirty years, as much apparent health as other parts of the stems of those trees. From these results I have inferred, that the debility and diseases of such old varieties arise from

* For the year 1810. page 178.

the want of a properly prepared circulating fluid; and that when such is given by efficient foliage, the bark of the most debilitated variety possesses the power to occasion the necessary secretions to take place, and the alburnum is enabled to execute all its offices.

It has been urged against the conclusion, that old age is the cause of debility and decay of those varieties of fruit which have been very long cultivated, that many of the seedling offspring of such varieties are as much diseased as their parents; and it is contended, that the failure of our best old varieties of fruit has arisen from a succession of unfavourable seasons. The fact, that many of the seedling offspring of old diseased varieties of fruit are as much diseased as the parents from which they spring is unquestionable; but this I conceive, proves nothing more than that diseases are hereditary in the vegetable as they are in the animal world; and, it is scarcely reasonable to expect, that healthy and robust offspring can be obtained from parents, whose lives have been extended beyond their natural periods by preternatural means, and whose bodies are yearly falling to pieces under the operation of disease; and in which the whole of the circulating fluids are in a morbid state.

If a deterioration have taken place in our climate, and this have occasioned the decay of our fruit trees, at what period did this deterioration take place? It is more than forty years since I commenced experiments with the hope of being able to raise healthy trees of the old varieties of the Cider Fruits of Herefordshire; and I know that the progressive debility of those had been pointed out some years before my birth by my father, who died an old man when I was an infant; and who was an extremely competent judge of the subject.

PARKINSON also, who lived in the reign of ELIZABETH, complains of the unfavourable seasons in the latter part of his life. The grapes did not then ripen as they had formerly done; or more probably, I believe, he did not find them so sweet as he thought them when he was a schoolboy. That some change may, however, have taken place in our climate, owing to the operation of many concurrent causes, is not improbable, but not in a degree equivalent to the effects produced. Any considerable change of climate must also have affected alike the new and the old varieties of fruits, and the decay of the latter alone seems therefore to prove some constitutional change to have taken place in those.

If the leaf gradually fail to execute properly its office, a progressive degree of debility, preceding a state of disease and decay, must necessarily follow; and this I have noticed in some moderately old varieties of the Apple and Pear. They remain free from disease; they blossom frequently, and sometimes freely; but they rarely afford much fruit; and their recovery, from the exhausted state, in which even a moderate crop of fruit leaves them, is very slow. If this state be induced, as I am well satisfied that it is, by the inefficient operation of the foliage; it becomes an interesting question at what period of the age of each variety such defective operation commences. The observations, which I have had opportunities of making, lead me to believe that it commences at the period when the original tree becomes, according to the ordinary course of nature, debilitated by age; and I suspect that much the greater part of the varieties of fruit, of different species, which are now named in the catalogues of Nurserymen, have already outlived the periods, at

which they best deserved the attention of the planter. This remark I wish particularly to apply to the Peach and Nectarine; varieties of which, of equal excellence, and much superior vigour and hardiness, may be easily obtained from seeds ripened in the forcing houses, if not upon the open walls, of our gardens. I sent to you in the last autumn, many new varieties of Nectarines, raised in my Peach house from seeds of the Elruge, and the pollen of the Early Violet Nectarine. They were the produce of buds inserted into the bearing branches of old Peach and Nectarine trees, growing upon my walls, the original seedling trees not having been retained in my garden.

Every attention was paid to make the fruit from which the seeds were taken, attain the highest state of perfection, and the crop of fruit of the trees which bore them, and from which the pollen was taken, was sacrificed almost wholly in the preceding season, that both those might be in the most efficient and vigorous state; and I preferred the forcing house to the open wall, that the wood and blossoms might attain the most perfect state of maturity. Of the merits of the Nectarines you received, I wish to decline giving an opinion; and I shall therefore only remark, that in every unfavourable season, such as the last, the stones are always found larger, relatively to the bulk of the fruit, than in favourable seasons. But of the habits of the trees, or rather of the branches (for few of the trees have been preserved) I can speak with much satisfaction. The wood of many has ripened more perfectly, and offers a much stronger and more abundant blossom than is found on any of the branches of the parent varieties; and I feel perfectly confident that some of

the new varieties, and particularly one of them will succeed in forming blossoms, and ripening fruit in seasons and situations too cold for either of the old varieties, from which they sprang.

Buds of any of the varieties, which you may think deserving cul ture, shall be sent in the proper season. Having preserved and given a place to the original tree upon my wall of one (which I believe you agreed with me in thinking the best, and to which you proposed to give the name of the *Downton Nectarine*) I shall be able to supply a much larger number of buds of that, than can be wanted.

I remain,

my dear Sir, sincerely yours,

THOMAS ANDREW KNIGHT.

Downton,
28th February, 1824.

Note by the Secretary.

April 17, 1824.—Mr. WILLIAM CHRISTIE, the Fruit and Kitchen Gardener of the Society, having been at Downton during part of the last week, was much struck with the appearance of the blossoms of the New Nectarines, mentioned by the President in the above paper; they were particularly plump and strong, and their colour very bright and lively, all indicating vigour of constitution in the branches producing them.

LXI. *On a* Hybrid Amaryllis, *produced between* Amaryllis vittata *and* Amaryllis Reginâ-vittata. *In a Letter to the Secretary. By* James Robert Gowen, *Esq. F. H. S.*

Read May 21st, 1823.

Dear Sir,

In my Paper on the Hybrid Amaryllis Reginâ-vittata, published in the *Transactions of the Horticultural Society,** in which the identity of the above-mentioned hybrid with the Amaryllis Johnsoni of the gardens is (I apprehend) established, beyond controversy; I observed that it was a fertile hybrid, being a free seeder, either by self-impregnation, or by the insertion of the pollen of other species, and that I had raised a dozen seedlings from Amaryllis vittata, impregnated by it, which would be three-fourths of A. vittata, and one-fourth of A. Reginæ. These seedlings were raised late in 1819, and several of them have flowered here this spring. I waited for their flowering with much curiosity, and have been gratified with the result of my experiment, which has terminated in the production of some very splendid flowers. One of the bulbs having been sent to you, for your own inspection, and that of such Members of the Society as were within reach, you have been able to satisfy yourself by ocular inspection, of the beauty of this new production, which to persons unacquainted with its origin, would have appeared to be merely a variety, though a splendid one, of Amaryllis vittata, as it

* See Volume iv. page 498.

resembles that species in general appearance, but preserves the more expanded form and broader petals of its male parent, A. Johnsoni. With A. Johnsoni it also conforms in throwing up two scapes together, an occurrence which I have never seen but once in A. vittata, though there are numerous flowering bulbs of it in the collection at this place. When placed by the side of Amaryllis vittata, of which we had strong specimens at the same time in flower, it eclipsed it; the crimson streaks were wider, more defined, and of a richer tone of colour, which, aided by the greater width of its laciniæ, and their broader expansion, gave it greatly the advantage; additional beauty also resulted from the deeper and more conspicuous tint of the crimson streaks on their exterior surface. Four of the bulbs which flowered here, and one which flowered in the collection of the Hon. William Herbert, at Spofforth, agreed almost entirely in character; but two others of the same set varied, by taking after the male parent A. Johnsoni, in colour and general appearance, yet differing enough to constitute lovely varieties distinguishable also from it in smell, in which respect they approximate to A. vittata.

I may as well observe here, that in calling these new productions *hybrids*, I adopt the phraseology in common use, without being convinced of its propriety, but rather doubting it. It appears to me highly probable, that the same obstacles which have been so wisely applied by the creative power to a confusion of races in the animal kingdom, may have been extended to the vegetable one, and that every true hybrid plant is sterile. When, therefore, by the artificial union of two plants of the same genus, classed by naturalists as distinct species, we succeed in raising a progeny perfect in all its

organs, and capable of propagating itself, it may perhaps be fairly doubted, if the parent plants were originally distinct. Whether Providence originally created one species of Amaryllis, whose seedlings, becoming gradually disseminated over extensive regions within, or bordering upon, the tropics, and differing in elevation, temperature, soil, and more or less humid climate, assumed, in the course of ages, varied forms and colours of leaves, and corolla, constituting striking distinctions; or whether it created, simultaneously, many individuals of the same genus, differing enough in external appearance to be classed botanically as species, but formed in the same mould as to the organs of reproduction, and therefore capable of breeding together, are questions which I cannot presume to answer. In the expectation, however, of throwing some faint light upon the subject, I hope hereafter to transmit you some specimens of the unadulterated progeny of Amaryllis Reginâ-vittata, as the seedlings are making progress here. We may perhaps, in time, be able to arrive at a knowledge of the law which governs these new productions, and decide whether they are permanent or fugitive varieties. That they are beautiful acquisitions to our collections there is no doubt. I have raised some new crosses this spring, of whose magnificence I have sanguine expectations.

Believe me, dear Sir,

most faithfully yours,

James Robert Gowen.

Highclere, near Newbury,
9th May, 1823.

LXII. *On the Cultivation of the* Pine Apple. *In a Letter to the Secretary. By Mr.* Alexander Stewart, *Gardener to Sir* Robert Preston, *Bart. at Valleyfield, near Culross, Perthshire.*

Read December 2d, 1823.

Sir,

In the *Cultivation of Pine Apples,* I have been led to adopt a plan similar to the one recommended* by Thomas Andrew Knight, Esq., the President of your Society, and in hopes that they may assist in establishing his views on the subject, I have ventured to address to you the following particulars. Early in 1820, I felt very desirous to grow Pines without the aid of tan, and, if possible, to give them a greater portion of steam than I had hitherto been able to do: I therefore, with the permission of Sir Robert Preston, fitted up one of the Melon pits upon the same principle as that adopted by Mr. Kent,† for his exotics, placing the plants on the sand which covers the bottom of the pit, above the air chamber, the flues running directly below them, so that when moisture is added either to the plants or to the sand, it causes a fine gentle steam to arise through the whole of the pit, which can be regulated at pleasure, by adding more or less fire, as the season or other circumstances may require. The pit was first filled with crowns and suckers taken from the plants early in the autumn, and

* See Horticultural Transactions, Volume iv. page 72.

† Ibid. Volume iii. page 24.

just established in their pots, when they were placed on the sand, they succeeded so well through the winter and spring, that many of them fruited in the following autumn (1821), and weighed from two to three pounds each. They were all Queen Pines. Since that time we have continued to grow them in the same pit, and last year we fitted up another of forty feet, in the same manner, being fully convinced that tan is quite unnecessary even for rooting the crowns and suckers, which I have found to succeed quite well in the sand, or in a little old tan, or decayed leaves laid about them. I have generally shifted the plants into larger pots as they required. The temperature kept during the spring and summer is from eighty to one hundred degrees through the day, and as low as from sixty-five to sixty degrees during the night; in the autumn and through the winter, it is as low as forty-five or fifty degrees. I annex a section of the pit, and where coals are moderate in price, I have no hesitation in stating, that it is the cheapest plan that I have seen adopted.

I am, Sir, with the greatest respect,
your most obedient Servant.

Valley-field, near Culross,
28th November, 1823.

Alexander Stewart.

REFERENCES TO THE SECTION.

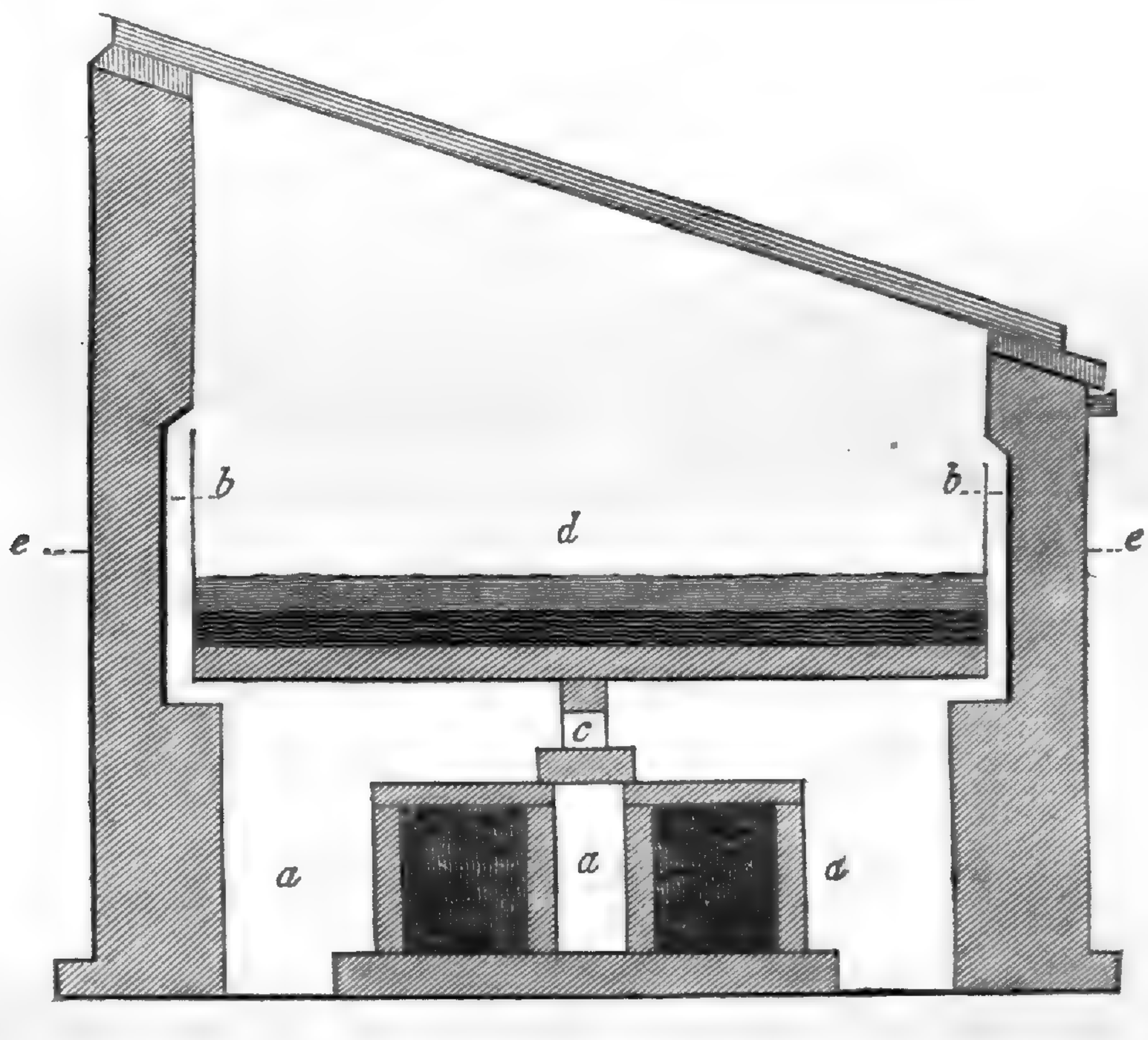
a. a. a. Air chamber.

b. b. Tubes for conducting the heated air through the upper part of the pit, one below each light, back and front.

c. Three courses of open brickwork, to support the bottom of the pit.

d. Six inches of gravel and sand, laid on the bottom, to set the plants on.

e. The surface of the ground, outside the pit.

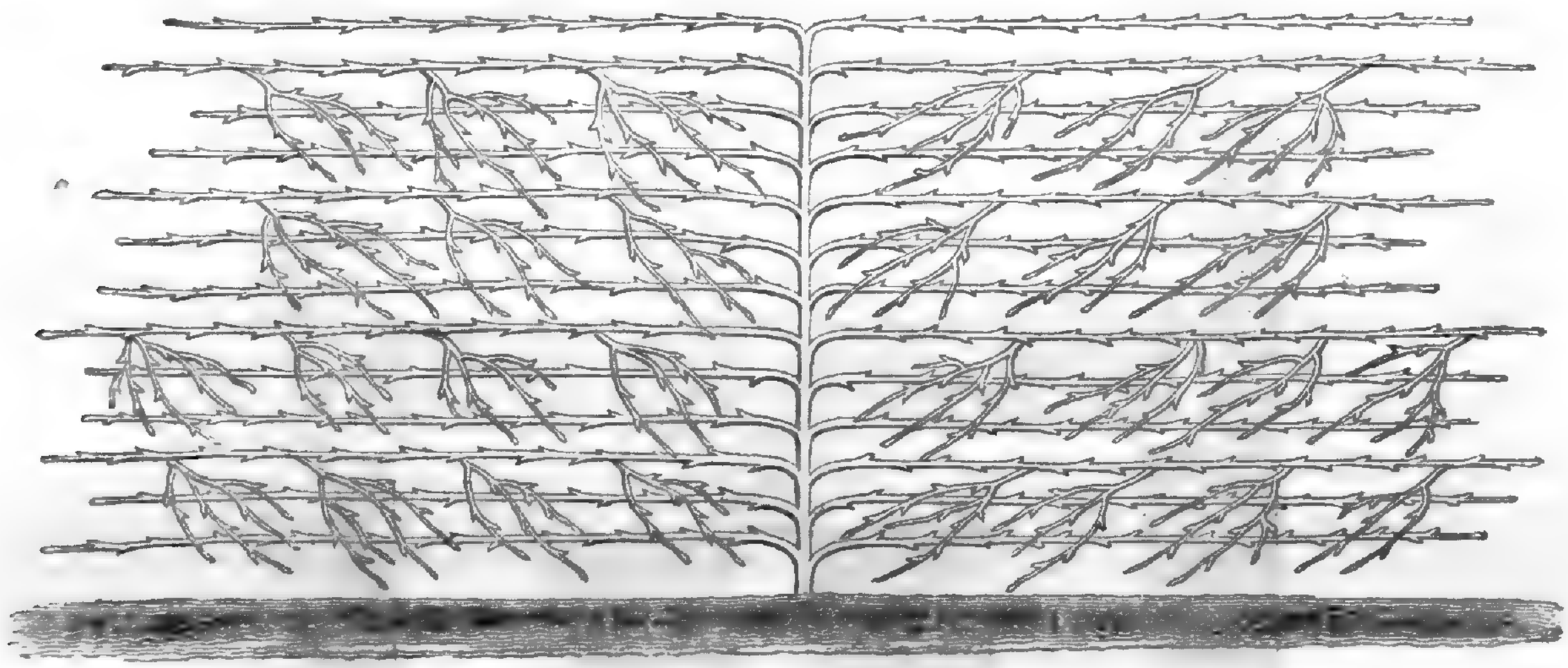


LXIII. *Description of a Pear Tree, on which the Operation of* Reverse Grafting has been performed. *In a Letter to the Secretary. By Mr.* William Balfour, *Gardener to the Earl* Grey, *at Howick, in Northumberland.*

Read November 4th, 1823.

Sir,

I have sent you, for the inspection of the Society, the annexed figure of a Pear Tree, and specimens of its produce, viz. the Gansel's, the Ormskirk, and the York Bergamot Pears.



The main tree represented is the Summer Bonchrétien, trained horizontally on a wall with a south aspect. The descending shoots are of various kinds of Pears, grafted reversely, upon the under side of the horizontal branches; which operation I have termed *reverse grafting*. The scions for this method are inserted in the same manner as in rind grafting,

and by cutting off the greater part of the spurs of the branch intended to be grafted, the scions take readily, and shoot freely. The fruit sent is the produce of the reverse grafts, the fifth season after grafting, but this season is not the first; these grafts having produced fruit before. The Calliot Rosat, the Muscatel, and the Orange Bergamot, produced the third season from the graft, the Gansel's, the Ormskirk, and the York Bergamots, produced fruit the fourth season; this was last year, in which the weather was so fine that the Pears were superior in size to this year's produce, and were also of delicious flavour. The intermediate horizontal branches are intended to be divested of spurs, or perhaps removed altogether, as may be judged most expedient hereafter.

I was induced to try the above method of grafting, in consequence of the usual defect of horizontally trained trees, viz. barrenness to some distance on either side of the main stem, while the extremities of the branches are fruitful. It promises to remedy this, and it also affords the advantage of growing a number of kinds of Pear upon a small space of wall, for any desired kinds may be put upon the same tree. A full grown Pear Tree, bearing a moderate crop, in many kinds, yields more fruit than sufficient to supply the dessert for a family, while the kind is in season, hence the advantage of growing more than one sort on a tree. The succession of Pears is rendered more complete, where the same sort is worked on branches in different aspects.

I remain, Sir, your obedient Servant,

William Balfour.

Howick, near Alnwick,
October 25th, 1823.

LXIV. *Notice of new or remarkable* Varieties of Fruits, *ripened in the Summer and Autumn of the year* 1822, *which were exhibited at Meetings of the Horticultural Society.*

Strawberries.

Mr. John Nairn, Gardener to Thomas Forbes Reynolds, Esq. at Hackbridge in Surrey, sent to the Meeting on the 12th of June, specimens of a new Scarlet Strawberry raised by him from seed. The berries are conical, near an inch long, with a slight elongation of the neck, and with a reflexed calyx. The colour is a very bright scarlet, the seeds yellow, deeply embedded; the flesh is stained with red, but not quite through: in flavour it closely resembles the old Scarlet, but greatly surpasses it in size. The plants are abundant bearers, and carry their fruit well above the ground; it has been named *Nairn's Scarlet Strawberry.*

Mr. John Wilmot sent to the Meeting on the 18th of June, specimens of a Seedling Strawberry raised by him from Keens' Imperial. Its colour is so deep that Mr. Wilmot has named it *Wilmot's Black Imperial:* it is of the middle size, nearly round, some of the berries are flattened into the cockscomb shape; the texture of the flesh is firm, and the surface shines as if varnished; the seeds are yellow, not numerous, nor deeply imbedded; the flesh is of a deep red colour throughout, sweet, and of very superior flavour. The firmness of the exterior of this fruit, as it protects it from injury by carriage, must render it an acquisition for the market.

William Atkinson, Esq. sent to the same Meeting specimens of a new Scarlet Strawberry raised by him from seed in his garden at Grove End, St. John's Wood, Marylebone. It is much larger than the old Scarlet, and more globular, perfectly rounded at the end, extremely bright in colour; seeds pale yellow, small, deeply embedded, but not so deep as in the Scarlet; flesh pale throughout. The plants are abundant bearers, carrying their fruit high from the ground; they also force extremely well; and in the open ground continue in bearing much later than the old Scarlet. This has been named the *Grove End Scarlet Strawberry*, and proves to be a very valuable variety.

Peach.

Mr. Isaac Oldaker sent to the Meeting on the 16th of July, specimens of an early variety of Peach raised in the garden at Spring Grove, from a stone received from Persia. The fruit is of the middle size, globular, slightly cleft; skin pale yellow, mottled with red on the side exposed to the sun; flesh quite melting, pale yellow, with a faint stain of red round the stone, which parts freely; very juicy, extremely rich and sweet; the blossom is very large, and the fruit sets freely; the leaf is deeply serrated on the edges, and terminates with a sharp point. The original plant has been sent by Mr. Oldaker to the Garden of the Society, and has been called the *Spring Grove Persian Peach.*

Grape.

Mr. William Buck sent to the Meeting on the 1st of October a small Vine, in a pot, raised by him from seed in the garden of the Hon. Fulk Greville Howard, at Elford,

near Lichfield. The seed was sown in January 1821, and the plant now exhibited a fair crop, being a remarkable instance of a Vine bearing fruit in the first year from seed. The colour of the berries is a very pale amber, sprinkled with many minute brown spots. Mr. Buck states that the berries, soon after they are formed, assume a triangular shape, which they retain till nearly half grown, when they become quite globular. The texture is rather firm, but not fleshy; it is juicy, sweet, and rich, with a high flavour that compensates for the want of perfume, which is not very distinguishable in it. It has been named the *Elford Seedling Grape.*

Apples.

Michael Bland, Esq. sent to the Meeting on the 1st of October, specimens of an Apple raised in his garden at Norwich, in the year of the Jubilee (1809), and thence called the *Jubilee Pippin.* It is above the middle size, rather conical; eye a little sunk in a contracted cavity; stalk short; skin pale green, with a little russet, and many small pale russet spots; flesh white, crisp, and melting, with high flavoured sugared acid juice. It keeps well, although it is in its greatest perfection in the early part of the season. The tree bore its first crop in 1818.

The Rev. John Symonds Breedon sent to the Meeting on the 15th of October, specimens of a seedling Apple, raised by him in his garden at Bere Court, near Pangbourne, in Berkshire, and named by him the *Bere Court Pippin.* It resembles a large and well formed Nonesuch, but is rather less flattened. The stalk is slender, and deeply inserted;

the skin pale yellow, beautifully variegated with broken stripes of red; the flesh is crisp, very juicy, with a high flavoured acidity. It does not keep late, but is a most valuable Apple for the kitchen, while it lasts.

Richard Waring, Esq. sent to the same Meeting specimens of a seedling Apple raised in his garden at St. Mary's Cray, Kent. It is rather under the middle size, conical, slightly angular; eye small and close, in an even well formed cavity; stalk short, deeply inserted; skin a delicate straw colour, with a very slight blush of red on the exposed side; flesh yellow, crisp, not very juicy, but sweet and high flavoured. It has been named the *Cray Pippin*.

At the Meeting on the 5th of November there were received, through Mr. William Malcolm, from Mrs. Rawson of Halifax, in Yorkshire, specimens of an Apple raised some years since in her garden, and which has been named the *Stony-Royd Pippin*. It was raised from a seed of an American Apple, the name of which was not known, but which probably was the Newtown Pippin, which the seedling very much resembles both in form and flavour. It is stated to keep well till May.

George Caswall, Esq. sent to the same Meeting two beautiful specimens of the *Esopus Spitzemberg Apple*, grown on a south wall in his garden at Sacombe Park, Hertfordshire. This is an American Apple of so much excellence, that it may well deserve the protection of a wall, without which, it is probable, it will not succeed well in our climate,

Its form and qualities are so accurately described by Mr. Coxe, in his work on American Fruit Trees *(p. 127), that the passage is here extracted. "This Apple possesses great beauty and exquisite flavour; it is said to have originated in the vicinity of Albany. In size it is a large Apple; in form oblong, a fair smooth skin; the colour a lively and brilliant red, approaching to a scarlet, with numerous small yellow spots; the flesh is yellow and singularly rich, juicy, and sprightly; the stem is of moderate length, planted in a deep hollow, the end projecting a little beyond the level of the fruit: its maturity is about Christmas."

John Braddick, Esq. sent to the Meeting on the 17th of December, specimens of a very fine Apple, grown in his gardens at Thames Ditton, having the name of the *Claygate Pearmain.* It was the produce of a bud taken from a seedling tree in a hedge row in the hamlet of Claygate, near Thames Ditton. It is a large and very handsome Pearmain. The skin is of a dull yellow, nearly covered with broad stripes of deep red; the flesh is yellow, rather dry, like all Apples of this class, but sweet and very rich. It keeps well, and may be considered as a valuable addition to our stock of Table Apples.

Custard Apple.

In April, 1823, Earl Powis sent from his seat at Walcot Hall, Shropshire, two fruit of the Custard Apple (Anona squamosa) perfectly well ripened in the stove there. One of the fruit had attained a size nearly equal to that which they

* A View of the Cultivation of Fruit Trees and the management of Orchards and Cider. By William Coxe, Esq. Philadelphia, 1817. 8vo.

acquire in South America; and although it had suffered from being carried so great a distance, was rich and good. This is believed to be the first instance of this delicate fruit coming to maturity in this country.

LXV. *A Description of some* new Pears. *By Mr.* John Turner, *F. L. S. Assistant Secretary.*

Read March 2, 1824.

The confusion which has existed in the nomenclature of the new and valuable varieties of Flemish Pears, is at length yielding to the perseverance of a few zealous cultivators; amongst whom our President, and Mr. Braddick are most conspicuous. To the latter gentleman we are in a great measure indebted for the first introduction of these Pears into this country, and for their subsequent wide dissemination.

From the gardens of Dr. Van Mons at Brussells, the Count Coloma, and Mr. Stoffels, at Mechlin, the scions were, for the most part, first obtained; but, unfortunately, either from a want of attention in taking them off, or from carelessness in naming the trees themselves, little accordance was found to exist between the fruits grown here, and the specimens with the same names received from time to time from Flanders. Subsequently, however, trees and grafts of many of the best kinds correctly named were received from M. Parmentier at Enghien, and from M. Rutteau at Tournay; and the produce of these has materially assisted in detecting the errors which previously existed.

So long ago as 1819, I had begun to describe with some care the varieties of Pears which appeared best to deserve cultivation, and, since that time, have endeavoured to give such attention to the subject, as enables me now to decide

with tolerable certainty upon the authenticity of the fruits as they come under observation.

It is however to be lamented, that no greater care was bestowed on the nomenclature of the new Pears by the persons who raised them; for the plan which they adopted is calculated to lead to endless confusion. In many instances they took an established name, as the Colmar, for example, and then varied it in every possible way; thus we have the Colmar Dorlin, Colmar Van Mons, Colmar Precel, Colmar Gossart, Colmar Vilmorin, and many more, in which the name of some individual is coupled with the name of the fruit to which the seedling is supposed to have some affinity. Then, again, we have Colmar, St. Germain, and several others, with some prefix or affix, intended to express the character of the fruit or tree, as Passe Colmar, Passe St. Germain, Surpasse Colmar, Colmar épineux, Passe Colmar épineux; and in this way the names of almost all the established varieties are presented to us. I need not point out how likely such a nomenclature as this is to lead careless or ignorant persons into error; the consequence will probably be, that the additions to the names will be dropped, as of no consequence, and we shall have Colmars, St. Germains, &c. differing from each other without end.

It will be my endeavour in this and succeeding Papers, to remedy this evil as far as lies in my power, by giving accurate descriptions of the fruits, as their authenticity is ascertained, so that by reference, errors which may creep in will from time to time be corrected. None but those varieties which are of decided excellence will be described; and in every case where the inferior kinds are noticed, it will be only to

recommended that the cultivation of them be discontinued. It is proper to mention here, that all the kinds described in the following pages will succeed well as standards; and in my future notices, whenever a kind is so tender as to require the protection of a wall, the circumstance will be stated.

The Beurré Capiaumont.

This was raised from seed by M. Capiaumont, of Mons. The fruit was first seen by us in 1820, in collections received from M. Parmentier of Enghien, and M. Rutteau, of Tournay. It has been fruited by Mr. Knight, Mr. Braddick, and others. It is as large as a St. Germain, pyramidal, tapering very much towards the stalk, which is long and slender. The skin is smooth, of a light cinnamon colour, with a rich gold colour shewing through it; in some specimens the skin is darker and rougher. The flesh is white, perfectly melting, with a rich sugared juice. I have not observed that it possesses any perfume, but it is nevertheless a high flavoured and valuable fruit. It has not kept with us beyond the end of November.

The Beurré d'Aremberg.

It is as large as a Brown Beurré, but more irregular in its form; the skin is rough, of a dark cinnamon colour, with a few large spots of yellowish green shewing through it; the flesh is perfectly melting, juicy, and sweet. Specimens received from the garden of John Sudlow, Esq. at Thames Ditton, in 1822, did not keep beyond the end of October, but some that were sent by M. Parmentier from Enghein, in November 1820, kept perfectly good till the end of that

month; and, in some manuscript notes on the new Flemish Pears, which I have by me, communicated by M. PARMENTIER, he says, speaking of this variety, "that it will continue in eating from the end of January till the beginning of May." Some specimens sent by Mr. BRADDICK to Mr. WILBRAHAM, in November last, were found not ripe on the 14th of that month.

This is sometimes called the Duc d'Aremberg, and the Poire d'Aremberg; it is also called by Dr. VAN MONS, the Colmar Deschamps, having, he says, been raised by M. DESCHAMPS; but the Beurré (if an old prefix is to be used), which is M. PARMENTIER's name, seems most proper, as it conveys an idea of the quality of the fruit. A Pear, with this name, is described by M. NOISETTE, in the *Jardin Fruitier*, page 170, and is there stated to have been brought by him from Brabant, in 1806, from the garden of the Prince d'Aremberg. Specimens of this Pear have been received from M. NOISETTE, but it proves to be not the Beurré d'Aremberg, but the Gloux Morceaux, a variety which I shall have occasion to speak of hereafter. Mr. BRADDICK, and probably others, have grown this latter Pear from grafts or buds received from M. NOISETTE, under its erroneous name.

The Bezy Vaet.

Raised from seed by M. PARMENTIER, at Enghien. Dr. VAN MONS considers it a variety of *Chaumontel;* the specimens received from M. PARMENTIER in 1820 had, however, a closer resemblance to the Swan's Egg. It has fruited in the garden of Lord HENRY FITZGERALD, at Thames Ditton. It is of the form of the Swan's Egg, but larger, the eye little

sunk, stalk rather more than an inch long, skin dull green, sprinkled with a little russet. Flesh yellowish, perfectly melting, remarkably sweet, and very agreeably perfumed. M. Parmentier states that it will keep till April; I have, however, not found any that remained good beyond the end of November. The tree bears abundantly.

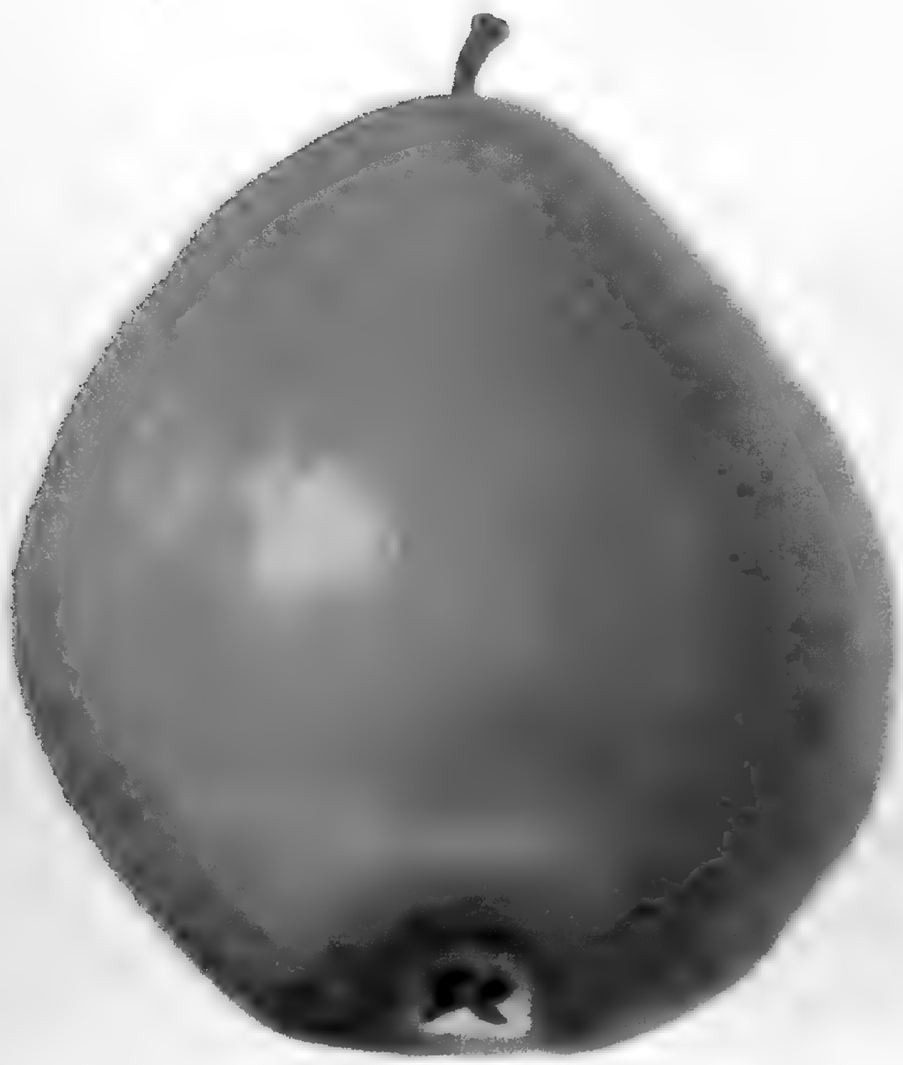
La Bonne Malinoise.

I have already noticed this excellent Pear in an account of some varieties received from M. Stoffels, of Mechlin,* in the seasons of 1818 and 1819. It has now been produced in this country, and maintains the high character which I then ventured to give it. It was raised from seed by M. Nelis, of Mechlin, a gentleman whose name has been given by Dr. Van Mons to a winter Pear of very great excellence. In the notice of it above referred to, it is said to resemble in some degree the Chaumontel; having then had but a single specimen to examine, the description was not so accurate as it might have been; it has, in fact, more of the shape of a Colmar, being a little more pointed at the stalk end. The skin is of a dull pale yellow colour, very much covered with smooth russet in large patches. The flesh is yellowish, melting, extremely rich, and sweet. It ripens towards the end of November. The figure in the Plate which accompanies this Paper, conveys a perfect idea of this very superior variety.

The Forelle.

A German variety, brought into Flanders, and thence to this country. It is named Forelle (Trout), from its colour,

* See Horticultural Transactions, vol. iv. page 276.



which resembles the bright spotting of that fish. It is given in the Geneva and some French Catalogues, under its translated name (Poire Truite), and is minutely described by Dr. DIEL,* who supposes that it originated in Northern Saxony. It is of the size and shape of the Doyenné Blanc, though perhaps a little more oval; stalk about an inch long; skin bright yellow, very deep red on the exposed side, sprinkled with numerous small yellow spots, surrounded by a brown or reddish ring, giving to the whole fruit a remarkably beautiful appearance. The flesh is white, quite melting, without grit, juicy, and very sweet, but without perfume. It ripens in November, and will probably keep later. This cannot be placed in the first class of Pears, although possessing very considerable excellence; but its extraordinary beauty will always recommend it for the dessert. The annexed figure is drawn from a fruit grown by THOMAS ANDREW KNIGHT, Esq. at Downton,

Riche Dépouille.

This has come into the English Collections with the name Riche d'Apoil; I have not hesitated to make the correction, being satisfied, from the appearance of the Pear, that Riche Dépouille is its true name. The Citrus Begardia crispifolia, or Melangolo riccio, is called by the French Bigardier Riche Dépouille,† and the skin of this Pear being covered with minute asperities, like that of an Orange or Citron, induces me to believe, that in naming it, a comparison was made between it and the Citron. It resembles the St. Germain in shape and size; it is well rounded at the eye (which is somewhat prominent),

* Versuch einer Systematischen Beschreibung in Deutschland Vorhandener Kernobstsorten, Vol. v. p. 51.

† *Rich-skinned* may be given as the translation.

and tapers considerably towards the stalk, which is rather thick, and about an inch and a half long. The skin is of a clear Citron yellow, with a very slight tinge of scarlet on the exposed side, a little mottled with russet, and the whole rough, as already mentioned, like the skin of an Orange. The flesh is white, melting, not perfumed, but sweet, and very pleasant.

The Passe Colmar.

This was raised by M. Hardenpont, of Mons, a gentleman whose name is attached to many excellent varieties, most of which were raised by himself. Dr. Van Mons calls it also the *Fondante de Panisel.* It is as large as a Colmar, more tapering towards the stalk. The skin is a pale green, slightly marked with red on the exposed side, and sprinkled with minute green spots. The flesh is yellowish, melting, though not buttery, very juicy, and extremely sweet. It keeps well till the end of December, and even later.

The Passe Colmar gris de Precel.

A variety of the Colmar, raised by M. Precel, at Enghien. It is larger than the Colmar, and more irregular in shape. The skin is dull yellow, with a tinge of brown red on the exposed side, and is spotted with a few patches of brown. The flesh is white, of the texture of the Colmar, very juicy, extremely sweet, and agreeably perfumed. I have not tasted it later than the end of November, but M. Parmentier, in the manuscript notes above-mentioned, says, he has preserved it good till June.

The Beurré Diel.

This was raised by Dr. Van Mons, at Brussels, and named

in honour of Dr. Diel, of Nassau Dietz, author of the very excellent work on Pomology just cited, and a valuable Correspondent of the Horticultural Society. It is as large as a fine Summer Bon Chrétien, and resembles it in shape. The skin is smooth, of a bright Citron yellow; flesh white, and melting, with a rich sweet juice. It ripens in November, but will keep well through the whole of the following month.

The Urbaniste.

This variety was derived from the garden of the Count Coloma, by whom it was raised, and has been fruited by Mr. Braddick and Mr. Knight. It is egg-shaped, very even in form, eye a little sunk, stalk about an inch long, inserted in a cavity of moderate depth. Skin pale green, inclining to yellow, profusely spotted with greenish spots, and having small patches of thin russet dispersed over its whole surface, but more abundantly round the eye and stalk. The flesh is white towards the outside, but deepens to a reddish yellow next the core, which is large, and possesses a small quantity of grit. It is quite melting, juicy, and very sweet, but without perfume. The specimens which we have received have not kept beyond the end of October.

Account and Description of five new Chinese Chrysanthemums; *with some Observations on the Treatment of all the Kinds at present cultivated in England, and on other Circumstances relating to the Varieties generally. By* JOSEPH SABINE, *Esq. F.R.S. &c. Secretary.*

Read April 20th, 1824.

IN a former communication* to the Horticultural Society, after noticing some new varieties of the *Chinese Chrysanthemums*, I mentioned the existence of others which had not flowered sufficiently well to enable me to describe them correctly at that time, which was subsequent to the autumn of the year 1822. Since that period, these, as well as other new kinds, have perfected their blossoms, and I am now about to add to the twenty-two already described, the names and characters of five more, making the present stock of varieties twenty-seven.

The first of those above alluded too was stated† to be semi-double, with quilled orange florets. It will be called the *Semi-double Quilled Orange Chrysanthemum.* It usually approaches very nearly to a state of perfect singleness, having always a very large disc of short tubular florets; in some instances, however, it has more ligulate florets than will justify its being called single. The stem is strong and tall, and its branches spread, producing from one to three

* See Horticultural Transactions, Vol. v. page 149.

† Ibid. Vol. v. page 159.

flowers at their extremities, nodding from their weight. The blossoms open rather later than the middle of the flowering season, and their scent is strong like chamomile. The expansion of a good flower is full five inches. The florets of the ray are placed in regular order round the margin of the flower, and are of various lengths, the longest being about two inches, and the shortest not exceeding an inch. Their colour is a very deep red orange, but they are yellow at the base; their shape is peculiarly slender, being also flattened, and much channelled in the upper side; they project forwards, and spread out, forming a flower more or less open according to their expansion; the florets are completely quilled, having in most cases a very narrow mouth, but sometimes the opening is more enlarged, though not much so. The disc is yellow, large, as before stated, and semi-globose. The leaves are peculiar, being short, thick or fleshy, shining, and usually somewhat concave; the indentures are deep, the lobes approach, and sometimes over-lap each other; the edges of the leaves are rather incurved, the serratures are bluntly rounded, and have very little appearance of points at their tip.

The next variety was before briefly described* as semi-double, with half-quilled lilac florets. This will be hereafter known as the *Large Pale Purple Chrysanthemum.* The stem is strong, and straggling, producing few shoots, and those do not bear many blossoms. The scent I have not noted, but it is probably that of chamomile, as in the other kinds. This variety blossoms very late. The flower buds are large, and of a reddish purple; when opened they are semi-double with a large disc; their expansion is four inches, and in good seasons will probably be much greater. The radial florets

* See Horticultural Transactions, Vol. v. page 159.

are irregular and of various lengths, but the outer are the longest, and the inner the shortest; the whole are purple, but nearly white at their base; quilled unequally, but on an average about half the length, enlarging upwards in the quilled part. The open part of each floret is flatly recurved, slightly striated, and contracted at the tip. The foliage is very different from all the other kinds, the leaves being large, pale green, and rather hoary, the lobes moderately deep, with the serratures rounded, and having sharp points. The two preceding plants, with eight others, formerly described, and a duplicate of the Quilled Pink,* make the whole of an importation from China in the year 1821, for the success of which the Society is indebted to the care and attention of Captain Charles Otway Mayne, of the Atlas Indiaman.

In the communication I have before alluded too,† I also mentioned a Chinese Chrysanthemum belonging to Mr. Brookes of Ball's Pond, which had produced imperfect flowers, but which I expected to be different from any yet known; a plant of this, which was presented to the Garden of the Society by Mr. Brookes, has since blossomed, and it is proposed to call it the *Quilled Salmon-coloured Chrysanthemum.* The plant is tall and rather straggling, the branches being weak and slender. The blossoms come out rather late in the season, and are neither very conspicuous nor splendid; they grow upright. The scent is not strong, but resembles Chamomile. The buds at first are a deep orange red, but as the florets expand they acquire a lighter hue, approaching to pink or salmon colour. The expansion of the flower is above three inches; it is rather flat, and not

* See Horticultural Transactions, Vol. iv. pages 334, and Vol. v. page 151, and 159.

† Ibid. Vol. v. page 159.

very much filled with florets; a disc is sometimes apparent in its middle. The florets are of various lengths, diminishing, as they approach the centre, to extreme shortness, those in the circumference being the longest; they are quilled, but most of them open into a spoon-shaped form, about one forth of the length, those in the centre retain a deeper and richer cast of orange than the marginal ones. The leaves are very peculiar, they are small, and dark green, having rather long foot-stalks with shallow indentures and serratures deeply pointed.

Small Yellow Chrysanthemum. Plants of this variety were received by the Society in the end of the year 1821 (but did not blossom in that season) from Robert Barclay, Esq. of Bury Hill, and Henry Goodhall, Esq. as a new yellow Chrysanthemum, but no account of its origin was communicated by either of these gentlemen. From enquiries subsequently made, and especially from the information of John Robinson Payne, Esq. I have reason to think that it has existed for some years; having been five or more in his garden at Bromley in Middlesex, to which place it was brought from another private garden at Plaistow in Kent. As there are two other kinds with flowers of the same colour, the Golden Yellow and the Sulphur Yellow, for which it might have been taken by inexperienced cultivators, there is less cause for surprise that it should have remained so long unnoticed. The plant does not grow tall; the branches are compact, and rather rigid, with short joints. The blossoms come out at the same time nearly as the Rose or Buff; their scent is not strong, though partaking of that of Chamomile; their colour is entirely pale yellow, rather paler than that of the sulphur yel-

low. The florets are all short, nearly of equal length, and form a globular head, like those of the Rose or Buff, to which, as regards its blossoms, except in colour, it has a strong resemblance, not only in shape but character. The flowers grow upright, and several are produced on the ends of each shoot; their expansion is small, not exceeding two inches; the florets are broadly ligulate, without tubes, contracted at their tips, which are marked with fine serratures. The leaves are dark green with deep indentures, not overlapping, the serratures round, and obtusely pointed. A comparison of the above description, with the characters of the Rose and Buff Chrysanthemums,* will justify me in the conclusion that this kind is a permanent sport from the latter of the two varieties, which in certain situations, and especially in bad seasons, loses most of the reddish colour which belongs to it when perfect, and puts on a dingy yellow hue. The colour of the Small Yellow Chrysanthemum is, however, very bright, and I have not myself observed in it any disposition to return back to its supposed type, or to run away in any particular from its character.

In my first notice† of the Rose and Buff Chrysanthemums, it was supposed that these varieties mutually sported into each other, but I now believe that is not the case, and that the Buff is alone the sporting plant, frequently throwing out a branch bearing Rose flowers. It is necessary to observe, that in cultivating the sporting varieties, the return of the sport is not always to be depended on, for it frequently happens, that a root which sports in one season, will in the next

* See Horticultural Transactions, Vol. iv. pages 344, 345, and 346.

† Ibid. Vol. iv. pages 344, 345, and 346.

produce only one kind of flower on all its branches, which, it will be recollected, are only annual productions.

If the origin of the Small Yellow is a matter of doubt, that of the *Paper White Chrysanthemum*, which I am now to describe, will be determined with still greater difficulty. The only point of certainty respecting it is, that it is not a sport from any other kind cultivated in England, for its foliage differs from all sufficiently to justify the statement that it is original. It is not probable that it was raised from seed, because we have not yet had any instance of such mode of increasing Chrysanthemums in our climate, so that we are necessarily driven to consider it as a new introduction from China; which, by one of those misfortunes to which plants in their transmission from shipboard to the garden, are too often subject, had perhaps strayed from the possession of its importer.

A plant of this Chrysanthemum was accidentally seen by Mrs. Marryat, of Wimbledon, in flower, in the autumn of of 1821, in Covent Garden, and purchased for a sum not exceeding that for which the commonest varieties are usually sold. Its merits were then first observed, and the name by which it is now known was attached to it; plants of it were propagated, which flowered in the season of 1822, and some were presented to the Horticultural Society both by Mrs. Marryat and Mr. Joseph Marryat, her son, from their respective gardens. The plant is of moderate height, with stiffish spreading branches; the blossoms open soon after those of the early kinds, three or four in a corymbus, and are rather pendant. The scent is mild. The expansion of the flower is near three inches, in some cases it shews a

small yellow disc. The florets are numerous, spread wide, and are rather flaccid, they are of the purest white, flat and broad, without quills, of various lengths, so that the circumference of the flower is irregular, those in the centre are the shortest, especially when there is no disc. The leaves are a deep green, with rather shallow indentures overlapping each other; the serratures are bluntly pointed. The peculiar excellence and characteristic of this variety is the perfect whiteness of its blossoms, their purity exceeds that of any other kind we have, and I may almost venture to add, that of any known flower.

I expected that in the last season I should have been enabled to have announced, under the name of the *Pale Pink Chrysanthemum*, one other novelty, to the collectors of these plants, but it is not yet sufficiently established to be so considered. In November 1822, a branch of the Rose or Pink Chrysanthemum, produced in Mr. Colvill's nursery at Chelsea, one branch, the flowers of which were similar to those on the other branches in all points, except in colour. Cuttings taken from this branch were struck, but they did not produce flowers in the last season, we consequently cannot affirm the establishment of the sport as permanent. The flowers, instead of being one uniform colour, were nearly white in the middle; and as the florets receded from the centre, they became slightly tinged with pink or flesh colour, the florets on the outside being still deeper, and nearly as much coloured as those of the original plant. They had the appearance of having been produced in the shade, but which could not have been the case, because the remainder of the flowers on the same plant were coloured as deeply as they usually are.

The past autumn was very unfavourable to the flowering of the Chinese Chrysanthemums; they generally blossomed indifferently, and even those protected by houses, and apparently managed with the greatest skill, did not succeed. The best shew of them which came under my notice, was on the south wall of the Arboretum in the garden of the Horticultural Society, against which all the twenty-seven varieties had been planted. The whole were trained during the summer to the wall, each plant having the branches placed very close together in a fan-like manner. Notwithstanding the unpropitiousness of the season, the whole collection grew well, and the greater part blossomed in perfection. I am consequently enabled to give the following view of their respective qualities in such a situation, which I consider by far the most preferable for them in the open air. When placed against a south wall they will stand the severity of such a winter as that of 1822-3, which was very trying generally to tender plants, without other protection than mulching their roots. It is desirable that the old roots should remain, and not be replaced by young plants when thus cultivated, because the stronger they are, the more branches will be produced, and on the number of these the superiority of their beauty depends.

1. *Purple.* Blossoms early and well, with rich colour. Foliage good and perfect, but thin. Plant not strong, and the branches short.

2. *Changeable White.* Blossoms early and freely, exhibiting its changeable character better than in any other situation. Foliage good, but thin. Plant not strong, and the branches short.

3. *Quilled White.* Blossoms the earliest, and freely, be-

coming much tinged with pink at a later period. Foliage thick, good, and lasting,. Plant tall, but not strong.

4. *Superb White.* Blossoms after the middle season, splendidly, and tolerably abundantly. Foliage particularly good, healthy, and thick. Plant tall and strong.

5. *Tasseled White.* Blossoms very late, not shewing its buds until the end of the season, but when they open they remain in flower later than all the others. Foliage fine, strong, and thick. Plant very vigorous and tall.

6. *Quilled Yellow.* Blossoms rather late, weakly, and not abundantly. Foliage remains good late, but is thin. Plant not strong, though tall.

7. *Sulphur Yellow.* Blossoms well and early, the back of the florets becoming tinged with red. Foliage good. Plant not strong, grows high, but is rather tender.

8. *Golden Yellow.* Blossoms sufficiently numerous, but small, and consequently not good. Foliage imperfect. Plant rather tall and tender.

9. *Large Lilac.* Blossoms in the middle season, and well, with much colour. Foliage not good. Plant grows moderately strong, but not high.

10. *Rose* or *Pink.* Blossoms early, and most abundantly. Foliage remains perfect. Plant strong, but not high.

11. *Buff* or *Orange.* Blossoms early, and very abundantly. Foliage good, and continues perfect. Plant strong, but not high.

12. *Spanish Brown.* Blossoms early, beautifully and abundantly, the colour of its flowers is more brilliant than when under glass. Foliage good and perfect. Plant grows freely, and well, but not high.

13. *Quilled flamed Yellow.* Blossoms well, tolerably freely, and in the middle season. Foliage not good. Plant tall and strong, but tender.

14. *Quilled Pink.* Comes into flower very late; none were consequently produced in the last season. Foliage very perfect, healthy, and lasting. Plant vigorous and tall.

15. *Early Crimson.* Blossoms weak, and not abundantly, but early; not so early, however, as is stated in the first account published of it.* Foliage imperfect and thin. Plant delicate, short, and tender.

16. *Large Quilled Orange.* Blossoms well, but sparingly, rather later than was formerly stated.† Foliage very perfect, strong, but not thick. Plant vigorous and tall.

17. *Expanded light Purple.* Blossoms about the middle of the season well, but not in quantity. Foliage thin. Plant neither tall nor strong. The flowers of this and of the next are sometimes very large, which was not the case when they were described‡ by me, on their first introduction.

18. *Quilled light Purple.* Blossoms in the middle season well, but not abundantly. Foliage thin. Plant neither tall nor strong.

19. *Curled Lilac.* Blossoms early, with fine clusters of flowers, and in high perfection. Foliage good, and continues long green. Plant tall and strong.

20. *Superb Clustered Yellow.* Blossoms early and finely in thick clusters, the flowers are very much tinged with red after the weather becomes cold. Foliage good in the first of

* See Horticultural Transactions, volume v. page 151.

† Ibid. volume v. page 152.

‡ Ibid. volume v. page 153, et seq.

the season, but is damaged by cold in the latter part. Plant strong, though not very tall.

21. *Semi-double Quilled Pink.* Blossoms early and freely, and the florets have a much richer colour than when produced in houses. Foliage tender, and injured by the weather, even whilst the flowers are in perfection. Plant rather weak, but tall.

22. *Semi-double Quilled White.* Blossoms after the middle season well, and very abundantly. Foliage good and lasting. Plant strong and tall.

23. *Semi-double Quilled Orange.* Blossoms late and very sparingly, more double than when protected by glass. Foliage thin, but healthy. Plant not strong, though inclining to be tall.

24. *Late Pale Purple.* Blossoms very late, the buds were not even shewn last season. Foliage strong, perfect, and thick. Plant very vigorous and tall.

25. *Quilled Salmon Colour.* Blossoms late and very sparingly. Foliage good. Plant neither strong nor tall.

26. *Small Yellow.* Blossoms well, and in abundance. Foliage very perfect. Plant strong, but short.

27. *Paper White.* Blossoms rather early and finely; the blossoms occasionally shewing more of disc than when produced under cover. Foliage healthy, but not thick. Plant not strong, but moderately tall.

Since my last communication on the Chinese Chrysanthemums, two of the new varieties have been published in "Sweet's *Flower Garden,*" these are the Curled Lilac, called C. Sinense involutum, and the Superb Clustered Yellow, called C. Sinense fasciculatum. I am not aware of any other

figure having been engraved since those which have been already noticed by me, or given in the plates which accompanied my different descriptions of the varieties in the *Transactions of the Horticultural Society*.

It is very desirable that all the kinds stated should be figured; they are very attractive objects, and are well suited to our periodical Botanical Works. Only the following have yet been represented in engravings:

1.	Purple	Botanical Magazine	327
2.	Changeable White	ditto	2042
3.	Quilled White	Botanical Register	4
4.	Superb White	ditto	455
5.	Golden Yellow	ditto	4
6.	Quilled flamed Yellow	Hort. Soc. Trans. vol. iv. pl.	14
7.	Quilled Pink	Botanical Register	616
8.	Early Crimson	Hort. Soc. Trans. vol. v. pl.	3
9.	Large Quilled Orange	ditto vol. v. pl.	3
10.	Curled Lilac	Sweet's British Flower Garden	7
11.	Superb Clustered Yellow,	ditto	14

The Council of the Society having directed that figures, to accompany this Paper, should be prepared of the Semi-double Quilled Pink, the Quilled Salmon-coloured, the Semi-double Quilled Orange, and the Small Yellow, the number of those remaining to be published will consequently be so far diminished.

The different appearance of the flowers of many of the Chinese Chrysanthemums, when produced in the open air, from that they assume when protected under glass, was particularly striking in the last autumn. As far as my observations have ex-

tended, those which became deeper coloured by exposure are the Purple, the Changeable White, the Large Lilac, the Spanish Brown and the Semi-double Quilled Pink; on the contrary, the Rose or Pink, the Quilled flamed Yellow, and the Early Crimson, lost much of their brilliancy; whilst some others did not appear to be much altered by the difference of treatment, especially the Superb White, the Large Quilled Orange, the expanded light Purple, the Quilled light Purple, the Curled Lilac, the Superb Clustered Yellow, and the Paper White. My opportunity of examination did not extend so completely to all the kinds, but that future observations may probably enable me to make additions to each of the classes noticed above. The varieties which flower very imperfectly or very late in the open air are not fit objects for cultivation, except under glass. The changes of colour I have here observed on, are distinct from that which takes place chiefly on the exterior florets of some kinds, more particularly the Quilled White, Sulphur Yellow, and Superb Clustered Yellow, when exposed to a colder atmosphere than they are naturally formed for.

I am induced to bring these changes in the appearance of the flowers particularly into notice,because they have often caused persons who are not fully aware of them to imagine that they possessed new varieties, or, as has much more frequently occurred, to suppose that the different kinds were liable to vary in the character of their flowers, when the alteration was solely the consequence of difference of situation, and temperature. Some changes certainly do take place in the blossoms of Chrysanthemums, even when the plants producing them are under apparently similar circumstances;

but they are not sufficient to justify the opinion that the varieties are not steady to their characters. Those which usually have quite double flowers sometimes produce semi-double ones, and the blossoms of semi-double flowering plants occasionally lose all appearance of a disc. Sometimes also, considerable differences occur in the opening of the quilled parts of the florets, so as to give the appearance of expansion to the quilled varieties, and of being quilled to those which have been described as expanded. This last circumstance frequently occurs with the Purple Chrysanthemum, which in its usual state has its flowers well expanded, but at times the florets of an entire plant will come quilled, and then have been mistaken for those of a new variety.

I am of opinion that the flowers of the Chrysanthemums have a very different appearance in the gardens of the Chinese from that which they assume under the treatment of the English gardener. I am led to this, from an examination of the drawings in the Library of the Horticultural Society, which have been executed from living plants at Canton, by one of the best native artists. There are upwards of fifty different varieties represented in these drawings, very few indeed of which can be considered as resemblances of the plants which have blossomed in this country, and yet it is scarcely possible to suppose that some of our imported varieties are not referable to them. Of the correctness of the representations in these drawings I have little doubt, because the resemblances of other plants figured by the same artist, which have blossomed here, are perfect. The Society is also possessed of a series of very accurate drawings of all the varieties, which have been described by me in the *Transactions*, taken

from plants in its own garden, and by comparison of the two collections, the differences between the general appearance of the plants in China and in England may be readily estimated.

This circumstance renders it impossible to apply the names given to the different varieties by the Chinese cultivators with any expectation of being correct. My friend Mr. Reeves has supplied me with the translation of most of the appellations by which the kinds of which the Horticultural Society possesses drawings are known in China; many of these are curious and fanciful, and if they could be adopted, would afford a variation in our nomenclature, as well as relieve us from some perplexity in giving names derived from the colours of the blossoms, a difficulty which will increase upon us as the number of our collection increases. The following will serve as specimens of the Chinese names, " the Purple Lily," " the White Waves of Autumn," " the Purple Pheasant's " Tail," the Scarlet Robe," " the Yellow Gold Thread," " the " Purple Butterfly," " the Purple Pheasant's Feather," " the " Yellow Tiger's Claw," " the Chrystal White."

The varieties of these beautiful plants are so numerous in their native country, that we may expect considerable accessions to our stock from time to time. The difficulties of introducing them from China are great; for in addition to the many risks and dangers which all plants are exposed to in so long a voyage, the weak shoots of the Chrysanthemums are but ill suited to bear the vicissitudes of climate which they have to encounter in crossing the line twice, and in their exposure to the storms which are met with off the Cape of Good Hope, and which are so peculiarly hostile to tender vegetation. The endeavours of the Horticultural Society,

aided by the friendly exertions of Mr. Reeves, and the obliging attentions of the Commanders of the China ships, have been unceasingly directed for some years towards the introduction of these and other ornaments of the Chinese gardens. In the year 1822, a severe disappointment was experienced, as respected the Chrysanthemums; an assemblage of forty varieties corresponding to the drawings then in the possession of the Horticultural Society, had been diligently made by Mr. John Potts, a gardener in the service of the Society, who went to China in 1821, but the whole were lost in consequence of an accident which befel the ship, in which they were embarked, in her voyage home. We look with confidence to a more successful issue in this class of plants, to the mission of Mr. John Damper Parks, who went to China last year, and is now on his return home; the plants already received from him, amongst which are several Chrysanthemums, have arrived in a much healthier state than usually has been the case, and which is attributable not only to the care with which they were packed, but to the attentions which were given to them during their voyage.

In my last communication on this subject, which has been printed in the *Transactions*,* I intimated the probability that these plants might hereafter be considered as belonging to a species distinct from the Chrysanthemum Indicum of Linnæus. This position I have endeavoured to establish in a communication† to the Linnean Society. It is there proposed that the species to which these belong shall hereafter be considerad as the Chrysanthemum Sinense, the type of

* See Horticultural Transactions, Volume v. page 161.

† See Linnæan Transactions, Volume xiv. page 142.

the species, as far as we are yet informed, being the Semi-double White Chrysanthemum. LINNÆUS appears to have considered the small flowering plants alone as his Chrysanthemum Indicum, and not to have noticed those with large flowers; and there are sufficient differences between the plants which he referred to and described, and these, on which to found distict specific characters.

LXVII. *A Note on the Pears called* Silvanges, *and particularly on the* Silvange Verte (Green Silvange). *By Mons.* Charles Francis Pierard, *of Manjouy, near Verdun-sur-Meuse; Corresponding Member of the Horticultural Society.*

Read March 2d, 1824.

The name of these fruits is derived from a hamlet situated about a mile and three quarters west of the road from Metz to Thionville, upon an ancient road leading to Treves. The type of the variety still exists, it is said, in a garden of the hamlet.

There are three known sorts of *Silvanges;* the *Early Yellow,* the *Long,* and the *Green;* the first, which I never saw any where but in my father's garden, whence we made it known, pretty much resembles the Crassane. Its fruit is beautiful, smooth, of a grayish green colour, yellow when approaching to maturity, the period of which is about the end of September or beginning of October. Its flesh is melting, of a pale yellow colour, perfumed, and excellent, but the tree is a bad bearer.

It is on account of its form, perhaps, that some nurserymen distinguish one kind of Silvange by the name of Bergamotte Silvange; but never having seen this, we have hitherto been wholly unable to compare it with the others.

The second or *Long* variety of Silvange, is the most generally cultivated. It resembles the Doyenné in its form, tapering a little more towards the stalk. The flesh of the

fruit is half melting, white, of an excellent flavour; it ripens in the end of October, and lasts till the middle of December, after which it loses its excellence, becoming doughy and dry.

Of the Silvanges, the *Green*, which is perhaps only a sub-variety of the Long, is much preferable, and ought to find a place in every good garden. It is a middling sized fruit, varying a good deal in its form, which may be compared to that of the Pears called Bergamottes. It is usually flattened towards the head, rounded towards the stalk, or terminated by a very blunt point. The fruit is a little swoln in its middle, and irregular in its outline; the skin is of a bright green on the shaded side, of a dark green and besprinkled with gray spots on the exposed side. The whole of the skin is rough, and marked with large black or gray spots; sometimes the gray spots are very much spread. The stalk is short, slender, and placed obliquely in the fruit, by the side of a slight elevation. The eye is small, and lies in a slightly depressed cavity, the edge of which is studded with several knobs. The flesh is sensibly green, near the skin, white in the centre, fine, melting, soft, saccharine, and of a peculiarly agreeable flavour.

The Green Silvange ripens in the beginning of October, and keeps till the end of December. Besides the advantage of not rotting soon, like the Beurrée d'Angleterre, the Epargne, &c. it has also that of never being gritty. After the last period abovementioned, the skin of the fruit turns black, whilst the flesh for the greater part retains its qualities. The tree of the Green Silvange has appeared to us more fertile than that which produces the Long kind, which last is very subject to crack when the tree grows in bad soil; it also has greater juiciness, and keeps longer.

All Silvanges are rather tender, they require a good soil and a sheltered situation, to ensure handsome and good fruit. When planted in too strong a soil, either dry or moist, and in an exposed situation, they are almost always barren, and soon become covered with moss and lichens, and produce only small cracked fruit, which generally perish before they become perfectly ripe.

LXVIII. *On the Preparation of* Strawberry Plants *for early Forcing. By* Thomas Andrew Knight, *Esq. F. R. S. &c. President.*

Read March 16th, 1824.

The *method of preparing Strawberry plants for early forcing*, that of putting the plants into pots a year, or longer, before they are intended to afford fruit, is generally perfectly successful, and is in every respect eligible, except that it requires a good deal of time and trouble. For if the pots be not regularly watered during the summer after the plants are put into them, the size of the future fruit will be considerably reduced; and if during the following winter the pots be not carefully protected from excess of moisture and frost, a great part of the fibrous roots, which lie in contact with the internal surface of the pots, will be found lifeless in the spring; and many of the pots, if their quality be not very good, will be broken by the expansion of the frozen water.

The minute fibrous roots of trees (the *chevelu* of the French writers) have been pronounced by them, and by all the naturalists of this country, who have written upon the subject, to be, like the leaves of deciduous plants, annual productions only: and such is the opinion of Duhamel, or rather his decision respecting facts within his own observation; for he rarely, if ever, favours his readers with his opinions. If the fibrous roots of plants, which have, like the Strawberry plant, the whole habits of trees, be annual productions only, any effort

to preserve them through the winter must be useless; but I deny the fact of their being annual productions only; and I contend that whenever they are found wholly lifeless round the surface of the mould of the pots, as they often are after unfavourable winters, the growth and produce of the plants in the succeeding season will be much diminished.

The mode of management, which I have adopted, and which it is the object of the present communication to recommend, is the following.

I manure a small piece of ground very highly, but very superficially, just covering the manure with mould; thus deviating widely from my ordinary practice of putting the manure deep in the soil to occasion the roots to descend deep, that they may be enabled to supply proper moisture in dry weather. The ground being prepared, the strongest and best rooted runners of the preceding year are selected and planted in rows, one foot apart, in the beginning of March. The distance between each plant is eight inches in one half the rows, and four inches only in the other half, the thickly and thinly planted rows occurring alternately. In July all the plants of the thickly planted rows are removed to ground that has produced an early crop of peas or potatoes; and these, having their roots well preserved, always afford me an abundant crop of fruit in the following summer. The other plants remain unnoticed till the end of November, when the mould between the rows is removed with the spade, and the most widely extended lateral roots detached from it. The spade is also made to pass under each plant, and between it and the next adjoining, so that each plant becomes capable of being removed at a subsequent period without having any

of its roots ruptured; and the whole of these should be preserved as entire as is practicable. As each plant becomes detached from the surrounding soil, the ground is closed around it, and it remains till it is wanted; but it should be placed in its pot as early as the middle of February, if it be not sooner removed. At this period innumerable radicles will be seen to spring from the sides of the older roots, and these readily extend themselves into any proper soil that is placed in contact with them. I always employ soil of the richest quality, and very finely reduced; and a good deal of water, holding manure in solution, is employed to occasion the newly introduced soil to occupy all space previously vacant in the pots. The plants are then in a state to be subjected immediately to artificial heat.

Having denied, in opposition to the generally received opinion, that the slender fibrous roots of trees and plants, having the habits of trees, are of annual duration only; and the subject being of much importance to the gardener, I will state a few facts in support of my opinion. That many of the fibrous roots usually perish in winter I admit; but under favourable circumstances I have seen a very large portion perfectly alive and growing in the spring; and in the last year I tried the following experiment, the evidence of which is, I think, conclusive. Having observed that Fig-trees of some varieties are capable of ripening their fruit in much higher temperature than others, I thought it expedient to try whether the same variation of power to bear different degrees of temperature did not exist in varieties of other species of fruits. Young plants of different new varieties of Nectarines were therefore placed in the stove in the spring of 1823,

where they grew well till Midsummer, after which all, except one, indicated, by shedding prematurely their full grown young leaves, the presence of excess of temperature. One tree, whether owing to any peculiarity of the constitution of the variety, or other cause, remained in full health till the end of the summer; when its wood and foliage, having become perfectly mature, and the latter beginning to turn yellow and fall off, it was removed, in September, to the open wall. In this situation it remained till the middle of December, its roots having been purposely carefully guarded from injury either from excess of moisture, or of frost. In December, owing to the high excitability the plant had acquired by the treatment to which it had been previously subjected, its buds shewed much disposition to vegetate; and it was consequently taken from the pot to the situation it was intended permanently to occupy.

Supposing the minute fibrous roots of a plant, thus treated, to be, like its leaves, organs of annual duration only, they ought in this case to have wholly ceased to live; but on the contrary, I found them all alive, and all in the act of elongating. The evidence in this and in many other cases, of the fibrous roots continuing to live and vegetate in a second season is positive; that of my opponents is wholly negative, and a little positive evidence in this, as in all other cases, is more than equivalent to a great deal of negative evidence. I must therefore conclude, in opposition to the opinion of those whom I am much disposed to treat with deference, that the preservation of the minute fibres of plants is important, and I believe almost every experienced gardener will coincide with me.

LXIX. *On* Transplanting Peas for Early Crops. *In a Letter to the Secretary.* *By Mr.* Daniel Judd, *F. H. S.*

Read March 16th, 1824.

Sir,

In looking over the last part of the *Transactions,** I observe that Mr. Knight has written on the *transplanting of Peas,* I beg leave to offer a few hints on the same subject, which may perhaps convey some additional information.

It has been an invariable rule with some of the old gardeners in this neighbourhood for many years, to transplant their first crops of early Peas. I have been in the habit of doing so for thirteen years, very successfully, with my first early Peas, and also with my first large late Peas.

Mr. Knight's method of sowing is superior to ours; we have not paid attention to the compost or to sowing them in circles in the pots, but our practice is very simple; the compost we use is as free from rotten dung as we can get it, the Peas are sown generally all over the surface, and the pots are placed either in cool frames or in moderate heat, as may be deemed necessary.

The time of sowing depends on the season, the earliest is about the middle of January; at the time of planting, the ground which has laid in ridges during the winter is first levelled down, and trenches are then cut through it by line, somewhat sloping, in the same way as for planting Box, and

* Volume v. page 341.

deep enough to admit the roots of the plants without bending them. The Peas are turned out of the pots, and about two inches of the bottoms cut off before the plants are separated, and in parting them care is taken to keep them in tufts of about four or six, laying them into the trenches, and filling up with the natural mould, if dry enough; but if not, with some mould which has been kept dry. I have now one long row of the Frame Pea, planted, as described, on the third of last month, which is three inches high, while another by the side of it, sown in the natural way, and which had made its appearance above ground before the others were planted, are very little more than one inch high.

Mr. Knight recommends poor light soil for transplanted Peas, but I differ from him by experience; for when I have planted Peas without manuring the border, my crop has been very inferior: I find when transplanted Peas do not thrive well, that they are very apt to bring small pods, not half filled.

I remain,

your humble and obedient servant,

Edmonton,
March 1st, 1824.

Daniel Judd.

Note by the Secretary.

In the latter part of the above communication, Mr. Judd seems to have mistaken the President's meaning, and with the following explanation no difference of opinion will perhaps appear to exist.

Mr. KNIGHT's object in surrounding his transplanted Peas with a poor and light soil, is to check the luxuriance of growth, and consequently to induce early maturity. The quantity of produce would certainly be increased by using a rich soil, as proposed by Mr. JUDD, but this increase would be at the expense of the earliness of the crop, which is the main point to be gained by the practice recommended.

LXX. *Some Account of the* Edible Fruits of Sierra Leone. *Drawn up by* JOSEPH SABINE, *Esq. F. R. S. &c. Secretary, from the Journal and personal Communication of Mr.* GEORGE DON, *A. L. S.*

Read March 18th, 1823.

THE cultivation of *Tropical Fruits* being one of the subjects, to which it was proposed that the attention of the Horticultural Society, on the establishment of its Garden at Chiswick, should be directed, the various Collectors employed in its service, were instructed to embrace every opportunity which might occur of procuring the most accurate information regarding plants of this description; and, in addition to seeds and living plants, not only to get dried specimens of the blossoms and leaves, prepared in the usual manner; but, in order to enable persons resident in this country to form a more perfect conception of their nature than verbal or written information would convey, to transmit home a sufficient quantity of the ripe fruits, preserved in spirits.

A visit to the colony of Sierra Leone formed part of a voyage undertaken last year by Mr. GEORGE DON, with the general object of collecting plants and seeds; it fortunately happened that his residence, though short at that place, occurred in the season, when the fruits were for the most part in perfection; the materials, consequently, which he obtained are such as to enable me to lay before the Society a more ample account of them than has hitherto been given to the public.

The chief knowledge which was previously possessed on the subject is derived from the *Report* made by Professor Adam Afzelius to the African Society, in the year 1794. The *Botanical Appendix* to the account of the Expedition to the Congo, under the command of Captain Tuckey, drawn up by Mr. Robert Brown in 1818, furnishes much information respecting the vegetable productions of the part of Africa in the vicinity of that river, and where they are the same as those of Sierra Leone, has been of important use in making out the account of Mr. Don's collection.

It will be observed, that though some of the fruits recorded by Afzelius, seem to have escaped the observation of Mr. Don, he has not only made us acquainted with several valuable kinds, not included in that writer's Report, but has added much information respecting others which were very imperfectly known. It is also not impossible, that it may be hereafter ascertained that plants mentioned in the Report, which are now supposed not to have been seen by Mr. Don, may have been actually obtained by him, but under names different from those which have been applied to them in that publication. The difficulty, however, of procuring flowering specimens of some of the fruits which are brought to market by the natives, from places not visited by Europeans, is so great as even now to render it impossible to ascertain the species of the trees which produce those kinds.

Mr. Don arrived at Sierra Leone on the 18th of February, 1822, and quitted the Colony on the 11th of April following. He then proceeded along the coast to the southward, and on the 17th of May landed on the island of St. Thomas, where he remained nearly a month, and in that island also formed a

very interesting collection of specimens, which will be the subject of a future communication.

In the preparation of the following notices, I have derived most essential assistance, in almost every article, from the information of Mr. Robert Brown; without that aid the account would have wanted those elucidations and explanations which his profound knowledge and research alone could supply, and which have given interest to some of the subjects far beyond what I anticipated or hoped for, before I obtained his promise of co-operation.

I have endeavoured to make the descriptions of the plants as simple as possible, avoiding minute botanical details, such general characters only being given as will enable the cultivator to recognize the plants under his care, or the future collector to distinguish them in their native places. In the course of the examination of the specimens, several curious and novel productions have been discovered, the accounts of which will be particularly interesting; but as they are strictly botanical, they have been reserved for publication in a separate shape, in the *Transactions of the Linnæan Society*, and will be exclusively from the pen of Mr. Brown.

Many of the plants have proved to be hitherto unknown or undescribed species, some of them belonging even to new genera. The materials of others have not proved sufficient to justify either the adoption of an old or the application of a new generic name for them; consequently in those cases the vernacular appellations alone are prefixed. Where generic or specific names before used are added, the original authority for them is in all instances quoted, so that where references

of that description are wanting, it will be understood that the names so circumstanced are new.

FRUITS OF SIERRA LEONE AND ITS VICINITY.

SARCOCEPHALUS. *Afzelius, MSS.*

PEACH *of the Negroes.* SARCOCEPHALUS ESCULENTUS. *Afzelius in Herb. Banks.*

This is a large fleshy fruit of the size of a full grown Peach. It is solitary, and grows at the extremity of the branches. Its surface is brown, and granulated. The core is solid and rather hard, but edible, much resembling the centre of a Pine Apple in substance, and occupying, in a large fruit, about one-fourth of the diameter. The surrounding flesh is softish, full of small seeds, in consistence and flavour much resembling a Strawberry.

The tree grows plentifully in low places over the country generally, and is from ten to fifteen feet high, bearing many spreading dichotomous branches. The leaves are large, deep green, opposite, and elliptical. The flowers are small, disposed in globular heads on a fleshy receptacle, which, with the confluent germens, afterwards become the fruit. The corolla is pale pink with five divisions, it has five stamina, and the pistilla, which project much, are a brownish pink.

The specimens obtained by Mr. DON have enabled Miss COTTON to make a drawing of a branch in flower and fruit, from which the accompanying engraving has been taken; a representation of the section of a small fruit has also been given, which will aid the above description, by conveying a more perfect idea of its appearance

Sarcocephalus esculentus.

Plants of the Sarcocephalus esculentus have been raised from seeds sent home by Mr. Don; it grows vigorously in the stove, and is readily increased by cuttings.

The Genus Sarcocephalus is nearly related to Nauclea, and our plant was named in the Banksian Herbarium by Afzelius; he called it in his *Report* the Country-Fig,* which is surely a more appropriate name than that which Mr. Don states to be its current appellation at present in the colony. It appears to be not uncommon on the banks of the Congo.†

Anona. *Linnæus.*

African Custard Apple. Anona Senegalensis. *Persoon.*

The fruit is smaller than that of the American Custard Apples, being not much larger, when full grown, than a pigeon's egg; its flavour resembles that of other fruits of the genus, but is superior to most of them.

The trees, which are found on small rising grounds, especially on the hill immediately adjoining Free-Town, on which a Martello tower is built, usually grow from twelve to fifteen feet high; the branches are numerous, and covered thickly with rounded, oblong, emarginate, glaucous leaves of a moderate size, and pubescent underneath. The flowers are greenish, and somewhat smaller than those of the common Custard Apple.

This species is not confined to the neighbourhood of Sierra Leone, it is found at Senegal, as its name implies, and also on the banks of the Congo.† It is not noticed by Afzelius.

* Afzelius's Report, page 236, No. 32.

† See Brown on the Congo Plants, page 467.

Adansonia. *Linnæus.*

Monkey Bread. Adansonia digitata. *Linnæus.*

The trees of this species which were seen by Mr. Don did not exceed a large Apple-tree in size, though their dimensions in other places are usually reported as very great. The fruit, which is of considerable size, and of an oblong shape, is much used by the Negroes; it contains a farinaceous pulp full of seeds, which tastes like gingerbread, and has a pleasant acid flavour. The species is not so common at Sierra Leone as it is in Senegal, and some other parts of the coast. Being so well known, further description of it is unnecessary. Plants of it were sent home in a living state by Mr. Don, and grow well in the bark stove at the Garden of the Society.

Inga. *Willdenow.*

Locust Tree, *or* Néty *of the Negroes.* Inga biglobosa. *Willdenow.*

This is a beautiful tree, when in blossom, being then covered with compact biglobular heads of fine vermillion coloured flowers, which have been well figured in the *Flore d'Oware** of the Baron de Beauvois, except that they should have been represented as pendulous, not upright. It grows in the low lands a few miles from Free-Town, but is not very abundant.

The tree is large, having spreading branches which are thickly covered with alternate, bipinnate, rather downy leaves. The pods which succeed the blossoms grow in compact bunches, and contain a yellow farinaceous substance (enve-

* Vol. ii. plate 90, page 53.

loping the seeds) of which the Negroes are fond, its flavour being similar to that of the Monkey bread. Plants of the Néty tree have been raised in the Garden of the Society from seeds sent home by Mr. Don.

It is the same as that mentioned by Park, in his account of his first Journey into the interior of Africa,* as a Mimosa called by the Negroes *Nitta*, which furnished a nutritive and agreeable food from its seed pods, and as being abundant near the town of Manna.

Country Cherries.

It is probable that the fruit seen by Mr. Don, under the above name, is different from that called the Country Cherry† by Afzelius, who compares it to a fine Nectarine; or if it should be the same, it is by no means deserving of the praise bestowed on it by that writer. The tree is found in the mountains, though very rarely; it is of considerable size, growing to the height of forty feet or more; it has large dark green pinnated leaves. The fruit is oval, about equal to a good sized Gooseberry, and is of a reddish colour, in flavour somewhat similar to a common Plum; it is produced in clusters, from the extremities only of the topmost branches of the tree.

Specimens of the fruit, but without either leaves or flowers, were preserved by Mr. Don, and the character of that is hardly sufficient to enable us to determine its place in the general system; it seems to approach to Jussieu's order of Terebintaceæ, and may perhaps be related to Canarium.

* First Edition, page 337.

† See Afzelius's Report, page 238. No. 45.

Anisophyllea. *Brown MSS.*

Monkey Apple. Anisophyllea laurina.

Neither flowers or fruits of this plant were sent home by Mr. Don, and the seeds which were received from him did not vegetate. Specimens, however, were fortunately in the possession of Mr. Brown, on which the blossoms were perfect, and the fruits nearly full grown; by these the account of the species has been rendered more complete than it otherwise could have been. The fruit is sold in the markets of Sierra Leone in the months of April and May, and it is described by Mr. Don as being superior to any other which he tasted in Africa. It is of the size and shape of a pigeon's egg, red on the sunned side, yellow on the other, its flavour something between that of the Nectarine and a Plum.

Mr. Don conjectures it may be the same as Afzelius's Cherry, which, as has been above stated, is supposed to be different from what is now known by that name in the colony. The flowers are small and numerous, growing on a spike; a few only of them however become perfect fruit. The tree grows from forty to fifty feet high, its leaves exhibit a very peculiar arrangement, at first sight they seem alternate, but upon closer examination minute linear acute stipula-like leaves are discerned nearly opposite to the larger ones, these last are elliptical, oblong, and deeply five-nerved. The whole appearance and aspect of the tree has a strong resemblance to a laurel. It grows in the mountainous parts of the country.

Vitis. *Linnæus.*

Country Grapes. Vitis Cæsia. (Cissus cæsius.) *Afzelius.*

This a climbing, and in some degree, herbaceous plant, with roundish cordate leaves, downy underneath, the margins of which are delicately toothed, having the appearance of being edged with fine hairs; the stems are round and glaucous; the berries grow in small axillary bunches; they are round and black, with an austere acid taste not very agreeable to Europeans, and are chiefly eaten by the Negroes, who are fond of them.

This species grows in open low situations, and bears good crops of fruit. It is mentioned by Afzelius.* Plants which were sent home by Mr. Don from Sierra Leone, are in the Garden of the Society, but have not yet produced flowers.

Country Currants.

Mr. Don states that this fruit grows in great abundance in racemes on the branches of a very slender shrub; the berries, in size and taste, resembling those of the Elder. The plants are found plentifully in the mountains. No specimens were sent home, but from the description given, it is supposed to be an Antidesma, of which a species is also enumerated† among the Congo plants. Afzelius mentions‡ an Antidesma in his *Report,* which bears fruit of the

* See Afzelius's Report, page 237, No. 35.

† See Brown on the Congo Plants. page 469.

‡ Afzelius's Report, page 238.

same taste as Red Currants, but whether it be the same as Mr. Don's plant cannot be ascertained.

Ficus. *Linnæus.*

Large Fig. Ficus Brassii. *Brown MSS.*

The shrub which is now to be noticed, bears fruit about as large as that of the White Ischia Fig, it would be always pleasant, was it not that the ants frequently attack it, and getting within it render it unfit for use. The plant grows in low places, on the flat grounds round Sierra Leone, and it is also to met with in the mountains. The branches grow upright, and bear numerous large oblong pointed leaves, smooth on both sides, the margins are marked with very wide dentations. The fruit is produced abundantly on the old wood. It was not observed in the market by Mr. Don. Plants raised from seed sent home by him grow freely in the stove. Specimens of this Fig were sent from Cape Coast by Mr. William Brass,* and are in the Banksian Herbarium; the specific name given to it is in compliment to him.

Small Fig.

Fruits of another species of Ficus were received from Mr. Don, less than the preceding, but nearly as large as a small sized Walnut. These are also injured by the attacks of the ants, which destroy whatever excellence they possess. Specimens of the plant were not sent home, but it is described as

* Mr. Brass was resident on the Western Coast of Africa in the years 1782 and 1783; he was sent out as a collector of plants at the joint expense of the late Lord Tankerville, Dr. Pitcairn, Dr. Fothergill, and Sir Joseph (then Mr.) Banks.

a small shrub, about two feet high, with rounded, rugose leaves, growing mixed with the larger species.

Afzelius* mentions a Fig-tree producing fruit the size of a Hazel nut, and also notices that it is liable to destruction by the ants.

Psidium. *Linnæus.*

Wild Guavas. Psidium pyriferum?

Guavas are mentioned by Afzelius,† as growing in the settlement of Sierra Leone, but it is not stated by him whether they are the same with any of the kinds which are common in the West India Islands. No dried specimens of the plants now noticed were sent home, nor was any of their fruit preserved in spirits; they grow in marshy spots on the side of the Sierra Leone river, attaining a height of from ten to fifteen feet, and bear abundantly. Mr. Don describes the fruit as greenish yellow on the outside and red within, somewhat resembling, though of a smaller size, the common Guava of the West Indies (Psidium pyriferum), and in his opinion inferior to it in flavour. The plants which have been raised from the seeds received from Mr. Don, though very similar in appearance to the Psidium pyriferum, do not exactly agree with it, the leaves of the African plant being smaller and narrower. They may possibly prove to be a distinct species, which cannot be determined until they shall have attained a size sufficient to enable us to make a due comparison of the two plants; at present it seems safest to consider that now described as a variety only of the Psidium pyriferum.

* Afzelius's Report, page 236.

† Ibid. page 233. No. 13.

SPONDIAS. *Linnæus.*

HOG PLUM OF YELLOW PLUM. SPONDIAS MYROBALANUS. *Linnæus.*

The tree which yields this fruit grows naturally in the mountains, and has been planted in the low grounds by the settlers, on account of its produce; it is also cultivated in the town; it grows about fifty feet high, and has much the appearance of a common Ash. This has also been observed by AFZELIUS.* The leaves are pinnated and of a pale green colour. The flowers are small, white, growing in clusters at the extremity of the branches; they are succeeded by the fruit, which is the size of a walnut, of an oval shape and yellow colour, its flesh is tender, much resembling that of the common Plum of our gardens, both in appearance and flavour, though perhaps it has more acidity. The stone forms half the entire bulk of the fruit. The specimens received, though not perfect enough to ascertain the species, are sufficient to enable us to decide that it is a Spondias. Mr. DON is disposed to consider it distinct from Spondias Myrobalanus of LINNÆUS, and would therefore call it S. Leona, as indicative of its native country. On reference however to AFZELIUS's *Remedia Guineensia*,† we find the Spondias Myrobalanus described there as a native of the Sierra Leone district; and his description is so accordant with the plant found by Mr. DON, as to leave little doubt of their identity.

* AFZELIUS's Report, page 237. No. 33.

† Page 53.

Afzelius, in addition to the Hog Plum, gives* the vernacular names of seven kinds of what he calls Country Plums, but without assigning characters or descriptions to any, and he adds that there are many more not particularly known. Mr. Don enquired for the plants by the names alluded to, but they do not now appear to be in use in the colony. He met with five distinct kinds, besides the Hog Plum, which are successively described in the following articles, and may possibly be referable to some of Afzelius's obsolete names.

Parinarium. *Jussieu.*

Rough-skinned or Gray Plum. Parinarium excelsum.

The tree which bears the fruit of this name is one of the largest on the Sierra Leone mountains, to which it is confined. When in flower, its terminal bunches of white blossom render it a peculiar ornament to the forest. The younger branches are covered with minute white spots. The foliage is striking, from the contrast of the colour of its two surfaces, the upper being dark green and the under nearly white from pubescence; the leaves are oblong, alternate, rather coriaceous, of moderate size and thickly disposed on the branches. The fruit is greatly esteemed by the Negroes, and is plentifully supplied in the markets; it is produced in the greatest abundance, and is about the size and shape of an Imperatrice Plum, with a coarse skin of a grayish colour; the pulp is dry, farinaceous, and, owing to the size of the stone small in quantity, with an insipid taste. The wood of the tree is very compact and durable, and is applied to many

* Ibid. No. 34. 1st. Besabis. 2d. Drap. 3d. Abooke. 4th. Machai, or Mackanter. 5th. Magint. 6th. Malinta. 7th. Wanibé.

useful purposes. Plants raised from the seeds sent home by Mr. Don, are growing in the Garden of the Society.

The genus to which this plant is referred is the same as the Parinari of Aublet. It is also the Petrocarya of Schreber and Willdenow.

Gingerbread Plum. Parinarium macrophyllum.

A fruit of an oblong form, twice the size of the rough-skinned Plum, but otherwise resembling it, both in flavour and appearance, produced by a shrub from two to three feet high, was seen by Mr. Don. Specimens of branches, with blossoms, were received from him, but he did not send home any of the fruit in spirits. On reference to the Herbarium of Sir Joseph Banks, this is found, by a note annexed to a specimen of the plant preserved there, to be a fruit called in the colony Gingerbread, which is not however noticed by Afzelius in his *Report*. The plant grows plentifully on the sea shore near Cape Shilling, which is upwards of thirty miles distant from Free-Town, and was not seen elsewhere. The fruit is not sold in the markets of Sierra Leone, which will account for the circumstance of the name applied to it being unknown to Mr. Don. The identity of the two specimens was pointed out by Mr. Brown. The shrub is so particularly handsome, that it would be a valuable addition to our stoves; its leaves are alternate, numerous, very large, ovate, sessile and cordate, darkish green above and downy underneath; the stems are covered thickly with brown hairs, and produce large clusters of white flowers at their extremities.

Chrysobalanus. *Linnæus.*

Small Pigeon Plum. Chrysobalanus ellipticus. *Solander in Herb. Banks.*

The Pigeon Plum seen by Mr. Don is a fruit about the size of a large Damson, but round, the skin being of a black colour, and the flesh in flavour resembling the Icaco Plum of the West Indies, with a stone half of its size. The tree which produces it grows plentifully by the sea side, the whole way between Cape Sierra Leone and Cape Shilling, attaining a height of ten or twelve feet, and branching much; its leaves are of a middle size, alternate, elliptic, obtuse, coriaceous, and very entire, with short petioles, the flowers are white and small, produced in axillary clusters, each having eight or ten blossoms, and bearing afterwards from two to three fruits. The Pigeon Plum of Afzelius* is considered by him the same as the Icaco Plum (Chrysobalanus Icaco) of the West Indies, but Mr. Don did not observe the fruit or see the trees of that species at Sierra Leone.

The Chrysobalanus found by Professor Smith on the banks of the Congo is probably the same as the Pigeon Plum of Afzelius, and is stated by Mr. Brown† to be hardly distinguishable from the American Icaco; it is however widely different from the plant now described.

Yellow Pigeon Plum. Chrysobalanus luteus.

Besides the preceding, Mr. Don gives an account of another fruit belonging to the same genus, about the size and figure

* See Afzelius's Report, page 238.

† See Brown on the Congo Plants, page 434,

of an Orleans Plum, but still rounder than it, and of a yellow colour, with a stone half its size, the flesh being very soft and juicy, the flavour having much resemblance to that of Noyau. Neither specimens of the plant nor of the fruit were received. The tree has a striking similitude in appearance to the common Lime (Citrus Limonum), it grows very plentifully on the sea shore, not only at Sierra Leone, but in the other parts of the western coast of Africa, visited by Mr. Don.

Sugar Plum.

This fruit is sold in great quantities in the markets of Sierra Leone during the months of March and April; the tree which produces it is lofty, its stem is quite clear of branches to the height of sixty feet and upwards, where it terminates in a fine head. The leaves are of considerable size, obovate, attenuated at the base, and supported on long footstalks. The fruits grow singly in the axillæ of the leaves, and are supported by short, thick woody peduncles; they are the size of a Bullace Plum, round, rough on the outside with scattered warts, and half filled by three or four hard, oval, flattened seeds; they are sweet, of an agreeable flavour, and may be considered as one of the best fruits of the country. It is difficult, from the absence of materials, to decide upon the affinities of this plant; the specimens which were sent home being without blossoms, though plenty of the fruits were preserved in spirits. No name consequently is attached to it beyond that by which it is known in the markets of Sierra Leone. In one remarkable respect it is similar to some other plants, to which it however bears no further resemblance; it is stated by Mr. Don, that it throws out roots from its stem from the height of

upwards of ten feet, like a Mangrove or a Pandanus, by which singular character it may be distinguished at a considerable distance. It grows generally on the banks of rivulets, but it is occasionally found in the mountains also; in the last situations, however, it has not the same tendency to produce roots from its stem as in moist shady places. Its wood is soft, and not used for any purpose.

Vitex. *Linnæus.*

Black Plum. Vitex Umbrosa.

A large tree of this species grows in one of the streets of Free-Town; it resembles a Horse Chestnut in its foliage and general appearance; its blossoms are produced in a moderate sized panicle, but are not larger than others of the same genus. The fruit ripens in August, and consequently, was not seen by Mr. Don, but he was informed that though eatable, it was inferior to both the Sugar and Yellow Plums. No tree of the kind besides the one alluded to, was seen in any other place. The specimens which are preserved, enable us to ascertain the genus to which it belongs; the specific name is indicative of the character of the tree.

Carpodinus. *Brown MSS.*

Sweet Pishamin. Carpodinus dulcis.

This is a climbing shrub with opposite, entire, oblong, lanceolate, pointed leaves, supporting itself by its tendrils, upon any other plant near which it grows, but especially upon Anona Senegalensis. The fruit is yellow externally, in size

and appearance resembling a Lime, growing pendulous, almost sessile, and singly or in pairs from the axils of the leaves; when broken or cut it yields a quantity of sweet, milky juice. The pulp, in which many large seeds are found, is also agreeable and sweet. It was observed growing plentifully on the Martello-tower hill, near to Free-Town, but was not seen elsewhere. Specimens were sent home by Mr. Don, of branches with leaves, and of the ripe as well as green fruit; the deficiency of blossom has been supplied from Mr. Brown's Herbarium, in which it is considered as belonging to a new genus, named as above by him. It is nearly allied to Melodinus.

Sour Pishamin. Carpodinus acidus.

A climbing shrub of more straggling habit than the preceding, but very similar in character and appearance, producing its fruit in greater abundance, was noticed by Mr. Don; it is however of very rare occurrence, for he observed only two plants of it; these grew by the side of a rivulet in the mountains. The fruit is smaller and more round than that of the Sweet Pishamin, and has a sharp acid taste, with some little bitterness, which prevents it being agreeable; it is however much liked by the natives. Specimens of the fruit only were sent home by Mr. Don, but it being his opinion that the plant is specifically different from the preceding, it has been distinguished by a name indicative of its peculiar flavour.

The name of Pishamin given by the settlers to the two preceding plants is taken from the common American appellation of the Diospyros Lotus.

Mammea. *Linnæus.*

Mammee Apple. Mammea Africana.

This is different from the Mammee (Mammea Americana), of the West Indies; it grows in the thickest parts of the woods on the mountains of Sierra Leone; it is a lofty tree, with very pointed leaves of a dark green colour. Its wood is applied to many useful purposes. This fruit is mentioned by Afzelius in his *Report*;* it is twice the size of a man's fist, and as large as the West India kind, but more pointed, and of equal excellence.

Pentadesma.

Butter and Tallow Tree. Pentadesma butyracea.

This tree is not uncommon in the low lands round Sierra Leone; it occasionally grows to a great heighth, but produces its flowers when thirty or forty feet high. The fruit is about the size of the Mammee Apple described above, inversely pear-shaped, being pointed at the apex; it contains from three to five large angular seeds; the coat is rough, coarse, and of a dark brown colour. The yellow greasy juice, from which the tree derives its vernacular name, is given out copiously when the fruit is cut or opened; it is mixed by the natives with their food; but is not however much used by the settlers on account of a strong turpentine flavour which belongs to it; this juice is more abundant in the seeds than in the other part of the fruit. The tree was noticed by Afzelius.† Specimens of the blossoms were not seen by Mr. Don, but from the remains attached to those of the fruit sent home, as well as from a flower in the possession of Mr. Brown, they appear

* See Afzelius's Report, page 328, No. 39. † Ibid. page 234. No. 29.

to be large and showy. The leaves are entire, lanceolate and coriaceous. The plant seems impatient of cultivation in this country, for those which were raised in the Society's Garden in 1822, from seeds sent home by Mr. Don, have not lived. It was not observed* in the expedition to the Congo under Captain Tuckey.

The generic name is derived from the disposition of the stamina of the flower, which are united into five distinct bundles; the specific name from the quality of the fruit.

Chrysophyllum. *Linnæus.*

Long-leaved Star Apple. Chrysophyllum macrophyllum.

This is a very tall tree, producing valuable wood, and growing both in the low lands and mountains, and particularly amongst thickets in the latter. Its leaves are very long and lanceolate, with a ferruginous tinge underneath. The fruit was not ripe during the time Mr. Don was resident in the colony, but he learned that it was in request.

Obovate-leaved Star Apple. Chrysophyllum obovatum.

This species of Star Apple is a small spreading tree, which does not exceed thirty feet in heighth; and has moderate sized obovate entire leaves, silvery white underneath. It grows only in the mountains. The fruit, which was tasted by Mr. Don, is of the size of a moderate Apple, with a sharp apex, much inferior in flavour to the Star Apple (Chrysophyllum Cainito), of the West Indies, but yet agreeable.

The Cainito of Afzelius† is referable to one of the above Star Apples, possibly to the first.

* See Brown on the Congo plants, page 474.

† See Afzelius's Report, page 238.

Tonsella. *Schreber.*

Tonsella Pyriformis.

A plant belonging to the natural order of Hippocraticeæ, and to the genus Tonsella, was observed by Mr. Don, but he could not ascertain its native name, though the fruit, of which he sent home specimens, had extraordinary merit; it was about the size and shape of a Bergamot Pear, with divisions corresponding to the number of the seeds, which are usually three; its flavour was very rich and sweet. The plant grows in elevated places at some little distance in the interior from Free-Town; it is a small shrub with oblong leaves, which have very minute distinct teeth in their margin, and bears axillary clusters of small greenish flowers. Tonsella Africana* of Vahl seems to be a very nearly related species.

Pomegranate.

A large tree growing on Leicester Mountain, with a Platanus-shaped leaf, was pointed out to Mr. Don as bearing a fruit known by the above name, though certainly not referable to the genus Punica; it was said to be very excellent. No specimen of the tree (which was neither in flower nor fruit at the season Mr. Don saw it), was received.

Sterculia. *Linnæus.*

Cola. Sterculia acuminata. *Palisot de Beauvois.*

The seeds of the Sterculia acuminata are known by the name of Cola among the Negroes, and are held in great estimation by them, being considered to possess the same virtues as Peru-

* Willdenow Species Plantarum, Vol. i. page 194. Vahl Enumeratio, Vol. ii. page 30.

vian bark. The pods grow together, from two to five in number, they are rarely single, and each pod contains one or two seeds, somewhat resembling the seeds of the Horse Chestnut.

Two varieties were seen by Mr. Don, one producing white and the other red seeds, the latter is the only one before noticed. The Sterculia acuminata is common along the whole African coast; it was found* by Professor Smith on the Congo, and is figured in the *Flore d'Oware*† by the Baron de Beauvois, who gives in that work long details respecting its history, and its property of giving an agreeable flavour to water. The tree is of considerable magnitude, with oblong pointed entire leaves standing on long petioles, and bearing its flowers in terminal and axillary panicles.

Tola.

Seeds the produce of a tree are brought to the markets from a distance, under this name, and are used in the same manner as the Cola; they are long and narrow, somewhat pointed at each end. The plant was not seen. Afzelius, in his *Remedia Guineensia*,‡ briefly notices the Tola seed, which he supposes to belong to a leguminous plant.

Codarium. *Vahl.*

Velvet Tamarinds. Codarium acutifolium. *Afzelius.*§

This fruit is called the Velvet Tamarind, on account of the dark glossy surface of the pods; the farinaceous substance contained in them is used as food generally, and has an agreeable acid taste. The trees grow plentifully in low places

* See Brown on the Congo Plants, page 467.

† Flore d'Oware, Vol. i, page 41, plate 24. ‡ Page 61.

§ See Afzelius's Genera Plantarum Guineensium, Part I. page 23.

near Free-Town; they are of a moderate size, about twenty feet high with slender branches, having pinnated leaves with from five to seven oblong, lanceolate, pointed, entire, and rather coriaceous pinnæ. The flowers are small, pale red, and are produced on large diffused terminal panicles. The seed pods are the size of a small compressed nut, and are covered with a beautiful black velvety down.

Brown Tamarinds. Codarium acutifolium *Var.* ?

Branches of another Codarium, bearing pods very similar in appearance to those of the Velvet Tamarind, but larger and flatter, with more acidity in the farinaceous matter contained within them, and having their coat more brown and less velvety, were sent home by Mr. Don, but without specimens of either leaves or blossoms. The trees producing them grow in the same places as the Velvet Tamarind trees, and the two kinds are stated by Mr. Don to be similar in character and appearance. From the materials supplied, it cannot be ascertained whether they are a distinct species or only a variety of the Codarium acutifolium; the latter is more probable. Afzelius mentions* Brown Tamarinds as well as the Velvet Tamarinds, which are possibly identical with those recorded here, with corresponding names.

Bromelia. *Linnæus.*

Pine Apples. Bromelia Ananas. *Linnæus.*

Afzelius† says that Pine Apples grow wild, and are also cultivated by the natives. Mr. Don states that they are so

* See Afzelius's Report, page 236. No. 30.

† Ibid, page 234. No. 21.

abundant in the woods as to obstruct the passage through them in every direction; they grow vigorously, and bear fruit abundantly.

The profusion in which those plants are found both in frequented and unfrequented places, sanctions the opinion which is commonly entertained in the colony, that they are not of foreign origin, but indigenous inhabitants. This is contrary to the doctrine of scientific botanists, who hold that Pine Apples have been carried from America into Africa and Asia; yet it is difficult to conceive how such an exotic should have so established itself as to have assumed all the habits and characters of a native in those regions, and more especially that it should have sported in them into varieties (as is the case more particularly in parts of Asia) so remarkably different from any that are known to exist in the countries, of which alone they are supposed to be the original inhabitants.

Two sorts of Pine Apples are cultivated by the colonists, at Sierra Leone, one called the White, and the other the Black Pine Apple; they are not so large as those produced in England, but have a superior flavour. The Wild varieties are numerous. A very pleasant kind of wine is made in the colony from the juice of this fruit.

The preceding are all the fruits which appear to have come under the observation of Mr. Don during his visit to Sierra Leone; that his exertions in obtaining them were considerable will be evident, from the following comparison of the results of his labours, with the subjects enumerated in the *Report* made by Dr. Afzelius, who resided in the country several years.

The wild fruits recorded by Dr. Afzelius, and which were also seen by Mr. Don, either under the same names, or with other names which can be satisfactorily attached to them, are the following.

1. The Sarcocephalus Esculentus is the Country Fig of Afzelius.
2. The Country Cherries of Afzelius are conjectured by Mr. Don to be his Monkey Apples.
3. Country Grapes.
4. The Antidesma of Afzelius is perhaps the tree which produces Mr. Don's Country Currants.
5. The small Fig-tree.
6. The Guavas of Afzelius are the Wild Guavas of Mr. Don.
7. Hog Plum or Yellow Plum.
8. Mammee Apples.
9. Butter and Tallow Tree.
10. The Cainito of Afzelius may be taken for the first of Mr. Don's Star Apples.
11. Cola. The varieties are not distinguished by Dr. Afzelius.
12. Velvet Tamarinds.
13. Brown Tamarinds.
14. Pine Apples. Dr. Afzelius does not mention the two varieties noticed by Mr. Don; he only speaks generally of the fruit as being found wild as well as cultivated.

The following fruits of Mr. Don must for the present be considered as distinct from any noticed by Dr. Afzelius.

1. African Custard Apple.
2. Monkey Bread.

3. Néty Tree of the Negroes.
4. Country Cherries of Mr. Don.
5. The large Fig; also the other kinds, with the exception of one small Fig.
6. Rough Skinned or Gray Plum.
7. Gingerbread Plum.
8. Small Pigeon Plum.
9. Yellow Pigeon Plum.
10. Sugar Plum.
11. Black Plum.
12. Sweet Pishamin.
13. Sour Pishamin.
14. Star Apple, the second species; the first being supposed to be Afzelius's Cainito.
15. Tonsella Pyriformis.
16. Pomegranate.
17. Tola. This appears, however, to have been known to Afzelius,* though not mentioned in his *Report*.

The following are the names of the fruits mentioned by Dr. Afzelius which are still either to be discovered and ascertained as distinct, or what is more probable, (as to part of them at least), which may be reduced to some of those of the preceding list, considered to have been noticed by Mr. Don, but omitted by Dr. Afzelius.

1. White Tamarinds.
2. Massino, resembling a Tamarind.
3. Country Plums under the following names. Besabis. Drap. Abooke. Machai, or Machanter. Magint. Malinta. Wanibé.

* Remedia Guineensia, page 61.

4. Bumelia.
5. Icaco, or Pigeon Plum.
6. Mantanka.
7. The Bread fruit.
8. The Cream fruit.

The following Exotic fruits which have been introduced into the Colony are now found there.

1. Plantains, Musa Sapientum, are much cultivated.
2. Bananas, Musa Paradisiaca, the same.
3. Cocoa Nuts, Cocos Nucifera, are still rare.
4. Papaws, Carica Papaya, are planted near the houses, and on the farms of the settlers.
5. Oranges, Citrus Aurantium, are cultivated in great quantities, and have now become wild.
6. Lemons, Citrus Acida, are rare.
7. Limes, Citrus Limonum, are abundant.
8. Cashew Nuts, Anacardium Occidentale, have been introduced to cultivation in considerable quantities since the time of Afzelius.
9. Rose Apples, Eugenia Jambos.
10. Tamarinds, Tamarindus Indica, the actual West India species, are grown, but not commonly.
11. Love Apples, Solanum Lycopersicum, are grown in many varieties.
12. Melons, Water Melons, Cucumbers, Squashes, Gourds, and Pumpkins, are all cultivated, and many varieties of

each are used. Among the Melons are some which, from having the smell of Musk, are peculiarly denominated Musk Melons.

13. Capsicums; two sorts are cultivated, and do not appear to be natives of the country.

LXXI. *Directions for the Management of the* Hot-house Fire-places, *that are constructed with Double Doors and Ash-pit Registers. By* William Atkinson, *Esq. F.H.S.*

Read April 6th, 1824.

When the fire is first lighted, the ash-pit door may be left open till the fuel be properly kindled, the door should then be shut close, leaving the brass register so far open as to allow sufficient air to blow the fire, but not more than is absolutely necessary to make it burn well, not violently, nor with a strong draught, for if more air be admitted than is required for a moderate brisk fire, it occasions a great waste of fuel, without increasing the heat.

The fire-place door must at all times be kept shut, and the sloping part of the iron frame of the door must be kept clear of coals, so as not to prevent the door from latching. No air must be let in at the door at any time, except when it cannot be avoided, in feeding the fire. Any cold air that may get in at the fire-place door is apt to rush over the fire into the flue without being heated, and that air tends to cool the flue, instead of heating it. Therefore all the air that is necessary for blowing the fire must be admitted at the ash-pit register, in order that it may get heated in passing through the fire to the flue.

It is impossible to determine the exact opening necessary to be left in the ash-pit register to admit sufficient air, as that greatly depends upon the goodness and length of the

flue, and the height of the chimney. When a flue is once properly heated, the draught becomes stronger, and then a less opening in the register is sufficient to supply the fire with air. In this state about half an inch opening in the register is generally sufficient, and it should be shut quite close, if it be found that the fire will burn with it in that position, as a considerable quantity of air will get in through the joints of the ash-pit door.

The best fuel for hot-house fire places is about equal quantities of coal and small cinders or braise. This is cheaper than using coals only, and keeps up a steadier fire with less smoke.

At all times when fresh fuel is added to the fire, the hot fuel unconsumed, must be pushed with an iron rake, towards the further end of the bars, and fresh fuel applied immediately in the front of it, so as to fill up the space between the bars and the inner part of the frame of the double door.

This fuel being dead between the bars and the door, protects the door from the heat of the fire, and prevents the iron from warping.

In supplying the fire with fresh fuel, great care must be taken not to throw it over to the further end of the fire, or into the throat of the flue, for this is often the cause of flues bursting. When coals are thrown beyond the fire, after it has burnt low, and the flue is hot, the heat of the brick-work distils gas out of the coals, this gas gets into the flue, and when the fuel over the fire becomes inflamed, if the flame be drawn into the flue, it ignites the gas that has been there generated, and causes an explosion; this ought to be particularly attended to, as an explosion of gas in

the flue may destroy a valuable collection of plants in a moment.

There is also another circumstance, which renders it desirable to attend to the manner of supplying the fire with fuel. If the fresh fuel be thrown over the whole surface of a hot fire, it produces an immense volume of smoke, and blacks. But on the contrary, when the fuel is added carefully at the front of the fire, in the manner before described, then much of the smoke given out by it is consumed in passing over the hot part of the fire.

Besides the management of the ash-pit register, the damper of the flue ought to be particularly attended to, by not opening it further than is absolutely necessary for the combustion of the fuel. The more the damper can be closed, provided the fire will burn moderately well, the more heat will be retained in the flue, without escaping up the chimney, and the less fuel will be consumed. And when the fire is made up for the last time in an evening, the damper should be put in as far as it can be, so as only to keep the fire just alive, and in general the fire may be allowed to burn bright against the last attendance in an evening, and then, instead of putting on fresh fuel, close the ash-pit and damper completely. This will prevent any draught of cold air through the flues carrying the heat out at the chimney, and the body of heat that is then in the mass of brickwork of the flues, having no other means of escape than into the house, will frequently be found sufficient for the night.

The ash-pit register should be properly attended to, and never suffered to get injured with rust; not even in the summer time, when not in use. The door should then be taken off

the hooks and properly cleaned, and rubbed with oil to prevent rust.

The shovel used for the fire-places should have a short handle, which is as convenient for use as a long one, and with a short handled shovel the fuel cannot be so easily thrown over the fire. The person who attends the fires should be directed to use his hands in opening and shutting the doors by their proper handles, and not be suffered to do it with a spade or shovel, for however strong they may be made, they may soon be destroyed by improper usage.

It is of the greatest importance to preserve the doors and ash-pits perfect; for if they be injured it is difficult to repair them without taking them out of the brick work, which is attended with considerable expense, and cannot be done when the fires are in constant use.

LXXII. *On* Forcing Grapes, *as practised in Denmark. In a Letter to the Secretary. By Mr.* Peter Lindegaard, *Gardener to His Majesty the* King of Denmark, *at the Palace at Rosenberg, Corresponding Member of the Horticultural Society.*

Read July 17th, 1823.

Sir,

The many different methods by which Vines have in late years been forced, have excited much attention among Horticulturists; and indeed it is not to be wondered at, for Grapes possess one essential quality superior to Peaches, viz. that of keeping. As soon as Peaches are ripe, they must be eaten, no means being yet known of preserving them when mature; consequently after October none of these fruits are seen on the table, except very late sorts, which are mostly without flavour. Grapes, on the contrary, when properly managed, may be kept almost the whole winter. The sorts eligible for this purpose, with which I am acquainted, are the White Chasselas, by the Dutch called Vroege (Early) van der Laan, and the Frankendal; when these are forced slowly, by means of horse-dung and tan, *without the assistance of fire,* they possess the property of keeping well for a considerable time. This depends, however, much on the season in which the Grapes have attained maturity; for example, when they are ripe in August, they will by no means keep so well as those which are ripened in the middle or latter end of September.

My best Grapes for winter use are those which are ripened in the Vine pits in which no fire is used, the forcing being conducted solely by means of dung placed within the pit and covered with tan: the Grapes thus treated ripen later, and the Frankendal is particularly preferred for the purpose; the Chasselas Grapes from the natural walls, when perfectly ripe, sometimes keep better than those which are forced.

I last year observed a peculiar property in the Frankendal Grapes in the vineries; they were paler than usual, which I chiefly attributed to the weather, for when the Grapes began to change colour, the weather was cloudy and rainy for near a fortnight, and when the berries have attained their proper size and maturity without much sun, they will for the most part remain pale. I have likewise observed that Grapes which are forced in large houses will seldom attain so dark a colour as those which are ripened in smaller houses, or in a frame where the fruit can be more affected by the sun's rays. In order to improve the colour of Grapes in large forcing-houses, and cause the sun's rays to produce more effect on them, I have for some years put boards under the trellis in the vineries, placing them at such a distance from the Vines that the Grapes might hang free. The result of this experiment, when first made, answered my expectation, the Grapes attained almost as fine a colour as those in the smaller houses, and the boards so placed under the Vines were besides very serviceable to the wood, assisting its ripening or maturity for the next season; but this system is only applicable to houses, solely appropriated to Vines, as it would deprive any other plants growing within the house, of sun and light.

There is a vinery in the Royal Garden at Rosenberg,

which was constructed by one of my predecessors, about forty-four years ago. The Vines, the White Chasselas, were planted outside the front wall, and then drawn through the wall into the house. These Vines used to succeed tolerably well, but always suffered on the outside by severe frost in the winter, part of the stems being a foot above the ground. The different methods which I had seen in Holland induced me to make an alteration in this vinery, when I succeeded to the management of the garden. I dug up and threw away all the Vines and cleared out the whole border three feet deep and ten feet wide, filling it up again with new mould of my usual composition for Vines, which was prepared in the preceding year.

My composition is as follows: one half the top spit from a common, rather sandy, a fourth part of rotten dung from the hot-beds, mixed with a little leaf mould and sprays only half rotten; a fourth part of rubbish from old buildings; these materials are well mixed together. A portion of farriers parings of the hoofs of horses, horns, and bones of animals and oyster shells are likewise gathered, pounded, or cut small, and mixed through the mass.

The above mentioned forcing-house is about eighty feet long by eight feet wide. One Frankendal Vine was planted in the centre, in front of the front wall, and was drawn through an aperture into the house and then trained on a trellis ten inches from the glass. On each side of the Frankendal were planted two White Chasselas Vines, to occupy the spaces, and as the Frankendal advanced, they were cut away. The Vine was planted in the year 1793. Ten feet from the front wall of the vinery is a Pine-pit running parallel

with it, both facing the south-east, or more properly speaking their meridian being eleven o'clock; I have in latter years observed the advantageous situation in which this Vine is placed; it derives assistance from the Pine-pit, as well as from the Vinery itself, the forcing of both commencing at one period, viz. about the middle of February. The root of the Vine being placed between two warm pits, the growth of it is much promoted. No fire is applied to either of them, for the Pines only remain in the pit in the summer months.

I shall now proceed to describe the management of the Vine in question; the two first years after the Vine was planted I put boards under the branches, so far as I thought they would extend that season. The shoots were carefully trained and fastened to the boards, and when the first four laterals had made their third joint, I then nipt them off above an eye: a fortnight after, the three or four next laterals were treated in the same manner, and the first which were nipped above an eye, were then entirely cut away about a quarter of an inch above the dormant eye of the main stems, and so I proceeded till the middle of August, when the shoots were stopped, leaving on the extremity three or four laterals for conducting the sap and nourishing the buds.

In the autumn, when the frost begins, I cover the whole border with old horse dung rather dry, about six inches thick, to protect the roots against the frost, and let it remain till the end of May or sometimes longer, according to the state of the weather. The dung during the winter being almost dissolved by rain and snow, conveys much nutriment to the roots of the vine; and though the winters are generally severe with us, I have never found the soil frozen

under the dung, which otherwise would retard the progress of the Vine in the early part of the spring. The lights are likewise put on in the autumn and remain till late in the spring, when I find that the frosty nights are over.

The third year a few grapes appeared, but they were cut away, and the Vine was treated in the same manner as before mentioned. In the fourth year forcing was commenced, though slowly, for that and the next year, and not before the beginning of March. The Frankendal Vine had now so far extended, that the Chasselas Vines on each side of it were necessarily cut away.

The lights, as I have observed, are usually put on in the autumn before the frost sets in, but in mild weather and thaw I admit air into the house. Any time in December, when a fine day happens, I remove the lights for pruning the Vine, which being done so long before the forcing commences, secures the Vine from bleeding. I need not say that selecting the finest and strongest branches, I leave not more than three or four under each light; and two are entirely cut down to supply bearing wood for the next year.

When the Vine is pruned, the lights are immediately put on, and, as before stated, in fine weather, much air is admitted; but when rain or snow happens, the house is shut up, and in severe frost is covered with shutters made of boards, which is the only covering ever used, even during the forcing.

The forcing last year, 1822, commenced the 19th of February when the pit within the house was filled to the top with fresh horse-dung, which remained in that state about eight

days, to sink; during that time much air was admitted to let out the steam, which arose from the dung; it afterwards was levelled, and tan worked over it about a foot thick; from that period, the house was shut up night and day, except in sunshine, the lights were slid down and the house regularly covered at night.

A very low temperature can only be obtained during the first eight or ten days, before the tan becomes warm, and the temperature is but little augmented before the buds begin to move or swell, which I perceived on the 12th of March; from that time I let the thermometer rise a little more, and when the buds were so advanced that the Grapes appeared, which was on the 29th of March, I let the thermometer in sunshine rise to 16 degrees of Reaumur (68 of Fahrenheit) though it was placed under a rafter in shade.

Before the Vines begin to bloom I always tie the shoots, and cut or break away unproductive and superfluous shoots, for I never touch the Vine when in bloom.

On the twelfth of May the Grapes began to bloom, and continued in flower about a fortnight. On the 21st of June they seemed to begin forming their seeds. In this period, viz. from seeding till the swelling began, I always gave much air that the seed might have sufficient time to be formed; and besides, at that time of the year, the sun can, although much air is admitted, raise the thermometer to 18 or sometimes 20 degrees of Reaumur (72 or 76 of Fahrenheit). On the 14th of July, some of the berries turned black, and by the beginning of September they were fully

ripe; but they were kept on the branches, at least so many of them as I intended to reserve for winter use, until the 20th of October, or even later.

When the Grapes are gathered I immediately remove the lights, that the Vine may be exposed to the free air. In December, when the thermometer in the open air sinks one or two degrees below the freezing point, the lights are put on the house again, and remain till the next autumn.

It may be said that this forcing is slow, but I apply the produce of this Vine particularly to winter use; and I have experienced, that when Grapes are slowly forced they possess more natural strength, and fitness for keeping.

This Vine occupies now a space of six hundred and forty square feet, and has been regularly forced every year with success since 1804, and the produce of it was last year four hundred and ten bunches (of which I have still a few fit for use); some of them weighed two pounds, and most of them one pound avoirdupois, but the Grapes were last year paler than usual, for they assumed their colour during rainy and cloudy weather, notwithstanding they kept as well as in any other season.

I do not advance this account as a matter of novelty; it is much practised in Holland, neither can I suppose that it can excite great attention in England, which possesses so many experienced and perhaps the first Horticulturists; but I have only proved that fine and well flavoured fruit may be produced without any assistance from fire. If any gentleman were disposed to try this method, I should advise him to adopt a forcing-house on a smaller scale, for

a long one admits more draft of air, than a smaller one, and the latter is easier kept warm; ten or twelve lights are sufficient space for one Vine.

I remain,

your very obedient servant,

PETER LINDEGAARD.

Copenhagen,
8th of April, 1823.

LXXIII. *On* Fig-trees, *and an* Account of their Cultivation *in a Fig-house, in the Garden of the late Earl of* Bridgewater, *at Ashridge in Hertfordshire. By* Joseph Sabine, *Esq., F. R. S. &c. Secretary.*

Read March 16, 1824.

The *management of the Fig-tree*, whether in houses or in the open air, in Great Britain, is, I conceive, less perfectly understood than that of any other of the fruits which are usually introduced into Gardens. In the *Transactions* of the Horticultural Society*, the details of the plans of several skilful cultivators have been already recorded; from the comparison of these, and of others yet to be communicated, the improvements in our practice will be derived, and we shall thus gradually proceed towards perfection, the attainment of which, either in this or any other branches of the gardener's art, I apprehend is yet very distant, notwithstanding the extraordinary advancement which has been made in it within these last few years, to which the exertions of the Horticultural Society, and the encouragement it has afforded, have mainly contributed.

My object in this Paper is to make known another instance of skilful practice in the cultivation of the Fig-tree under glass, which has been much spoken of, but not yet made

* See Horticultural Transactions, Vol. i. pages 252, &c. Appendix page 6, &c. Vol. ii. page 228. Vol. iii. page 307, &c. page 461. Vol. iv. page 185, &c. page 428, 504, &c. Vol. v. page 163, &c. page 346, &c.

public; the success of it I have had an opportunity of personally witnessing.

I am fully satisfied that many cases of failure in obtaining crops of well ripened Figs, have arisen from the want of knowledge of the kinds best adapted to the climate, and other circumstances in our gardens. Those which produce freely and abundantly fruits of good flavour and appearance, are, as in all other cases, the objects of cultivation; but Fig-trees with these properties are not known correctly by name, and still less so in description, so that at present, the only safe mode of acquiring plants in the first instance, is to obtain cuttings or layers from some garden in which a good sort is known to exist. The varieties of Fig-trees which are to be had by *name* in the nurseries, are many, but I believe that those which are really deserving of cultivation, are very few in number, perhaps less than those of any other of our established fruits. Those, however, which have the requisite merits, are sufficiently distinguished from each other, in their external character, and periods of maturity, to furnish such a supply to the table, as well in variety of appearance as at different seasons, as can be desired. All that is requisite is, that they should be so described and named, as that no difficulty shall occur in obtaining them when wanted.

Last summer, in walking round the gardens at Ashridge, I was particularly gratified by the appearance of the Fig-house, the dimensions of which I made notes of, and was supplied with the particulars of treatment by Mr. Thomas Torbron, the gardener, of whose ability and skill the *Transactions* of this Society already contain abundant evidence.

The house* is sixty-three feet long, six feet and a half wide, and twelve feet high, the trees having now covered the back wall to the very top, and appearing in want of more room it seems desirable that the height should have been originally extended to fifteen feet.

The upright front of the house is principally of glass, measuring six feet from the ground to the wall plate; it would have been better, perhaps, had this height been one foot less; such alteration, together with the advised extension of the back wall, would have given greater obliquity to the sloping glass, than it has at present. There are doors at each end. The walls are built on arches, and the trees are planted in the earth near the back wall of the house, against which they are trained on a trellis, which projects at the bottom, about a foot from the wall, and gradually approaches the top, the bars of which being about nine inches apart. There is only one flue, which enters at one extremity, passes along the front, and goes into the chimney at the other, dipping at the door ways at its entrance, and exit. The house is, however, almost too long for a single fire, so great a length of flue without a return in the furthermost part, must cause the end

* *Note by Mr.* Torbron. The wood and glass of this house were at first constructed for exotics, and erected at the Mansion House. They were afterwards moved to the Kitchen Garden, and placed against an old wall. Had the back wall been from fourteen to sixteen feet high, and the width of the house from twelve to fourteen feet, there would have been room for a row of Fig-trees along the middle of either, in large tubs, to remove elsewhere occasionly for greater or less heat, as the sorts might require, or at different stages of their growth; or planted in the ground, where they would have produced (I think) more plentifully than against a trellis, on which the pruning that is required causes them often to grow too luxuriant.

next the fire to be too warm, or the other extremity not warm enough. Three trees at equal distances from each other now occupy the whole extent of the back wall, and no other plant is cultivated within the house.* The trees are all of one kind, that which, Mr. TORBRON believes, is commonly called the Brown Ischia, but which, to avoid the risk of using a name erroneously, is for the present known in the Garden of the Society, under the name of the Ashridge Forcing Fig.

Mr. TORBRON states, that he usually shuts up the house, and begins the application of fires about the end of January. His treatment, as to temperature and admission of air, is similar to that which he has recommended,† and practises in forcing Cherries. The first crop of fruit begins to ripen early in June, and this lasts till the middle of August. The commencement of the second crop varies either according to treatment or the nature of the season, from the middle to the end of September, but it is always contrived to have it last till Christmas. Thus from this one house, there is a supply for the table of Figs during six entire months, and part of two others. During the summer season, Mr. TORBRON admits air in the day, when the solar heat rises to sixty-four degrees of FAHRENHEIT, and he keeps the temperature at night in the more early

* *Note by Mr.* TORBRON. In November, 1817, I found twelve trees planted against the trellis, which by their foliage seemed four different kinds; they had completely furnished the lower part of the wall, and for eight or ten feet upwards; some had even reached the top: but they bore little or no fruit; I immediately thinned them out to the three which now occupy the whole length. It had been intended to have erected another Fig-house adjoining to and eastward of the present one: but that has hitherto been found unnecessary, as the present one has yielded an ample supply of two crops every year.

† See Horticultural Transactions, Vol. iv. page 116.

period, from fifty to about fifty-four degrees, especially when the nights or mornings are frosty; but if they are mild, and the trees more advanced, it is allowed to attain to sixty degrees. The border is richly manured with dung, and kept tolerably moist with water.

In pruning, which is going on at all times, care is taken to lay in as many bearing branches as possible, to support the strong shoots, and when necessary, the old overgrown wood is taken out.

LXXIV. *Notices of Communications to the* Horticultural Society, *between May* 1*st*, 1821, *and January* 1, 1822, *of which Separate Accounts have not been published in the Transactions. Extracted from the Minute Books and Papers of the Society.*

Mr. Thomas Fleetwood of Dunnington, near Alcester, communicated to the Society on the 8th of May, the following *method of hastening the maturity of Grapes on open walls.* Before the Vines are out of flower, he brings each bunch into a perpendicular position by a thread attached to its extremity, and fastened to a nail in the wall, carefully confining the young branch with the bunch thereon, as close to the wall as possible. The period of blossoming is preferred for this operation, because the bunch at that time takes a proper position, without injury. By this practice, the bunches are kept so steady that the berries are not bruised by the action of the wind, and being fixed close to the wall, they receive such additional heat, that they ripen a month earlier than when left to hang in the usual way.

Thomas Paytherus, Esq. of Kensington Square, stated in a communication to the Secretary, dated the 9th of May, that he had succeeded in *destroying the insects* which infested the bark of the Apple and Cherry-trees in his garden, by rubbing the parts where they lodged, with the fresh green leaves of the common Fox-glove (Digitalis purpurea). The insects were

not only removed in the first instance by the operation, but did not again appear.

At the Meeting of the 15th of May, Mr. JOHN NAIRN, Gardener to THOMAS FORBES REYNOLDS, Esq. of Carshalton, exhibited a plant of Cactus triqueter, on which three other species of Cactus, viz. C. flagelliformis, C. speciosus, and C. speciosissimus, had been grafted. The appearance of these different plants thus united was singular, and the elevation of their weak branches on the strong upright stem of the plant into which they were worked, is advantageous in the display of their fine blossoms. Mr. NAIRN thus describes the operation of grafting, which may be performed any time between the months of March and September ;—" I take a small part of the plant I propose to engraft, and attach it by cutting away a slice of the fleshy part of the stock, taking off also from the piece to be attached, a small portion of the flesh, to secure its adhesion ; the sap is so glutinous that the piece will adhere without tying, but it is most adviseable to fasten it with bass, great care however, must be taken not to bruize it, for such an injury will cause it to rot. A union will soon be formed, and the graft will grow freely." Mr. NAIRN has observed that the pendant direction which the grafted Cactuses take, causes them to produce their blossoms not only more abundantly but earlier. He recommends a compost formed of five parts of rich garden loam and one part of bog mould, as best suited to their growth. They should be placed in pots in the green-house or conservatory, and be freely supplied with water during the summer,

but kept moderately dry in the winter. Cactus Pereskia answers equally well for an elevating stock as C. triqueter.

June 19th. Mr. William Gibson, Gardener to Henry Peters, Esq. at Betchworth Castle in Surrey, communicated a paper to the Meeting this day, descriptive of his *Method of growing Pine Apples under a Frame, with the heat of leaves alone.* He prepares his bed for his fruiting plants in February, with leaves collected in the autumn, chiefly of the common oak and Spanish Chestnut. The frame he uses is thirteen feet long by six feet and a half wide, three feet and a half high at the back, and two feet and a half high at the front. The basis of the bed is laid out eight feet wide, and this is gradually contracted to seven feet, when the bed has been raised to four feet and a half high. At this height the leaves are made level, and well trodden, after which a course of leaves ten inches thick, is laid round the edge of the bed, in order to raise the bottom of the frame, which, when placed, is by that means so elevated that a sufficient depth for large plants is secured within it. The Pine plants are then introduced within the frame, and are plunged into decayed leaves about three inches above the rims of the pots. The advantage resulting from this deep immersion of the pots is, that the plants soon throw out roots amongst the leaves, which promotes the growth of the fruit, and as they then require much less water than is usually given to Pine plants sunk in tan, the fruit has consequently a higher flavour. It is adviseable to make up a fresh bed in October for the plants which are to be kept through the winter, but if leaves

are not in abundance, a sufficient heat can be maintained in the old bed by the aid of linings to preserve the plants till the spring. The succession plants are kept by Mr. GIBSON in a similar bed of leaves, but the pots in which they are placed are sunk in tan, though not so as to cover their rims, because it is desirable not to let the roots of these plants extend beyond the pots.

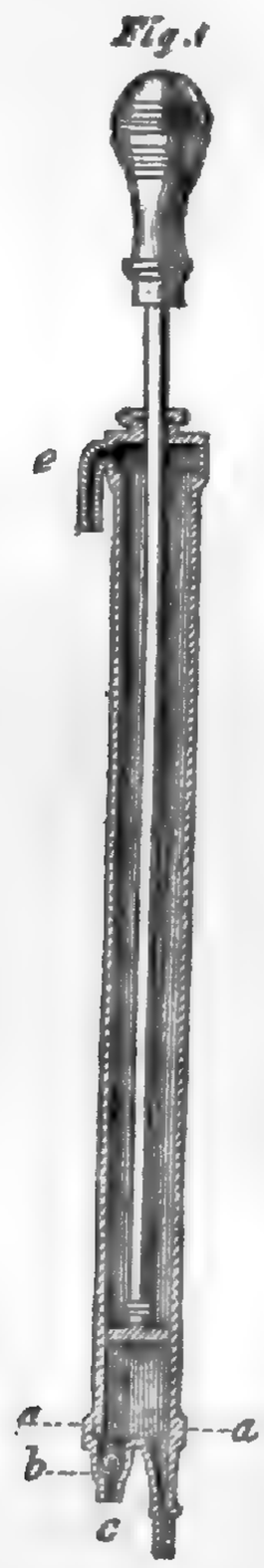
JOSEPH BROOKHOUSE, Esq. of Warwick, communicated in a letter to the Secretary, dated July 30th, his *method of cultivating Cucumbers in a Peach-house.* In this house the Peach-trees are trained to the back wall only, the lights being placed in the usual sloping direction used for fruit houses. In the front a dung pit is formed, seven feet broad and three feet deep, extending the whole length of the house; one side is formed by the front-wall and the other by a brick-in-bed wall on the inside of the house, the surface of the bed being level with the front wall plate, which supports the sloping rafters and lights. The bed is formed in the usual way with dung, and covered with mould. At first the plants are protected by hand glasses, which give the advantage of double glass, and makes them strong; when they are long enough to train, they are attached to a wire trellis which is placed about ten inches from the glass.

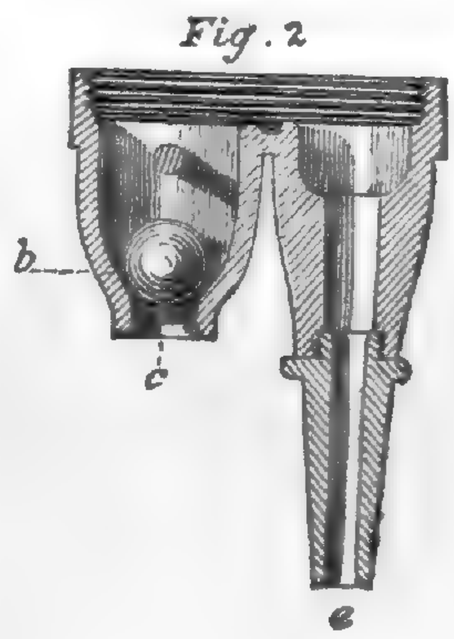
The plants are suffered to run without stopping the leader, as is usually done, and when the side shoots break, they are almost certain to shew fruit, these are immediately stopped at the fruiting joint; but if any of them do not shew fruit at the first joint, they are cut entirely away; by this means nothing but productive or fruit bearing runners are left upon

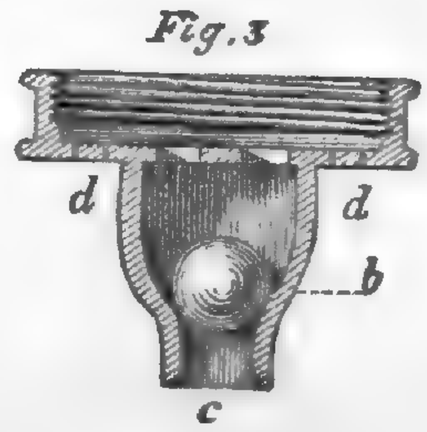
the plants, for these side shoots will almost invariably produce fruit again if stopped at a fruiting joint, and barren shoots if stopped at a barren joint. When the fruit-bearing shoot is stopped where it shews fruit, Mr. Brookhouse always leaves a leaf at the base of the fruit, and when the fruit is cut he takes off the leaf with it. By this method he keeps the plant free from unnecessary leaves, and admits sun and air to the fruit. If the plants run too long, and interfere with the Peach-trees, he unties them, strips off the lower leaves and side shoots, to within four feet of the end shoot, and lays the bare part of the stem down upon the bed, covering a part of it with the mould, at the same time stopping the main runner at a fruiting joint, and training about four feet in length up the trellis work. In consequence the runners are so lowered as not to interfere with the Peach-trees, and they break afresh, yielding fruit plentifully till September or October. All the fruits which are produced, hang pendant from the wires, and thus preserve their beauty and regularity of shape, and also are equally green all round, which is very essential to their good appearance. The bed on which the Cucumbers are grown is renewed every year, but is never lined.

Mr. John Read of Yalding, Kent, exhibited at the Meeting on the 7th of August, 1821, a *Garden Syringe* upon a new construction; for which he had obtained a patent. Mr. Read, in a communication to the Secretary, read at the same Meeting, observed that in charging the common Syringe, the water having to pass through the same small holes by which it is to be discharged, the weight of the lift is very considerable, and the time required to charge it unnecessarily long;

another evil belonging to it is, that after a few strokes of the piston, the air confined above it forces out the water at the upper end upon the hand of the operator. In Mr. READ's Syringe these defects are remedied. The whole is made of brass, the tube being very accurately drawn. Two caps are made to fit the top of the tube. One is shewn at Fig. 1, *a. a.* screwed on to the tube and more enlarged at Fig. 2. The other is represented at Fig. 3. In the socket attached







to this last cap, is a ball acting as a valve *b.* which rises the moment the lift is made, and allows the water to rush in freely at the aperture *c.* The full lift having been thus easily and quickly made, the moment the piston begins to descend the ball closes the aperture *c.* and the water is driven out in a

dispersed shower more or less fine according to the fineness of the perforations in the cap at *d. d.* When it is necessary to use the syringe to throw a full and unbroken stream, the other cap is used, see Fig. 2. In this the valve is driven in at *c*, as in the other caps, and is discharged with much force through the pipe. To avoid the inconvenience arising from the water rushing upon the hand at the upper end of the syringe, Mr. READ has placed a small bent pipe at the shoulder of the tube, Fig 1, *e*, by which the confined air or any water which may rise above the piston, can escape without annoying the operator.

Mr. THOMAS AYRES of Duffield, near Derby, communicated to the meeting, on the 27th of August, 1821, *a description of a remarkably large Gooseberry plant*, growing at Duffield, and of two others in the garden at Overton Hall. That at Duffield is in the garden of Mr. WILLIAM BATES, a market gardener; it is planted on the east side of a steep hill, the substratum of the soil being a hard grit stone. It is ascertained to have been planted at least forty-six years; the branches extend to twelve yards in circumference, and have produced several pecks of fruit annually for these last thirty years. It is usually manured with soap suds and the drainings from the dung hill. The two others in the garden at Overton Hall, near Chesterfield, the seat of the late Sir JOSEPH BANKS, are both nearly of the same size. The younger plant is trained to a building, the north and west sides of which it has entirely covered; it was planted thirty years ago. It measures fifty-three feet four inches from one extremity to the other, and yields on an average,

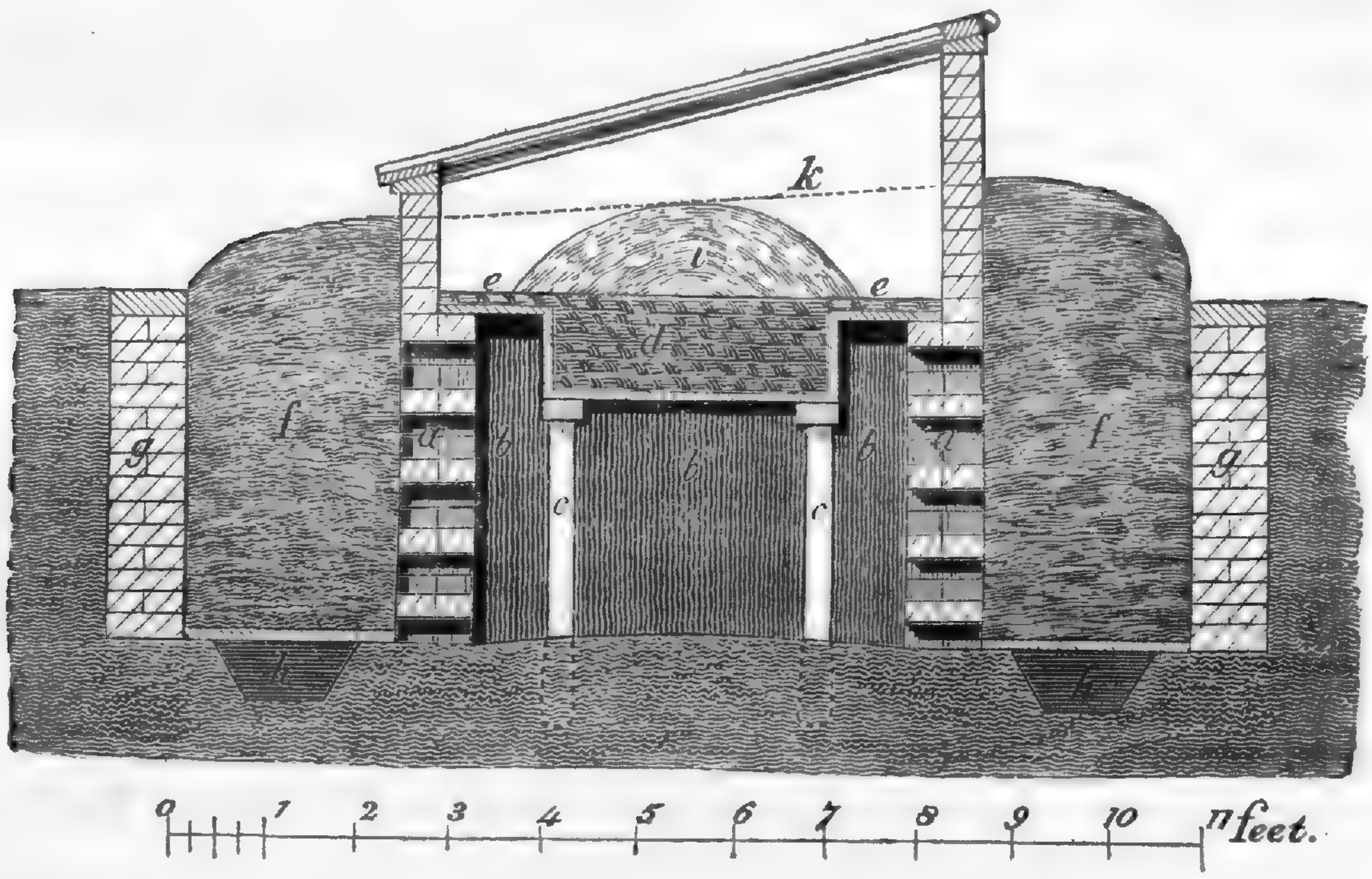
from four to five pecks of fruit annually. The other, whose age is not ascertained, is planted against a north wall; it extends fifty-four feet, and is now beginning to decay. The soil in which these grow is a brown or hazel coloured light loam. Mr. Ayres was not able to ascertain the name of the variety in the garden at Duffield, those at Overton are said to be the Champagne.

Charles Scrace Dickens, Esq. F. H. S. communicated to the meeting on the 8th of November, a plan which he had adopted for constructing *a hot-bed for forcing Cucumbers.* Instead of forming a solid bed of dung, as is usually done, he constructs four brick piers, one foot and a half high and nine inches square, to support a two-light frame. Two pieces of timber, four inches square, are laid from pier to pier at back and front; on these is laid a platform of boards an inch and and a half thick; these are plastered with neat's dung, which when dry, is covered two inches thick with good mould, and the frame is placed on the piers. Under the centre of each light a bushel of mould is laid, forming a hillock. After this the lights are put on, and linings of hot dung applied all round, the interior space remaining hollow. In two days, the bed is fit for use; if the heat is found to decrease, a wheelbarrow full of fresh dung is added and shaken up with the linings, and well watered. In order to confine the heat the whole of the linings are plastered with neats' dung, by which means a temperature is obtained of from 75 to 80 degrees. A bed which was thus made on the 3rd of February, produced on the 30th of March two fine cucumbers measuring thirteen inches in length.

Mr. John Anderson, Gardener to the Earl of Essex at Cassiobury, communicated in a letter to the Secretary, dated the 5th of November, his *method of growing Early Celery*. He forms in the ground a trench six feet wide and one foot deep; into this he puts six inches of rotten dung mixed with a little road grit, and mixes the compost well with the soil by digging it together; the Celery is then planted in cross rows six inches apart, and eighteen inches from row to row; as the plants advance they are earthed across the trench. By this means a much larger quantity of Celery can be grown in the same space of ground than in the usual way; but the method is only applicable to Early Celery, for late crops so grown would be liable to rot and perish.

M. Pronville of Versailles, in a letter to the Secretary, received on the 17th of December, communicated some observations respecting the *grafting of Roses as standards*, on the Wild Rose or Eglantine of the French, which is practised very much in the French nurseries. Mr. Pronville has observed that some of the most beautiful varieties lost their improved colours and returned to their primitive state, if kept on their own roots. He instances the *Felicité*, a beautiful variety of the Rosa Damascena of Lindley, which only retains its white variegation when grafted. The Clementine of Decemet, a variety of R. rubiginosa, and the R. sulphurea minor, are under the same circumstances, so that other advantages, besides placing the flowers at an agreeable height from the ground, results from this practice, which is now also becoming common in England.

Mr. John Mearns, gardener to William Hanbury, Esq. at Shobden Court, near Leominster, communicated to the Meeting on the 18th of December, a description of a *Pit for growing Early Cucumbers,* which was erected by him some time since, and which, from experience, he has found to possess considerable advantages. The annexed section will explain the principle upon which it was constructed.



a. a. are the walls of the pit in open brick work; *b. b. b.* the cavity under the bed into which the steam from the dung linings is admitted; *c. c.* are posts of iron or stone supporting a bed or trough, *d.* made of slate, stone, or tiles, extending the whole length of the pit; *e. e.* are slabs of stone, slate, tiles, or oak, closing the top of the cavity; the slabs in both these cases are so closed or luted together, that no rank steam may escape through them, but the heat from the cavity is admitted more freely in the early part of the season, to heat the internal air in the frame, because the slabs at *e. e.*

are covered at that time with about two or three inches of light mould only; *f.f.* are dung linings; *g.g.* walls to keep up the earth all round the pit; *h. h.* drains to keep the dung dry; *i.* shews a hill prepared for receiving the plants, and the line *k.* marks the height of the earth when the bed is completely moulded up for the season. A pit on this plan may be constructed much cheaper than on M'Phail's, and the temperature in it will be found to be more equal. The expense may be materially reduced by omitting the walls *g.g.* in which case the earth must be cut in a slanting direction from the pit, making the trench wider at the top than the bottom, which will have a beneficial effect in always keeping the dung close packed against the wall of the pit.

LXXV. *Description of a* Vinery, and Mode of Training practised in it. *In a Letter to the Secretary. By Mr.* William Beattie, *Gardener to the Earl of* Mansfield, *F.H.S., at Scone, near Perth. Corresponding Member of the Horticultural Society.*

Read October 7th, 1823.

Sir,

I take the liberty to send you an account of what is considered an improvement in the *training of Vines in Vineries,* which I have practised with success in those under my care at Scone, during the last two years; that you may lay it before the Horticultural Society.

The plan is simple and easy, and the advantages arising from it very considerable, as will be evident to those any way conversant in Horticulture, from the following statement. But before entering into the details, it may be necessary first to give an account of the houses.

They were designed and built by William Atkinson, Esq. in the year 1807, upon a plan, which I then considered as new, never having seen any of the kind before, though I had resided and practised as a gardener in England, more than twenty years previous to my coming to this place. They are each heated by two fires, being fifty feet long, eight and a half feet wide inside, and fourteen and a half high, with a front wall two feet in height, wherein are ventilators two feet by one foot each, moved from the inside by means of an*

* In a house built under my direction in this neighbourhood, the ventilators were opened by the handle being fastened on an iron rod with a joint in the

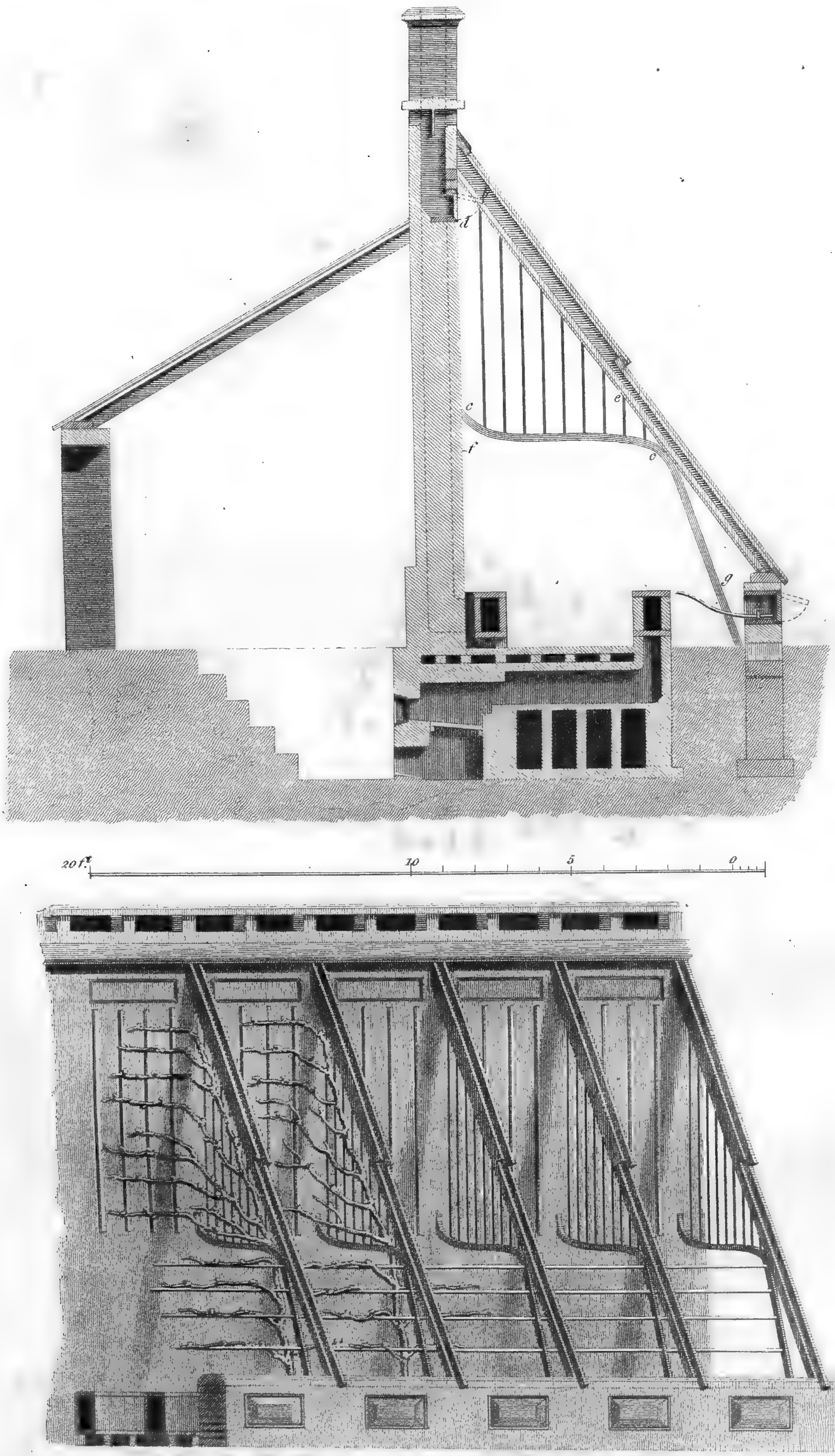
iron handle (marked *a* on the section of the annexed plan); there are also ventilators at the top, under each sash or light, three feet by nine inches, which are moved by pullies at *b*. and *d*. In consequence of this mode of ventilation, the sashes are not required to be moveable, as in most houses, but are made fast, and never taken off. To the above plan of ventilating there may be some who will object, on account of the glasses being permanently fixed, and not moveable during the winter season, in order to ripen* the wood, as it is termed; from this, however, I have found no inconvenience, as I have never failed to have most excellent crops, although the glasses have not been taken off since the houses were erected. The front wall is built on arches, so that the roots of the Vines, which are planted within the house, near the front, have access to the front border.

By the dimensions before stated, you will perceive that the house is likewise very narrow, compared with most other Vineries; the intention in this was to have as small a body of cold air to warm as possible, consistent with a given extent of surface, whereon to train the Vines. To enlarge this surface to the utmost, I have erected a trellis under each rafter (as

middle of it, which turns and fastens on some upright pegs. I like the plan much, but it is expensive.

* Not having a greenhouse at Scone, I have for the seven years kept the Vineries full of plants all winter, or course excluding the frost; I was told I should spoil my Vines by so doing, but this has not been the case; for they have borne most excellent crops, and I am now so satisfied by the results, that if the lights were moveable I should not take them off in winter. So much damage is done to the flues when they are exposed to frost, that the prevention of the cost of the repair of them is an additional cause for retaining the glass on the house the whole year.

The Vinery at Scone.



T. Tredgold Delin.t

W. Lowry Sculp.

represented at *c*, in the section), then from these trellises the Vines are trained along the back-wall, between *d* and *f* horizontally, on a perpendicular trellis; those on the front are also trained horizontally, between *c*, and *g*, and the young shoots are not permitted to go higher than *e*, so that from *e* to *b* is left entirely open for the free admission of sun and light to the trellis and back wall.* By comparing the extent to train on, with a house of much larger dimensions, say, for example, one of fifty feet in length, fourteen feet in width, twelve feet in height, with a front wall of five feet (two feet and a half of which is generally glass), it will be seen that there is very little less extent for training on, in these houses, than in one of the above dimensions, when the plants are trained in the common way. In the former there are eight hundred and eighteen superficial feet, and in the latter eight hundred and fifty, while the cubical contents of air to be heated in the first, is three thousand five hundred and six feet, and in the other five thousand nine hundred and fifty feet, making a difference of no less than two thousand four hundred and forty-four cubical feet, in favour of the narrow house, while the difference in the extent for training on is only thirty-two superficial feet. From this it is very evident that less fuel

* The mode of training is further illustrated by a drawing of the interior of the house, which is annexed to the section. The Vines not being originally intended for a house of this description (having been trained up under the glass in the common way) I was under the necessity of using the wood produced for that purpose, but I prefer having the branches horizontal, and always get plenty for a supply from the shoots arising from near the bottom; I always stop those that produce the fruit at a joint or two above the bunch, and select a shoot near the bending (where they are in general strong) for my next year's supply, laying it in a little longer.

will be required to keep the narrow house to the same temperature as the other. I shall state it at one-third, although I might with safety say one half only is required, as I now have had houses of both descriptions under my management. The saving effected in the article of coal in a part of the country, where it is scarce, and of course expensive, is of vast importance to the owner; besides, the glass, from having the sashes fixed, requires so little repair, that it has not cost five shillings in sixteen years in the whole range of hot-houses, consisting of three hundred feet. The lights from their elvevation are not so liable to be injured by hail storms as in the generality of houses, and from the mode by which they are ventilated, it will be found that the wasps, which are so very destructive, never get in to destroy or injure the fruit, as they too often do in those houses where the sashes are pulled down to give air. Besides the advantages which I have already mentioned, a house of this description will be found very convenient and economical for small families, since the Grapes, from their situation, will be partially retarded on the same Vine, those on the back wall coming in first, those on the trellis next, and those on the front last, thereby affording a regular succession. The house, however, may be used for training Vines in the common way, if such should be preferred.

I remain, Sir,

your very obedient servant,

WILLIAM BEATTIE.

Scone Gardens,
18*th September*, 1823.

LXXVI. *Descriptian of* a Pine-House and Pits. *In a Letter to the Secretary. By* Charles Holford, *Esq. F.H.S.*

Read June 17th, 1823.

My dear Sir,

I beg leave to present to the Society two models of buildings, which I can, with confidence, recommend as being well adapted to the cultivation of the Pine Apple. The one is of a fruiting house heated by steam, or by a common flue, when the steam apparatus is not in use. It is glazed with crown glass, and the laps puttied. As the frames move on rollers, all the plants are easily accessible, either from the front or the passage at the back. The tan pit being near the glass, the internal space to be warmed is small, in comparison with the dimensions of the house, fifty feet long by thirteen wide. It is therefore heated to any degree of temperature with a very moderate fire, and never requiries matting, or any other protection. The ventilation is very perfect by means of the top sashes, and eight moveable shutters, three feet long by six inches wide, placed at regular intervals in the upper part of the back wall.

The other model is of two pits for the cultivation of crowns, suckers, and succession plants, without fire heat. They are built in brick work, on M'Phail's plan, with pigeon holes, and possess advantages over any other which I have seen, in the following particulars,—being parallel with each other, the dung which is placed between them is suffi-

cient to heat both, in the early part of the winter; when a stronger heat is required, a lining is added to the outside of each pit, and the whole covered with boarded shutters, which prevent the escape of heat, and at the same time protect the linings from wet or cold. I found in the coldest nights of the last very severe winter, that a regular temperature of sixty to sixty-five degrees, or higher, if required, could be constantly maintained. If Pits on this construction are used for early forcing, the ventilation can be effected without admitting any cold air, by means of a copper, iron, or leaden pipe, three or four inches diameter, placed obliquely along the front, and connected with short vertical pipes of smaller diameter opening into the pits. The lower end of the large pipe communicates with the open air, by means of a funnel, and the whole being heated by the dung lining, a constant current of fresh warm air is admitted whenever the aperture at the end of the funnel is left open.

The space in which the plants are plunged may be filled with tan, leaves, or well fermented dung. It is essential that the pits should be sunk in the ground, the better to confine the heat and protect them from cold winds, care being taken that the bottom is well drained.

I remain, dear Sir,

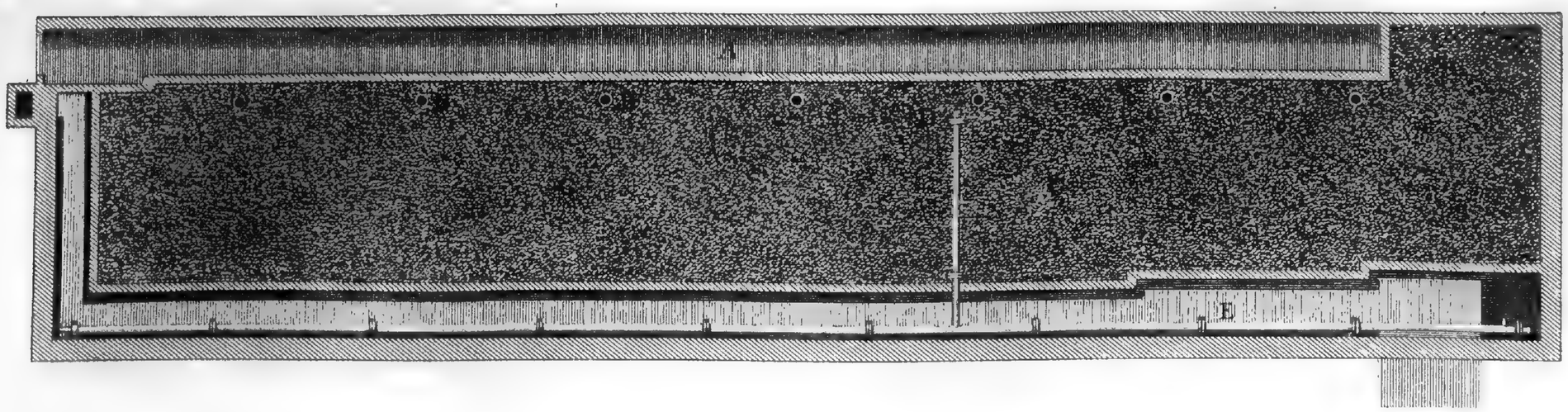
with great esteem, truly yours,

Charles Holford.

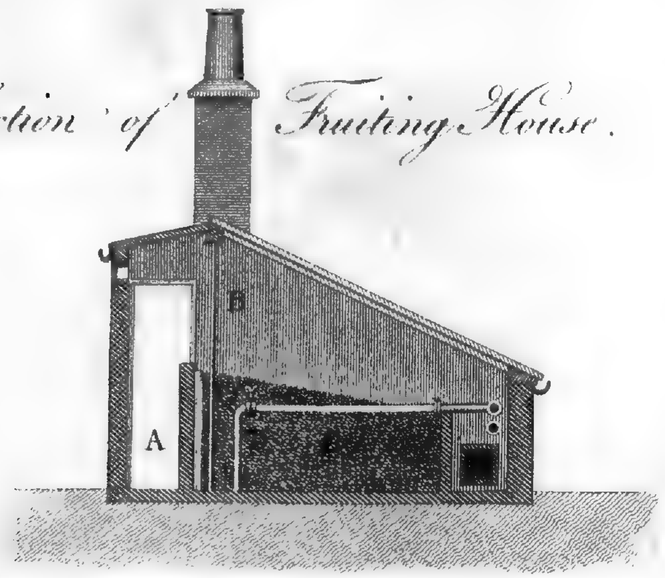
Hampstead,
17*th June*, 1823.

Mr. Holford's Pine House & Pits.

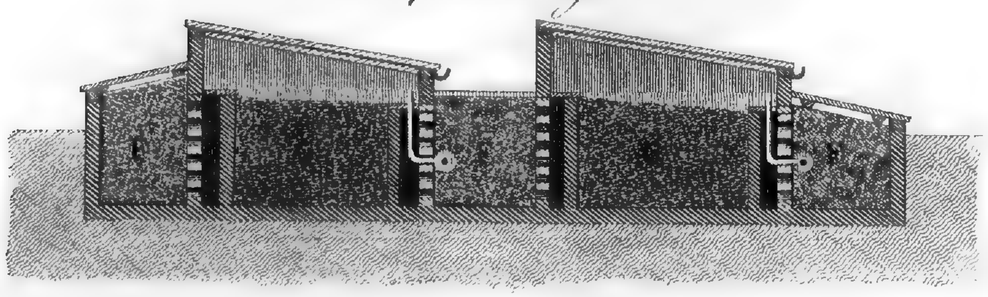
Plan of Fruiting House.



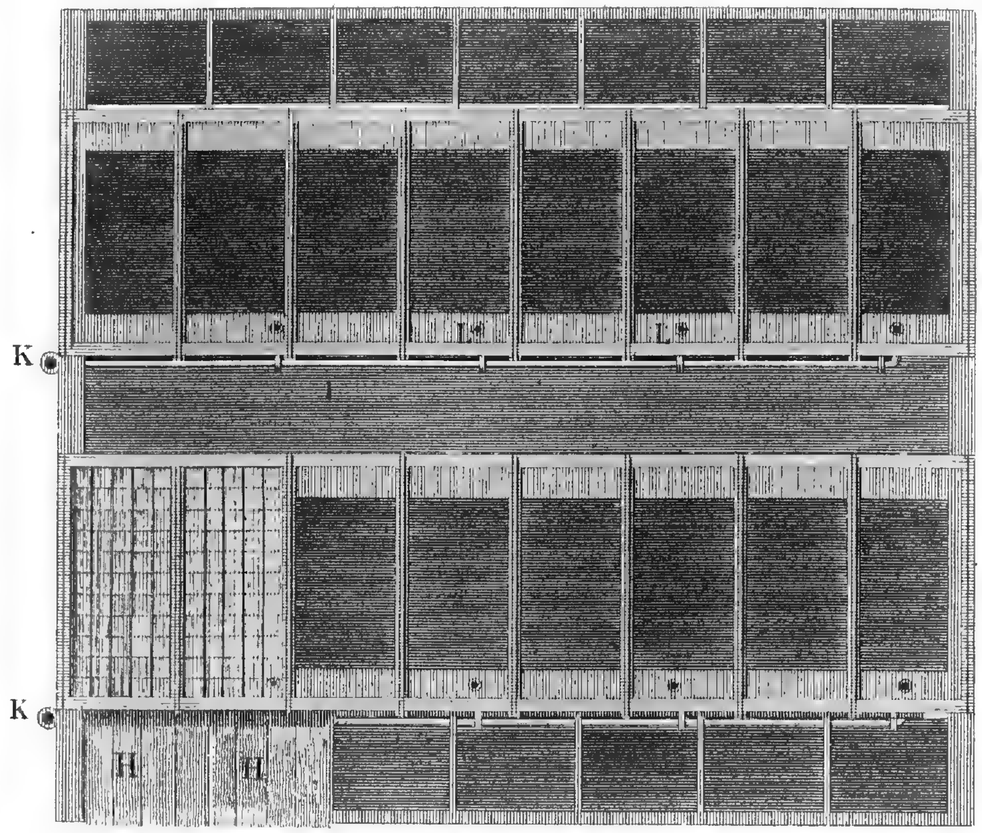
Section of Fruiting House.



Section of Succession Pits.



Plan of Succession Pit.



0 5 10 20 30 40 feet

T. Tredgold Del.

Engraved by W. Lowry.

Note by the Secretary.

The annexed engraving, which contains the ground plans and sections of the house and pit, has been taken from the models presented to the Society by Mr. Holford.

Reference to the Plate.

Fruiting House.

A. Passage along the back.

B B. Iron columns supporting the rafters.

C C. Tan pit.

D. Steam cock to turn the steam on or off from a main pipe, communicating with other houses.

E. Brick flue for heating the house when the steam apparatus is not in use.

Succession Pits.

F F F. Linings of hot dung or leaves.

G G. Tan in which the plants are plunged.

H H. Moveable shutters for confining the heat of the linings, and protecting them from wet or cold.

I. Metal pipe of three or four inches diameter, placed obliquely against the open brick work, the lowest end being at the bottom of the pit and communicating with the air funnel, the other rising to near the top of the lining at the opposite end.

K K. Tunnel communicating with the open air.

L L. Ends of the small vertical pipes through which the warm air passes into the pits.

LXXVII. *Description of an Apparatus for* Ventilating Hot-houses. *In a Letter to the Secretary. By Mr.* George Mugliston *of Repton, near Derby.*

Read April 6th, 1824.

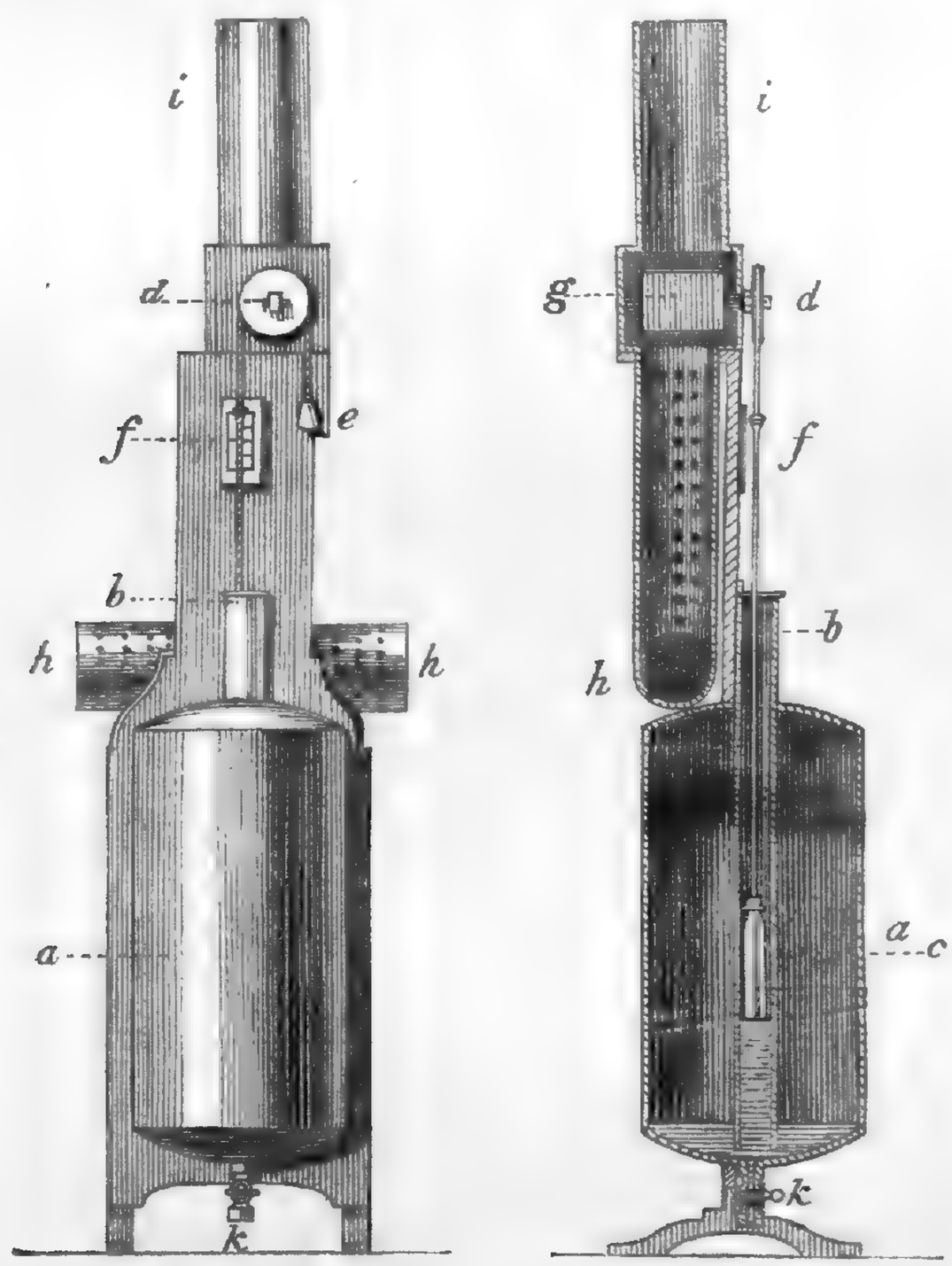
Sir,

Having practised Horticulture for nearly thirty years, in which time I have paid particular attention to the treatment of the Vine under glass, and having frequently experienced the mischievous effects of excessive heat during the night, more especially in early forcing, when the fires are often made proportionate to the expectation of sudden and severe frosts, it occurred to me that a self-regulating ventilator would prove a most valuable addition to the forcing-house.

From some experiments which I have made upon the expansion of heated air, I found that a machine constructed on the plan shewn in the annexed sketch, would fully answer the object I had in view, and if attended to with moderate care, would keep the temperature of the house at all times so equal, that no serious injury could ever be sustained.

The cylinder, or air vessel (*a*) is made of thin copper, tinned in the inside, and coated on the outside with flatted varnish or black paint, to assist in the absorption of the heat of the surrounding atmosphere. The tube (*b*) is also of thin copper, descending nearly to the bottom of the cylinder, into which water is poured, varying in quantity according to the size of the machine. (*c*) Is a corked phial or other float, suspended by a cord passing over a wheel (*d*), at the end of

which is a balance weight (*e*). An index (*f*), shews the elevation and depression of the float. When the temperature of the house is increased, the air in the cylinder will immediately expand, and pressing upon the water in the bottom, will elevate that which is in the tube, and with it, of course, the float will be elevated. The movement of the wheel (*d*), whose axis runs through the valve (*g*) immediately opens the valve in proportion to the extent of the revolution. The heated air which collects in the perforated air tube (*h*) is thus suffered to escape.



The length and shape of these tubes may be varied according to circumstances; if the communication with the external air is to be made at the top of the house, it will be necessary to put a conical cap on the top of the air tube (*i*), acting upon

a spindle, so as to turn with the changes of the wind, and if the communication is to be made through the end of the house, a transverse tube will be necessary. A drain cock (*k*) is inserted in the bottom of the cylinder, in order that the water may be drawn out, and replaced if air should get in by the machine being shook.

I am satisfied, from the precision with which this machine acts, that it is not only perfectly competent to obviate all the difficulties at present experienced in hot-houses, from sudden increase of temperature, but that in hospitals and other buildings requiring ventilation, it may be applied with great advantage.

I am, Sir,

your very obedient servant,

GEORGE MUGLISTON.

Repton, near Derby,
March 24th, 1824.

Semi double, Quilled Orange Chrysanthemum.

Small Yellow Chrysanthemum.

Engraved on Steel by

Semi-double Quilled Pink Chrysanthemum.

Quilled Salmon-coloured Chrysanthemum.

Engraved on Steel by W.

LXXVIII. *On the* Protection of the Blossoms of Wall Trees. *By* Thomas Andrew Knight, *Esq. F. R. S. &c. President.*

Read June 15, 1824.

In a climate so subject to sudden variation of temperature, as that of Britain, in which a frosty night is often preceded by a wet evening, and succeeded by a bright and warm morning, the blossoms of almost every species of fruit tree trained to a wall, usually set best under the protection of some degree of covering. This seems to operate beneficially in several different ways. It often prevents the blossoms being wetted, and thence renders them less subject to injury from any moderate degree of cold. It diminishes the radiation of heat from the wall during clear and cold nights; and it prevents the sudden transition from a low to a high temperature in warm and bright mornings: and the sudden transition from low to high temperature is much more fatal to vegetable, as it is to animal life, than an equally sudden and equally violent transition from a high to a low temperature. Even the blossoms of standard Fruit trees, which are situated in their interior parts, when such trees have been properly pruned, receive much protection from the external branches, and not unfrequently escape destruction from frost, when all those, which grow upon more exposed branches, perish. Amongst the various of methods of protecting the blossoms of Wall trees from frost, which are adopted by gardeners, it must be admitted that the most efficient are

those by which the trees are thickly covered during the night, and fully exposed during the day; and if this kind of protection be given to Peach and Nectarine trees very early in the spring, it not only preserves the blossoms, but it also prevents the appearance of blistered leaves, which are generally abundant in cold and unfavourable seasons. This diseased state of the leaf is often confounded with that which is occasioned by the bite of the Aphis; but it is in its origin wholly different from that, and arises solely from the leaf having, whilst very small and young, been injured by frost. The trouble and expense of so frequently applying and removing the covering of Wall trees, and the destruction of their blossoms, which almost necessarily occurs, compel the greater number of gardeners to apply only such kinds of covering, as, when once applied, may remain unmoved, till the danger from frost is nearly past. Amongst these, woollen nets, or a patent imitation of netting, which may be obtained at a much lower price, constitute the best material: but it is expedient that the meshes should be sufficiently wide to permit the ingress of bees; for the pistils of the blossoms of almost all Fruit trees are not in the best state to receive the pollen, till the anthers of the same blossoms have become expended, and the number of blossoms, which are rendered productive of fruit by their own proper pollen, is not, I have reason to believe, very great. The exclusion of honey-gathering insects is consequently in most cases very injurious.

The material which I employ, and which I proceed to recommend, is every where obtainable, and at an extremely small expense. It consists of small branches, about two feet in length, of the Birch tree, collected as soon as the leaves

have become full grown in the end of June. These are preserved under cover till the following spring; when they have become (what I consider a very important circumstance) perfectly dry. They are then secured to the walls by a few nails and shreds, with their points hanging perpendicularly downwards, their upper and thick ends being in contact with the wall, and the opposite slender extremities projecting eight or ten inches from it. This position of the covering material appears to me to be an extremely advantageous one, and whether it be or whether it be not so, I have constantly employed it in this manner during more than ten years; and in every year a very large portion of my blossoms have escaped injury under its protection. Even in the present season, one of the most unfavorable I have ever known, my Apricot trees bear a good crop, and the blossom of my Peach and Nectarine trees, though it was feeble, owing to the wetness of the last summer, and existed generally in small quantities only, has set well, in some cases in useless abundance.

The discretion of the gardener must direct him relatively to the quantity of the material to be used with advantage. If the situation of his garden be low, he may cover his trees more closely than if it be high, but the covering should never be so thick, or close, as to prevent a large portion of the blossom being visible to a person passing within a few feet of the wall: and under such circumstances almost every blossom will in some parts of the day receive a portion of the solar rays. As the danger to be apprehended from frost diminishes, and the quantity of young shoots and foliage increases, the covering material should, at successive periods, and in small quantities at a time, be taken away. My ex-

perience has been confined to the use of the slender branches of the Birch tree, but branches of other trees with small leaves, such as the Hawthorn or Hornbeam, might, I believe, be employed with success; though I give a decisive preference to those of the Birch tree.

LXXIX. *On the Cultivation of* Asparagus *during the Winter. By Mr.* Peter Lindegaard, *Gardener to his Majesty the King of* Denmark, *at the Royal Gardens of Rosenburgh, Corresponding Member of the Horticultural Society.*

Read May 4, 1824.

Much diversity of opinion prevails amongst gardeners on the continent relative to the *Cultivation of Asparagus.*

Though much on this subject by experienced gardeners is treated of, in the *Transactions of the Horticultural Society,* I nevertheless venture to offer some instructions on the same subject, but particularly on *Forcing Asparagus in the winter,* by means of horse-dung in beds in the open air, without frames or lights, which method I have practised more than thirty years. I shall first proceed to describe my mode of forming new plantations, which is that generally practised in Denmark.

I prepare every year a piece of ground for four or six beds, in the most eligible situations, destroying at the same time an equal number of old and exhausted beds. The soil I prepare for the purpose is a light loam rather sandy; this is trenched in the autumn, about four feet deep; in the bottom of the first trench is thrown a layer of old decayed horse-dung, about six inches thick, upon this a layer of earth taken from the next trench, and so proceeding alternately with an equal layer of earth and dung, till the whole is finished. In trenching the ground, the earth is thrown up in high ridges,

being thus more exposed to the atmosphere during the winter.

In the following spring, when the frost is quite out of the ground, and the soil is fit for working, the whole is trenched and well worked through with a fork; being thus well mixed together, it is then levelled, and divided into beds. I allow four feet for a bed, and two feet for the alleys, two rows of Asparagus on each bed, and the plants two feet apart. In each end of the beds are driven two pegs to indicate the margins when the alleys are subsequently to be digged up.

I always use one year old plants, which, indeed, is the usual practice with us, and is preferable to sowing seed in the bed to remain, by which a whole year is lost. The holes for receiving the plants must be at least eight inches in diameter, and four inches deep, formed into a hill in the centre, whereon the plants are laid; after all their roots and fibres are spread out in the holes, they are immediately covered with good rich mould, full four inches above the crown. Some gardeners will not admit any other vegetable to grow on their Asparagus beds, I have however the first year taken a small crop from the beds, either a row of early Radishes or Lettuces, or drilled a row of Onions of the large Spanish kind, just in the middle of the beds where it only occupies a space four inches broad, which I have not found to do the least injury, for the roots of such vegetables do not extend deep in the ground. The second and subsequent years no vegetables whatever ought to be sown or planted on the beds. In the autumn, when the tops are cut off (one inch under the surface of the ground) the beds are to be stirred up with a fork very carefully. A line is then

drawn from peg to peg for digging up the alleys, about six inches deep, and the earth from them is thrown upon the beds. The alleys must afterwards be again filled to the top with old rotten dung, which will be fit to lay in the beds again the succeeding autumn. This practice must be repeated every autumn, in order to heighten the bed, that the shoots may have their proper length when they are to be gathered.

Asparagus being thus managed, and kept clean from weeds, will be fit for gathering in the fourth season, but should be sparingly cut in that year. Some gardeners begin gathering in the third season, but this weakens the plants. Some of our market gardeners cut their Asparagus twice a day, for they are not so well esteemed when the tops or heads are become green.*

Every one who has visited Holland, and paid the least attention to Horticulture, knows that the soil in the environs of Haarlam, and the greatest part of North Holland, is pure sand, but Asparagus succeeds there extremely well; dung is however not spared by the Dutch, who treat Asparagus in the same manner as we do, and I have observed that their Asparagus, as well as every other vegetable, is particularly tender and palatable; whether this excellence is derived from

* Mr. BAUMANN has suggested cylindrical pots or pipes, eighteen inches high, and one inch in diameter, to put over the shoots; but I think these would be turned over by high winds, and would, besides, in extensive plantations, be attended with much trouble and expense. See *Horticultural Transactions*, Vol. v. p. 334. The Dutch are likewise fond of white Asparagus, and they cut them also early in the morning. I have even seen, in some places, those shoots which appear in the middle of the day, earthed up to preserve them white till the next morning. I have followed this mode with some of my best beds.

the soil, or the moist and nutritious sea-air, I am not able to decide.

I shall now proceed to describe my method of forcing Asparagus. For this purpose I select the best beds which are left uncut in the preceding summer. The period at which I have to deliver my chief crop is always fixed; it is the King's birth-day, which happens on the 28th of January. Forcing is consequently commenced four or five weeks before that date. A great deal of fresh horse dung having been collected before hand, the beds which are destined to be forced, are usually four, measuring about forty feet in length each. It is necessary to remark, that when severe frost is likely to occur, before forcing is commenced, the beds must be covered with a layer of litter or leaves, to keep out the frost. The beds are at first stirred up loosely with a fork, and the surface spit of the alleys is thrown on them to heighten them, for the crowns are sometimes so near the surface, that it is otherwise impossible to get the shoots of a proper length. The alleys are then cleared out to the depth of about three feet and a half, and hot dung immediately put into the cavities, and raised up as high as a foot and a half, above the level of the top of the beds, after being trod a little and made level, it is covered with some old boards or planks, which keep in the heat more regularly, and are also useful for treading upon when the Asparagus is to be gathered. In the middle of each bed is placed a narrow board, on which a man, when gathering, may place one foot, whilst his other foot goes close along the lining. When the alleys are filled up with the fresh horse dung, the beds must be covered with litter, or with some of the same dung, about three or

four inches thick, more or less, according to the state of the weather.

Both ends of the beds must likewise be provided with a lining of fresh dung as deep in the ground as the alleys. The whole being thus ready, nothing more is to be done, but from time to time to observe the temperature of the beds. I usually put some sticks into them, by which the encreasing heat may be observed. In a fortnight after the whole is finished, a few shoots will make their appearance, the first gathering will then take place; a man, who walks on the top of the linings, throws the dung or litter from the half bed upon the other side, so far, that the man who gathers can put one foot on the narrow board in the centre, and the other on the lining. Two men come immediately after on the other side, to remove the litter from the opposite side, and a man follows to gather; the litter must, as soon as possible, be spread on the beds again. The beds will afford but few shoots till they become warm. It will be necessary every third day to examine the temperature of the beds, that the shoots may not grow too long; when the beds are not over-forced, they will continue to produce Asparagus for five or six weeks.

When gathering has ceased, or rather on the approach of spring, it will be advantageous to the roots of the Asparagus to remove the dung from the alleys, and fill up the cavity with good rich mould, for the new roots which the plants emit in the summer, cannot extend themselves in the dung which was employed for forcing, which will be bound together in a compact mass. The dung must likewise be taken off, from the beds, and they are then to be raked over; there will still appear some shoots in the spring, which are to be left for the support of the roots during the summer.

The quantity of Asparagus which may be expected from four beds of the above mentioned size, depends much on the state and age of the plants. I had, for instance, last year, 1822, on his Majesty's birth-day, January 28th, two thousand seven hundred fine Asparagus, which the British Minister, The Right Hon. Augustus Foster, witnessed on the day they were collected,* and the beds for a fortnight after that yielded some fine Asparagus. I thus calculate the whole produce at four thousand, exclusive of small ones.

I am induced to believe that in a country where this vegetable is in demand, the cost of this mode of cultivation would be amply repaid, and particularly in a season when other vegetables are scarce. It is true, the requisite quantity of dung will cause much expense, but after it has been used for that purpose, it is not lost. After the beds have yielded their crop, I collect all the dung which was laid on them, and a good layer from the top of the alley, this I mix with fresh dung, from the hot-beds, and find it very useful in the spring, when dung is much in demand. Asparagus plants thus forced, are in some measure injured, but by no means destroyed, three seasons being necessary for their restoration, after which they may be forced again successfully. When Asparagus is intended to be forced later, as, for instance, in the beginning of February, less dung is wanted, as the alleys require it to be only to half their depth, and less covering on the beds is required, for nature assists art at that season.

Our market gardeners who force Asparagus for sale, apply half sea weed (Fucus vesiculosus) and half horse dung, which,

* The Asparagus when gathered from time to time, must be put in dry sand, in a cellar or green-house, not laid flat, but always upright in regular rows, where they will keep fresh and good, for a fortnight or three weeks.

when the season is a little advanced, does very well. Gardeners who live near the sea-coast, where horse dung is scarce, apply sea-weed alone for hot-beds, small Peach house linings, &c. it attains a high temperature, but does not retain it long; it is well adapted for late crops on hot-beds.

I will offer a few observations on Dr. FORBES's account* of the mode of raising Asparagus at Vienna.

His method of preparing the soil for Asparagus is the usual mode pursued in this country, except that the layer beneath in the trenches, consisting of "dung, horn chips, wood chips, bones of cattle, ox horn, and decayed branches of shrubs or trees" is not used. The latter vegetable materials, I consider very good, but I doubt whether the animal substances can be useful to so succulent a plant as Asparagus, which rapidly draws up its nutriment from the soil without extracting it gradually, as in the case of the Vine: there, the nutriment, whatever it may consist of, is divided and retained in the vessels long before it reaches the fruit. It is also a question with me whether such animal matter may not have some influence on the taste of Asparagus. It is a well known fact, that vegetables which grow beneath the soil, such as Carrots, Potatoes, &c. are more or less palatable relatively to the circumstances of the soil in which they are produced.

I also object to the plan of sowing the seed a foot below the surface. I believe every experienced gardener will agree with me that this depth is too great.

* See page 335 of this Volume.

LXXX. *The Method of* rearing Seed, *in the East Indies, of the Carrot, Turnip, and Radish, to prevent the Deterioration of those Vegetables. By* William Ingledew, *Esq.*

Read April 2, 1822.

The difficulty of preventing vegetables, particularly the European kinds, from becoming deteriorated in India, is well known to all gardeners who have had experience in that climate; seeds are consequently imported every year from England, and these, from various causes, often disappoint the Horticulturist, being either decayed or dead on their arrival.

From this circumstance, I was induced to pay particular attention to a method of rearing the seeds of some vegetables, which I first saw practised in the neighbourhood of Seringapatam, in the year 1806; from that year to 1818, I was much occupied in gardening, and therefore had ample opportunities of witnessing its efficacy, and if the practice of eleven years can authorize me to speak with confidence of its results, I need not hesitate to declare my belief, that vegetables on which this operation can be performed may be always preserved in their genuine and perfect state and quality.

The Indian gardeners in the Deckan confine the process I am about to describe to three different sorts of vegetables, the Carrot, the Radish, and the Turnip, these being in more constant demand among the native inhabitants than any other

species grown in England: the following is the mode they adopt.

They first prepare a compost with equal proportions of buffalo's and swine's dung, as fresh as can be procured, and of red maiden earth; these are mixed well together into a smooth paste, with a sufficient quantity of water to make the whole of the consistence of tar; to a quantity of this mixture, equal to about five quarts, three drams by weight of assafœtida, dissolved in a small quantity of water, are added. This compost is always used soon after it is prepared.

The vegetables for this operation are drawn, when wanted, from the beds, when they have attained about one third of their natural growth, and those plants are chosen which are the most succulent and luxuriant; the tops are removed, leaving a few inches from their origin in the crown upwards; and a little of the inferior extremity, or tap root, is cut straight off likewise, allowing nearly the whole of the edible part to remain, from the bottom of which, to within about an inch of the crown, are made two incisions across each other entirely through the body of the vegetable, dividing it into quarters nearly to the upper end. They are then dipped into the compost until they be well covered by it, both externally and internally, and are immediately placed in beds, previously prepared for their reception, at the distance of fifteen or sixteen inches from each other, and so deep in the ground that the upper extremities only appear in sight. They are afterwards regularly watered, and when they take root, and fresh tops have made some advance in growth, they require but little attention. The tops speedily become large, and grow into strong and luxuriant stalks, the

blossoms acquire a size larger than ordinary, and the seed they produce is likewise large and vigorous, and superabundant in quantity.

Innumerable roots are thrown out from the incised edges of these plants, they consequently receive a greater abundance of nourishment, which occasions their luxuriant growth, causes them to yield not only a more than an ordinary crop of seed, but also of a superior quality.

The gardeners in the Mysore country, where I resided, consider the early part of January to be the most advisable time for putting these plants into the ground; the seed of the Turnips will there be collected at the end of the third, and that of Carrots at the conclusion of the fourth month afterwards. The weather throughout this period is generally dry in that part of India, the steady dry heat which usually prevails there in March and April, matures and perfects the seed, which is formed previously to the appearance of such winged insects as infest and often impair the blossoms. If planted at other times of the year, when the weather is dubious, the effects of the compost are apt to be weakened or destroyed, and should heavy falls of rain happen soon afterwards, many of the plants will probably be destroyed, but if the weather be clear and favourable they will, with a very few exceptions, survive and flourish.

The Indian gardeners consider red earth to be preferable to any other kind, in the preparation of the above composition, and that of the White Ant hill, which is, I believe, invariably red, to be still superior. They believe the latter to be of a finer quality, and to have undergone some beneficial alteration in the formation of the hill by the labour of these

insects. They are of opinion that the other materials of the compost are equally requisite, being of a more heating nature than other manures; and that the assafœtida is beneficial in this respect, and gives additional force to the preparation.

It is not known how or in what manner this process originated, or how long it has been in use at Seringapatam, where it has been employed from time immemorial; it is called the Hydrabad practice, which would induce the belief that it may have been introduced from that city; but whether it be of Hindoo or Mahomedan origin cannot now, perhaps, be credibly ascertained. I should be inclined to favour the latter opinion.

In the years 1812 and 1813, I tried several experiments to ascertain the supposed superior power of buffalo's dung in the above compost; three separate trials were made at intervals within this period, with two composts exactly similar, except that one contained its proportion of buffalo's, the other a like quantity of cow-dung; the vegetables to which the former was applied germinated somewhat more speedily, and for a time had a more rapid growth, and some of these plants blossomed earlier than the others, but the size and strength of the full grown plants, the size of the blossoms and seed, and the quantity of the latter, appeared to be similar in every respect, and the vegetables which this seed afterwards afforded, were of equal quality.

Crops of vegetable seeds produced by the above process, will not always be of similar worth; the seed collected from plants that have not, during the early period of their increase, and when in blossom, been exposed to heavy or long con-

tinued rains; but, on the contrary, have experienced a steady heat, and mild weather, will invariably be superior to any other that may not have had these advantages. By this method I was enabled to produce Carrots and Turnips of a superior quality, and uniformly of good flavour, for many years in India, without the introduction of foreign seed, which otherwise would have rendered frequent supplies of the latter necessary. Most vegetables deteriorate very rapidly in that climate, but none more so than the two sorts above mentioned.

I entertain no doubt of the superior merits of this method in rearing the seed of some vegetables in hot climates, but it is difficult to assert that the compost employed by the Indian gardeners is the best and most suitable that can be devised, or whether the several ingredients with which it is prepared by them, be particularly beneficial, or really necessary to success. It will however, I think, be admitted that a portion of some manure, if not required for nutrition, may be useful as a stimulus, and also to soften the earth combined with it, and to render it easily pervious to the young and delicate roots that are about to be formed. A mixture of earth and water merely, will on drying become hard, and instead of receiving with facility, may offer such resistance to the roots as may be detrimental to the plants.

It may likewise be of some consequence to select such earth for the compost as may contain much life and vigour, and if this supposition can be admitted, earth that has not, for a time, been cultivated, will probably possess some superiority over such as has been partially exhausted by feeding

plants. On this ground, the preference of the Indian gardener to the earth of the White Ant hill, may deserve to be not entirely disregarded.

The nests of White Ants, in the South of India, are generally, if not always, found in red soil, and at the depth of two or three feet beneath the surface of the ground. It is habitual with these insects to raise a perpendicular and conical mound of the earth immediately surrounding their habitations, to the height of four, five, or six feet, according to the degree of moisture the ground contains (for they cannot carry earth without moisture); they work this earth to an extraordinary degree of fineness, and deposit it in layers, until the work is completed.

It is probable that vegetables would die after undergoing the severe operation above described, if they were to be placed in the ground without any coating; but being well and closely covered, both externally and internally, with a substance that is probably congenial and nutritious to them, they are preserved from decay, and from the effects of bleeding at their wounded surfaces, and whenever roots are thrown out they come in immediate contact with nourishment for their future support. It would appear to be requisite therefore, that a covering of some sort should be employed, and that, whatever it may be, it should possess the quality of supplying food readily to the tender roots on their first appearance to preserve the plants alive, and which a garden bed prepared in the ordinary way, the soil not pulverized, nor closely adhering to them, could not furnish so speedily.

The influence of the assafœtida employed by the Indian gardeners is probably over-rated by them, but it may perhaps

be of service in repelling destructive insects for a time, until the delicate roots acquire sufficient size and strength to resist their attacks.

As I never knew Beet-root to furnish seed in India, I subjected some of these plants, and some others likewise of the Parsnep, to this operation, but they failed of success.

LXXXI. *Description of an* Elruge Nectarine Tree, *in the Garden at West Dean House, Sussex. In a Letter to the Secretary. By Mr.* John Bowers, *Gardener to Lord* Selsey, *F. R. S.*

Read July 6th, 1824.

Sir,

By the desire of Lord Selsey I send you some fruit from the large *Elruge Nectarine* tree, growing in a fruiting house at West Dean Gardens, for the inspection of the Members of the Horticultural Society, and I take this opportunity to send you the following particulars of this fine tree.

It is trained to a wooden trellis fixed to the rafters under the glass roof, at one foot distance from the glass; the length of the trellis is twenty-nine feet, and the width twenty-two, or six hundred and thirty-eight square feet, which is completely filled with fine bearing wood; the shoots are of a great length, with remarkably fine foliage. The tree is very regular in every part, and free from any gross or luxuriant wood.

The house is built with upright sashes, two feet three inches to the top of the plate, and the back wall on which the rafters are placed is twelve feet high. The tree is planted within, about the centre of the front of the house, eight inches distant from the lower front plate, and the front wall is built upon arches, to admit room for the roots to extend into the border. The circumference of the trunk, at four inches from the border, is thirty-two inches, it divides itself into two large limbs at the height of nineteen inches

from the ground, one of them is eighteen and a half inches in circumference, and the other is nineteen. From these two large limbs proceed the different branches which occupy the above trellis. As far as I can learn, the tree was planted a maiden plant about the year **1793**, with two other trees, one at each end of the house, which were consequently removed to make room for the one now remaining. It has for these last eleven years produced, upon an average, about sixty dozen of fine fruit every season.

Sir,

I am your most obedient

humble servant,

JOHN BOWERS.

West Dean House, near Chichester,
July 3d, 1824.

LXXXII. *A Classification of* Peaches *and* Nectarines. *By Mr.* George Lindley, *Corresponding Member of the Horticultural Society.*

Read January 6, 1824.

In offering to the notice of the Horticultural Society this Paper on the *Classification of Peaches and Nectarines,* I presume I need make no apology. The confusion of the sorts, the misapplication of their names, and the perplexity thus occasioned, both to the nurseryman and gardener, are sufficient inducements to attempt such an arrangement as may remove these inconveniences. I am aware that this has been already done to a certain extent; but, the characters employed for the purpose have, I conceive, been insufficient, as will appear on a comparison of the different arrangements now to be examined. In doing this there is no great difficulty, since the authors to be considered are but few.

Miller* and Duhamel† are the first, who have given us any thing like systematic descriptions, and they have gone no further than to distinguish, generally, sawed from crenate or smooth leaves, large from small flowers, and to separate the Peaches with downy skins from the Nectarines with smooth skins, and those whose flesh adheres to the stone from those

* Gardener's Dictionary, Eighth Edition, sub art. Persica.

† Traité des Arbres Fruitiers, par Duhamel, Vol. ii. page 1, &c.

whose flesh separates from the stone. Had there been no augmentation of the number of varieties of these fruits since the time when those authors wrote, their distinctions would probably have been sufficient, but the great influx of new kinds demands a more systematic and extended division.

Mr. Robertson * has gone much further into this subject than either Miller or Duhamel, and has favoured us with the first synoptical distribution of Peaches and Nectarines which I have met with. It is simple and perfectly clear, as far as it goes; but it is defective in general application; for if he had attempted by it to make an arrangement of all the different sorts, he would have found the eight subdivisions of his table insufficient. Mr. Robertson's two classes, founded on the leaves, are correct only so far as regards the first, or those plants whose leaves are without glands. The second, comprehending the glandular leaved kinds, required to be extended to a third, for it includes plants with two distinct natural characters dependent on the glands. His divisions into those with large and those with small sized flowers are also objectionable, since our collections furnish several varieties of Peaches and Nectarines which possess a middle character. The designating the large blossoms as light coloured, and the small ones as deep coloured, cannot be admitted as proper distinctions; several of the small flowers being quite as pale as the large ones. The character of Mr. Robertson's subdivisions, founded on the adhesion of the flesh to, or the parting from, the stone, are perfectly natural.

* See Horticultural Transactions, Vol. iii. page 380.

The Editor of the *Bon Jardinier*, and the Count Lelieur in his *Pomone Française*, have given a classification on a much more comprehensive scale, introducing a third division of flowers; and they take notice, also, for the first time, I believe, of two different characters in the glandular leaves. Their method of arrangement, however, appears objectionable in forming their classes from the fruit instead of the leaves, because an attempt at a thorough classification on this principle must be ineffectual till the fruit has arrived at maturity. In forming a synoptical table for practical purposes, we should follow the progress of nature herself, as nearly as possible; we ought not to make an arrangement that is not progressive, or to which we cannot apply ourselves as the parts successively come into existence. The fruit not being the first produced, we ought not to begin with it, in preference to the leaves.

Having stated thus much, I must render a just tribute of acknowledgement to the writers above mentioned, for having brought into notice the division of the glandular leaves, which are highly important, and sure marks of distinction between varieties which might otherwise be considered alike.

The anxiety which at present prevails to cultivate the Peach in its full extent, the disappointment which cultivators daily experience in finding one sort of fruit imposed on them for another, to say nothing of the error of continuing to propagate a fruit by a name wholly at variance with acknowledged authority, have induced me to attempt such an arrangement of Peaches and Nectarines as will, to a certain extent, give a facility of discrimination in distinguishing one sort from another.

For this purpose, I have formed a synopsis on so extended a scale as to admit not only all those which are at present well known, but such also as are likely to become known, or to be introduced hereafter. For this purpose I create *three classes,* each of which has *three divisions;* these are each separated into *two subdivisions*, and every subdivision into *two sections,* making in the whole thirty-six sections. Part only of these sections are applicable to those varieties we are now acquainted with, the others will remain to be filled up as new kinds arise, there being at present no plants with such characters.

The practice which has lately prevailed, and which I hope will be continued, of obtaining new varieties by cross impregnation; the glandless with the glandular, the large-flowered with the small-flowered, Peaches with Nectarines, and the clingstones with the melting kinds, is the method by which the completion of the arrangement, as well as the extension of good sorts, is most likely to be accomplished.

The fruits which I have now arranged under the different sections are those, both French and English, which have been described by different authors; some others are added, which are well known in England, but which have not been noticed in any work of celebrity.

In the following Tables, the *classes* are founded on the leaves, and the *divisions* on the flowers.

Class I.

Contains those whose leaves are deeply and doubly serrated, having no glands. Fig. 1.

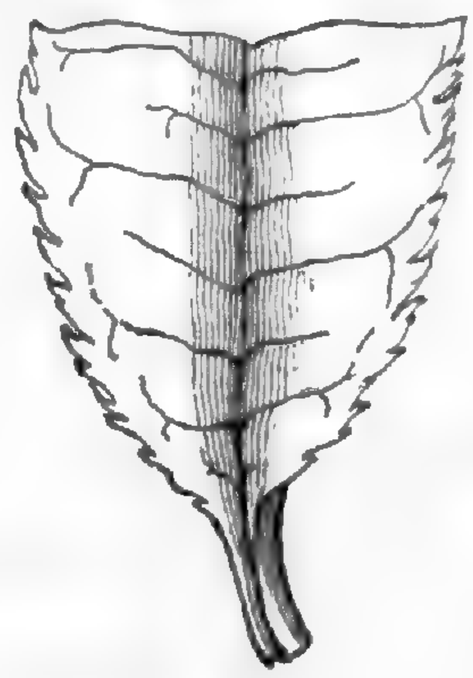


Fig. 1.

Class II.

Those whose leaves are crenate or serrulate, having globose glands. Fig. 2.

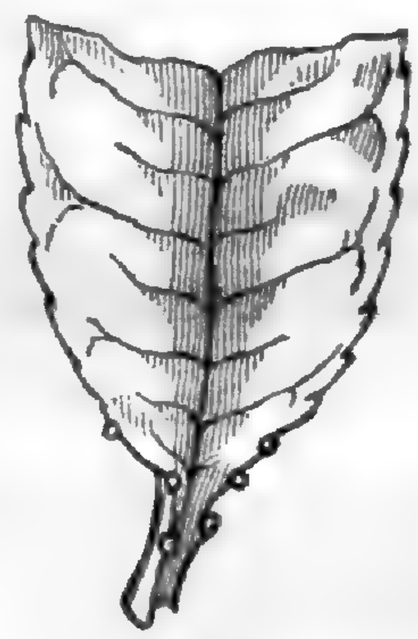


Fig. 2.

Class III.

Those whose leaves are crenate or serrulate, having reniform glands. Fig. 3.

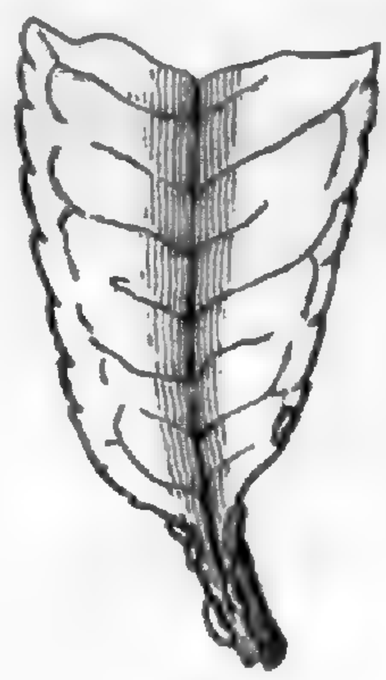


Fig. 3.

An accurate observer will distinguish other characters in the glands; they are either sessile or pedicellate, but these distinctions are too minute for application on the present occasion.

The form of the glands, as well as their position, is perfectly distinct; they are fully developed in the month of May, and they continue to the last, permanent in their character, and not affected by cultivation. The globose glands are situated, one, two, or more on the footstalks, and one, two, or more on the tips or points of the serratures of the leaves. The reniform glands grow also on the footstalk of the leaves, but those on the leaves are placed within the serratures, connecting, as it were, the upper and lower teeth of the serratures together. Their leaves, when taken from a branch of a vigorous growth, have more numerous glands than the leaves of the globose varieties. It will however sometimes happen, that glands are not discernible on some of the leaves, especially on those produced from weak branches; in this case other branches must be sought for which do produce them.

With regard to the flowers, on which the divisions are founded, all authors previous to Duhamel have described large and small flowers only. Both in the *Bon Jardinier* and in the *Pomone Française*, "fleurs moyennes," or middle-sized flowers, are mentioned; the notice of them, however, originated with Duhamel, who, in the descriptions of several of his Peaches, speaks in a manner which indicates even four sizes, viz. *fleurs grandes*,* *fleurs assez grandes*,† *fleurs petites*,‡ *fleurs très petites*,§ and on examining the

* Madeline blanche. † Avant Pêche blanche. ‡ Bourdine. § Bellegarde, and others.

trees thus described, the differences are evident. In noticing these, however, it is not intended to convey an idea that a fourth division is necessary; on the contrary, it would perplex rather than elucidate. In fact, it requires some practice to distinguish the middle sized from the small flowers.

We now come to the fruit, with regard to which, nature has furnished two distinct characters in the external appearance, as well as two in the internal structure. The first of these depends on the downiness or smoothness of the skin, the former being true Peaches, the latter our Nectarines, known in France only as *Pêches lisses*, or smooth skinned Peaches. Each of these are divisible, from their internal structure, into the Pavies or Clingstones, and the melting kinds; the former having firm flesh adhering so closely to the stone as to be perfectly inseparable from it: the latter having soft dissolving flesh separating readily from the stone, and leaving a few detached pieces of the flesh only behind. As the mature fruit in vegetable economy appears to be the last stage of nature in her progress towards reproduction, I have adopted it as the most natural on which to found my subdivisions and sections.

Accordingly the *classes* of Peaches and Nectarines may by examination of the leaves be ascertained in the first year the plant has been raised; the *divisions* from the flowers in the spring following, and the *subdivisions* and *sections*, founding the former on the character of the skins, the latter on the qualities of the flesh, from the fruit in the succeeding summer or autumn; and whether the number submitted to examination be great or small, the arrangement may be effected with equal facility and precision.

A Synoptical Table *of* Peaches *and* Nectarines.

- **Class I.** Leaves deeply and doubly serrated, having no glands.
  - *Division* 1. Large flowers.
    - *Subdivision* 1. Peaches.
      - *Section* 1. Clingstones.
      - *Section* 2. Melters.
    - *Subdivision* 2. Nectarines.
      - *Section* 1. Clingstones.
      - *Section* 2. Melters.
  - *Division* 2. Middle flowers.
    - *Subdivision* 1. Peaches.
      - *Section* 1. Clingstones.
      - *Section* 2. Melters.
    - *Subdivision* 2. Nectarines.
      - *Section* 1. Clingstones.
      - *Section* 2. Melters.
  - *Division* 3. Small flowers.
    - *Subdivision* 1. Peaches.
      - *Section* 1. Clingstones.
      - *Section* 2. Melters.
    - *Subdivision* 2. Nectarines.
      - *Section* 1. Clingstones.
      - *Section* 2. Melters.

A Synoptical Table of Peaches and Nectarines.

- **Class II.** Leaves crenated or serrulated, with globose glands.
  - *Division* 1. Large flowers.
    - *Subdivision* 1. Peaches.
      - *Section* 1. Clingstones.
      - *Section* 2. Melters.
    - *Subdivision* 2. Nectarines.
      - *Section* 1. Clingstones.
      - *Section* 2. Melters.
  - *Division* 2. Middle flowers.
    - *Subdivision* 1. Peaches.
      - *Section* 1. Clingstones.
      - *Section* 2. Melters.
    - *Subdivision* 2. Nectarines.
      - *Section* 1. Clingstones.
      - *Section* 2. Melters.
  - *Division* 3. Small flowers.
    - *Subdivision* 1. Peaches.
      - *Section* 1. Clingstones.
      - *Section* 2. Melters.
    - *Subdivision* 2. Nectarines.
      - *Section* 1. Clingstones.
      - *Section* 2. Melters.

A Synoptical Table of Peaches and Nectarines.

- **Class. III.** Leaves crenated or serrulated, with reniform glands.
  - *Division* 1. Large flowers.
    - *Subdivision* 1. Peaches.
      - *Section* 1. Clingstones.
      - *Section* 2. Melters.
    - *Subdivision* 2. Nectarines.
      - *Section* 1. Clingstones.
      - *Section* 2. Melters.
  - *Division* 2. Middle flowers.
    - *Subdivision* 1. Peaches.
      - *Section* 1. Clingstones.
      - *Section* 2. Melters.
    - *Subdivision* 2. Nectarines.
      - *Section* 1. Clingstones.
      - *Section* 2. Melters.
  - *Division* 3. Small flowers.
    - *Subdivision* 1. Peaches.
      - *Section* 1. Clingstones.
      - *Section* 2. Melters.
    - *Subdivision* 2. Nectarines.
      - *Section* 1. Clingstones.
      - *Section* 2. Melters.

The names given to some of the English Peaches and Nectarines are so directly at variance with the classification of Duhamel,* which, as far as it goes, is unobjectionable, that I cannot avoid observing on them, lest it should be supposed, that I acquiesce in so incorrect a nomenclature. The classes of Duhamel are four. The *first* are called *Pêches*, being those with downy skins, the flesh separating from the stone. The *second* are called *Pavies*, being those with downy skins, the flesh adhering to the stone. The *third* are called *Pêches violettes*, being those with smooth skins, the flesh separating from the stone. The *fourth* are called *Brugnons*, being those with smooth skins, the flesh adhering to the stone. The two last classes include those fruits which we call Nectarines. The names therefore which the English gardeners have applied, such as Violette Hâtive† to a Peach, and Brinion, corrupted from Brugnon, to a melting Nectarine, are absolutely improper. As, however, almost every nurseryman in England is now cultivating fruits under these names, it will, I fear, be difficult, at least for the present, to assign others which shall supersede them.

In the following list the synonyms, whether French or English, are placed in italics below the name which I consider the proper one to be adopted for the variety. Where a French name belongs to the same kind as an English name, the former is placed as a synonym of the latter.

Some previous explanation and observations are necessary

* Traité des Arbres Fruitiers par Duhamel, Vol. ii. p. 4.

† Miller, in his Dictionary, has fallen into an error in describing his *Lisle Peach*; he says the French call it *La Petite Violette Hâtive*, which cannot be correct.

on the authorities from whence the names which I have adopted are derived,

For the English fruits I have taken the enumeration of MILLER, in the eighth edition of his *Gardener's Dictionary*, as the basis of my Catalogue, and have introduced all his kinds without exception, quoting them as his. In the Epitome of the *Hortus Kewensis*, and in the *Pomona Londinensis* of Mr. HOOKER, some kinds are found which appear not to have been known to MILLER; these also are enumerated on their respective authorities. The new varieties mentioned or described in the *Transactions of the Horticultural Society*, have been quoted from that publication. There are a few instances where the authors of Papers, printed in those Volumes, have applied names to old varieties, which are not supported by the sanction of any of the standard works above mentioned; these names I have also thought it necessary to introduce, protesting at the same time against their inaccuracy, and the impropriety of their use.

The varieties enumerated in the last (seventh) edition of FORSYTH on Fruit trees, which are not to be met with in any of the publications to which I have referred, have been also incorporated, not in deference to the authority of that work, but because it is the only printed record at present existing of their names. Besides all these, there are many kinds well known to gardeners, which are only noticed in the printed or manuscript Catalogues of nurserymen. These, as far as my own knowledge of them would admit, I have also introduced, omitting all of that description with which I am not acquainted.

For the French varieties the authority of DUHAMEL in his

Traité des Arbres Fruitiers, is so paramount that his kinds have been adopted on his authority without omission. The list has been otherwise completed from the *Pomone Française* of the Count LELIEUR, the *Jardin Fruitier* of M. NOISETTE, and the *Bon Jardinier* for 1824. There are some instances, in which the *Bon Jardinier* of 1822 is quoted, and the Catalogues of the French nurserymen are also referred to as authority for some few names.

All the sorts which are inserted in the following arranged list are so placed, either on my own personal knowledge, or on such evidence as may be confidently relied on. In those cases where I had any doubt, or had not a perfect acquaintance with all the necessary characters, I have omitted the names in the arrangement and placed them in a supplemental list. To the whole I have appended an Alphabetical List of all the names, whether of Peaches or Nectarines, which are herein noticed.

A LIST OF PEACHES AND NECTARINES,

ARRANGED ACCORDING TO THE PLAN ABOVE PROPOSED.

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* *Is prefixed to the names introduced only from the French authorities.*
** *Have been transferred from the French into the English Catalogues, and are known by these names to English gardeners. The other names are exclusively English.*

Class I. Division I. Subdivision I. Section I.
Serrated glandless leaves. Large flowers. Peaches. Clingstones.

1. Old Newington, Miller.
2. *Pavie Madeleine, Duhamel.
   - **Pavie Blanc*, Duhamel.
   - **Pavie Magdeleine*, Bon Jardinier.
   - **Persèque à gros fruit blanc*, Bon Jardinier, 1822.
   - **Mélecoton*, Bon Jardinier, 1822.
   - **Myrecoton*, Bon Jardinier, 1822.
   - **Merlicoton*, Bon Jardinier, 1822.
3. Smith's Newington, Miller.
   - *Early Newington*, Miller.
   - *Newington*, Hort. Transactions.

Class I. Division I. Subdivision I. Section II.
Serrated glandless leaves. Large flowers. Peaches. Melters.

4. **Cardinal, Lelieur, Forsyth.
   - **La Cardinale*, Duhamel.
   - **Cardinale de Furstemberg*, Bon Jardinier.

5. ** D'Ispahan, Lelieur, Forsyth.
   * *Pêcher de Perse*, French Catalogues.
6. Double Montagne, Forsyth.
   Montagne, Aiton's Epitome.
7. Early Anne, Nurs. Catalogues.
   Anne, Forsyth.
8. Ford's Seedling, Forsyth.
9. Hemskirk, Forsyth.
10. ** Madeleine de Courson, Duhamel, Nurs. Catalogues.
    * *Madeleine Rouge*, Duhamel.
    * *Rouge Paysanne*, Bon Jardinier.
    Red Magdalen of Miller, (1) Miller.
11. Malta, Miller.
    Italian, Miller.
    * *Pêche Malte*, Duhamel.
    * *Pêche de Malte*, Lelieur.
    * *Belle de Paris*, Bon Jardinier.
12. Montauban, Miller.
13. Noblesse, (2) Aiton's Epitome.
    Noblest, Miller.
    Mellish's Favourite, (3) Nurs. Catalogues.

(1) I have never met with either MILLER's Red Magdalen Peach, or his Elruge Nectarine, nor do I think they are cultivated at present by any nurseryman in England; but as MILLER states that his Red Magdalen Peach is the same as Madeleine de Courson, it has been inserted as such upon his authority.

(2) In HOOKER's *Pomona* the figure of the Noblesse is not correct, because it has either been taken from an imperfect specimen with its crown hollow, or from a Vanguard fruit, which is similar to the Noblesse in all points, except that the crown of the latter is usually a little pointed.

(3) I have examined both flowers and fruit of Mellish's Favourite Peach, upon a tree sent by Mr. MELLISH to his sister Mrs. GURDON of Letton, in Norfolk, and I could perceive no difference between them and those of the Noblesse.

14. *Pêcher Nain, Duhamel.
    **Pêcher Nain d'Orléans*, Duhamel.
    Dwarf Orleans, Forsyth.
15. Old Royal Charlotte, (4) Nurs. Catalogues.
    Royal Charlotte, Nurs. Catalogues.
16. **Sanguinole, Duhamel, Forsyth.
    **Betterave*, Duhamel.
    **Druselle*, Duhamel.
    Bloody, Miller.
17. Sawed-leaved, Nurs. Catalogues.
18. Scarlet Admirable, Nurs. Catalogues.
    Dragon, Forsyth.
19. Sion, Miller.
20. Vanguard, Forsyth.
21. White Magdalen, Miller.
    **Madeleine Blanche*, Duhamel.
    **Montagne Blanche*, Bon Jardinier.
22. White Nutmeg, Miller.
    **Avant Pêche Blanche*, Duhamel.
    Avant Blanche, Nurs. Catalogues.

(4) The Old Royal Charlotte was propagated by Robert Lowe, a nurseryman at Hampton Wick, in 1760. He had been foreman in the Royal Gardens at Hampton Court, where the original tree was then growing. It is confounded by the nurserymen with the *true* Royal Charlotte which will be found in a succeeding section.

CLASS I. DIVISION I. SUBDIVISION II. SECTION I.
Serrated glandless leaves. Large flowers. Nectarines.
Clingstones.

23. Black Newington, Forsyth.
Early Newington, Aiton's Epitome.
Lucombe's Seedling, Nurs. Catalogues.
Luccomb's Black, Forsyth.
24. Late Newington, Aiton's Epitome.
25. Newington, Miller.
Scarlet Newington, (5) Nurs. Catalogues.
26. Princess Royal, Forsyth.
27. Rogers's Seedling, Forsyth.
28. Saint Omer's, Forsyth.

CLASS I. DIVISION I. SUBDIVISION II. SECTION II.
Serrated glandless leaves. Large flowers. Nectarines. Melters.

29. Elruge of Miller, (6) Miller.

CLASS I. DIVISION II. SUBDIVISION I. SECTION II.
Serrated glandless leaves. Middle flowers. Peaches. Melters.

30. *Magdeleine à moyennes fleurs, Lelieur.
**Magdeleine Rouge Tardive*, Bon Jardinier.
**Magdeleine à petites fleurs*, Bon Jardinier.
31. Almond Peach, Hort. Transactions.

(5) The Scarlet Newington Nectarine is the Newington of MILLER, and is sold in most nurseries under the name of Newington only.

(6) There can be no doubt of this Nectarine having been in existence at the time of MILLER; and that it was the kind raised by Mr. GURLE, a nurseryman at Hoddesden, about 1670. I fear, however, that it is now lost out of the nurseries. Elruge is a sort of anagram of GURLE.

CLASS I. DIVISION III. SUBDIVISION I. SECTION II.
Serrated glandless leaves. Small flowers. Peaches. Melters.

32. Bear's Early, Aiton's Epitome.
33. **Belle de Vitry, (7) Duhamel, Nurs. Catalogues.
Late Admirable, Forsyth.
Bellis, Miller.
**Admirable Tardive*, Duhamel.
34. Early Purple, Forsyth.
35. Lockyer's Mignonne, Nurs. Catalogues.
Lockyer's, Forsyth.
36. Lord Fauconberg's Mignonne, Forsyth.
37. Millet's Mignonne, Forsyth.
38. Red Magdalen, Aiton's Epitome.
Magdalen, Hort. Transactions.
39. Royal Charlotte, (8) Nurs. Catalogues.
Early Purple (of Kew,) Aiton's Epitome.
40. Royal George, Aiton's Epitome.
41. Royal George Mignonne, Nurs. Catalogues.
42. *Madeleine Tardive, Duhamel.

CLASS I. DIVISION III. SUBDIVISION II. SECTION II.
Serrated glandless leaves. Small flowers. Nectarines. Melters.

43. Hunt's Early Tawny, Nurs. Catalogues.

(7) The Belle de Vitry of the *Bon Jardinier*, is different from the Belle de Vitry of DUHAMEL, and will be found in a future section.

(8) This is very different from the Old Royal Charlotte, mentioned in a preceding section. It is propagated only on French stocks; the other takes freely on the Muscle stock.

Class II. Division I. Subdivision I. Section II.
Crenated leaves with globose glands. Large flowers. Peaches. Melters.

44. Barrington, Nurs. Catalogues.

45. ** Belle Bausse, Bon Jardinier, Nurs. Catalogues.
    ** *Belle Bauce*, Lelieur, Forsyth.

46. * Belle Beauté, Bon Jardinier.

47. Buckingham Mignonne, Forsyth.

48. Early Galande, Nurs. Catalogues.
    Ronalds's Early Galande, Forsyth.

49. Early Vineyard, Aiton's Epitome.

50. ** Grosse Mignonne, (9) Duhamel, Nurs. Catalogues.
    ** *Mignonne*, Duhamel, Hort. Transactions.
    * *Vineuse*, Lelieur.
    Large French Mignonne, Forsyth.
    French Mignonne, Aiton's Epitome.
    French Mignon, Miller.
    Large Mignon, Miller.
    * *Veloutée*, Duhamel.
    * *Veloutée de Merlet*, Duhamel.
    Grimwood's Royal George, (10) Hooker.
    Grimwood's new Royal George, Forsyth.

51. Marlborough, Nurs. Catalogues.

(9) Although two Peaches are cultivated as distinct in England by some nurserymen, under the names of Grosse Mignonne, and French Mignonne, the French themselves have always considered them as one.

(10) This name was given by Mr. Grimwood to plants which he propagated from the Grosse Mignonne in the early part of the reign of George the Third. See *Hooker's Pomona Londinensis*, page 41.

52. *Mignonne Frisée, Bon Jardinier.
** Grosse Mignonne Frisée*, Lelieur.
53. *Mignonne Hâtive, Lelieur.
54. Neil's Early Purple, Hooker.
Neal's Early Purple, Forsyth.
Padley's Early Purple, Nurs. Catalogues.
55. Old Royal George, Forsyth.
56. Royal Kensington, ([11]) Forsyth.
57. Smooth-leaved Royal George, ([12]) Forsyth.
58. Superb Royal, Forsyth.
59. *Véritable Pourprée Hâtive, ([13]) Duhamel.
** Du Vin*, French Catalogues.
Early Purple, Miller.
True Early Purple, Forsyth.
60. *Vineuse de Fromentin, Bon Jardinier.

CLASS II. DIVISION I. SUBDIVISION II. SECTION II.
Crenated leaves with globose glands. Large flowers.
Nectarines. Melters,

61. Pitmaston Orange, Hort. Transactions.

([11]) This name has been given by some nurserymen to a Peach with small flowers. I have, however, examined the variety growing in the Royal Gardens at Kensington, and am fully satisfied of its being the same as that placed in this section. The original tree was planted next to a Grimwood's Royal George, with the characters of which tree, as respects its flowers and leaves, it corresponded.

([12]) By an error of the press, called Small-leaved Royal George, in Forsyth.

([13]) This is much grown, as M. NOISETTE has informed me, by the gardeners of Montreuil, and is also known to them as the Pêche du Vin.

Class II. Division II. Subdivision I. Section II.
Crenated leaves with globose glands. Middle flowers. Peaches.
Melters.

62. * Avant Pêche Jaune,([14]) Duhamel, Lelieur.
63. Early Admirable, Miller.
Admirable (English), Miller.
* *Admirable* (French), Duhamel.
* *Belle de Vitry*, Bon Jardinier.

Class II. Division III. Subdivision I. Section II.
Crenated leaves with globose glands. Small flowers. Peaches.
Melters.

64. * Pêcher à Feuilles de Saule, Bon Jardinier.
65. ** Bellegarde, ([15]) Duhamel, Miller.
** *Galande*, Duhamel, Hooker.
Gallande, Miller.
* *Noire de Montreuil*, French Catalogues.
66. ** Bourdine, Duhamel, Miller.
Boudin, Forsyth.
* *Bourdin*, Duhamel.
* *Boudine*, Bon Jardinier 1822.
* *Narbonne*, Duhamel.
67. Late Admirable, Nurs. Catalogues.
Royal, Miller.
** *Royale*, Duhamel, Forsyth.

([14]) Duhamel describes the flower of the Avant Pêche Jaune as small, but is corrected by Lelieur.

([15]) There is the same objection to cultivating two distinct Peaches under the names of Bellegarde, and Galande, as in the case of the Grosse and the French Mignonnes, both names having been applied by the best French writers to the same fruit.

68. **Nivette, Duhamel, Miller.
Nivette Véloutée, Duhamel.
Véloutée Tardive, Bon Jardinier.
69. **Téton de Vénus, Duhamel, Miller.
70. Violet Hâtive (of the English), ([16]) Nurs. Catalogues.
71. *Alberge Jaune, ([17]) Duhamel.
Pêche Jaune, Duhamel.
Yellow Alberge, Miller.
Purple Alberge, ([18]) Miller.
Red Alberge, Miller.

CLASS III. DIVISION I. SUBDIVISION I. SECTION I.
Crenated leaves with reniform glands. Large flowers. Peaches.
Clingstones.

72. **Pavie de Pomponne, Lelieur, Nurs. Catalogues.
Gros Persèque Rouge, Bon Jardinier.
Gros Mélecoton, Bon Jardinier.
Pavie Monstrueux, Duhamel.
Pavie Rouge de Pomponne, Duhamel.
Pavie Rouge, Duhamel.
Pavie Camu, Duhamel.
Monstrous Pavy of Pomponne, Miller.

([16]) The impropriety of applying this name to a *Peach*, has been noticed in page 535.

([17]) The blossom of this Peach is described by DUHAMEL as small, but represented in Fig. 5, of the *Traité des Arbres Fruitiers*, erroneously with large flowers.

([18]) Miller has made his Purple or Red Alberge a synonym of the Rossanna, which however does not belong to the same section; the great similarity between the two plants, has led many gardeners to confound them. The Rossanna Peach will be found in a succeeding section.

Class III. Division I. Subdivision I. Section II.
Crenated leaves with reniform glands. Large flowers. Peaches.
Melters.

73. *Abricotée, Duhamel.
Yellow Admirable, Miller.
Orange, Forsyth.
**Admirable Jaune*, Duhamel.
**Pêche d'Abricot*, Duhamel.
**Grosse Pêche Jaune Tardive*, Duhamel.
**Grosse Jaune*, Bon Jardinier.
**Pêche de Burai*, Bon Jardinier.
**Pêche d'Orange*, Bon Jardinier.
**Sandalie Hermaphrodite*, Bon Jardinier.

74. Double-blossomed, Forsyth.
The Double Flower, Miller.
**Pêcher à fleurs semidoubles*, Duhamel.
**Pêcher Nain à fleurs doubles*, Duhamel.
**Pêcher à fleurs doubles*, Lelieur.

75. *Pourprée Hâtive, Duhamel.
**Vineuse*, Duhamel.

76. Red Nutmeg, Miller.
Brown Nutmeg, Forsyth.
Avant Rouge, Nurs. Catalogues.
**Avant Pêche Rouge*, Duhamel.
**Avant Pêche de Troyes*, Duhamel.

Class III. Division I. Subdivision II. Section I.
Crenated leaves with reniform glands. Large flowers.
Nectarines. Clingstones.

77. *Brugnon Violet Musqué, Duhamel.
**Brugnon*, Duhamel.
**Brugnon Musqué*, Lelieur.

78. Roman, (19) Aiton's Epitome.
Roman Red, Miller.
Red Roman, Forsyth.
Brugnon Musqué, Aiton's Epitome.

CLASS III. DIVISION I. SUBDIVISION II. SECTION II.
Crenated leaves with reniform glands. Large flowers.
Nectarines. Melters.

79. ** Desprez, Jardin Fruitier, Forsyth.
* *Desprès,* Bon Jardinier.
* *Deprez,* Lelieur,
80. Fairchild's, Aiton's Epitome.
Fairchild's Early, Miller.
81. ** Jaune Lisse, Duhamel, Forsyth.
* *Lisse Jaune,* Duhamel.
* *Roussanne,* Bon Jardinier.
82. New White, Forsyth.
White, Hooker.
Flanders, Hooker.
Emmerton's New White, Nurs. Catalogues.
83. Old White, Nurs. Catalogues.
White, Aiton's Epitome.
84. Vermash, (20) Hooker.
True Vermash, Forsyth.

(19) The tree which is cultivated and sold by many nurserymen as the Roman or Red Roman Nectarine, and which bears small flowers, is not the Roman Red Nectarine of MILLER, as is very evident from the accurate account that writer has given of his plant. The opinion that the Brugnon Violet Musqué of DUHAMEL is the same as the Roman Red of MILLER, is equally erroneous. I have cultivated both these kinds for many years, and I find them truly distinct.

(20) There is no doubt that this is the real Vermash Nectarine, which is very well figured by Mr. HOOKER in his *Pomona Londinensis.* The tree from which

Class III. Division II. Subdivision I. Section II.
Crenated leaves with reniform glands. Middle flowers. Peaches.
Melters.

85. ** Belle Chevreuse, Duhamel, Miller.
Chevreuse, Miller.
Early Chevreuse, Forsyth.
86. *Chevreuse Hâtive, Duhamel.
87. *Chancellière, Duhamel.
* *Véritable Chancellière à grandes fleurs*, ([21]) Duhamel.
88. Flat Peach of China, Hort. Transactions.
Java Peach, Hort. Transactions.

Class III. Division III. Subdivision I. Section I.
Crenated leaves with reniform glands. Small flowers. Peaches.
Clingstones.

89. Catherine, Miller.
90. Incomparable, Aiton's Epitome.
91. *Pavie Alberge, Duhamel.
** *Pavie Jaune*, Bon Jardinier, Forsyth.
* *Persais d'Angoumois*, Duhamel.
* *Persèque Jaune*, Bon Jardinier.
* *Mélecoton Jaune*, Bon Jardinier, 1822.
* *Grand Myrecoton Jaune*, Bon Jardinier, 1822.

the drawing published in that work was taken, is at Hampton Court, where I have seen it. It was purchased, as I am informed, by Mr. Padley, from Mr. Grimwood of Chelsea, nearly forty years ago. Mr. Hooker's statement that it was brought from France must be a mistake, as the French books contain no account of a red melting Nectarine with large flowers.

([21]) This Peach is called simply Chancellière in his Index by Duhamel, but Véritable Chancellière à grandes fleurs in the Traité. It nevertheless is properly placed in the present section. Duhamel was not in the habit of separating the Peaches with middle sized flowers from those with large flowers.

92. *Pavie Jaune, (22) Duhamel.
93. *Pavie Tardif, Bon Jardinier.
94. **Persique, Duhamel, Miller.
    ** Persèque,* Bon Jardinier;
    ** Gros Persèque,* Bon Jardinier.
    ** Persèque Allongé,* Bon Jardinier.

CLASS III. DIVISION III. SUBDIVISION I. SECTION II.
Crenated leaves with reniform glands. Small flowers. Peaches.
Melters.

95. Chancellor, Miller.
    ** Chancellière variety,* Duhamel, page 24, in text.
96. Double Swalsh, Nurs. Catalogues.
    Double Swalch, Forsyth.
    Swalze or Swolze, Forsyth.
    Swalch or Dutch, Miller.
97. Late Chevreuse, Forsyth.
    ** Chevreuse Tardive,* Duhamel.
    ** Pourprée,* Duhamel.
98. Steward's Late Galande, Forsyth.
99. Late Purple, Forsyth.
    ** Pourprée Tardive,* Duhamel.
100. *Petite Mignonne, Duhamel.
    ** Double de Troyes,* Duhamel.
    ** Pêche de Troyes,* Duhamel.
    Small Mignon, Miller.
    Early Mignon, Miller.
    Mignonette, Miller.

(22) The Pavie Jaune is considered a distinct fruit by DUHAMEL, but is made the same as the Pavie Alberge in the Bon Jardinier.

101. Rossanna, Miller.
 * *Rossanne*, Duhamel.
 ** *Rosanne*, Duhamel, Hort. Transactions.
 * *Petite Roussanne*, Bon Jardinier.
 * *Alberge Jaune*, Bon Jardinier.
 * *Pêche Jaune*, Bon Jardinier.
 * *St. Laurent Jaune*, Bon Jardinier.
102. Yellow Mignonne, Hort. Transactions.

Class III. Division III. Subdivision II. Section I.
Crenated leaves with reniform glands. Small flowers.
Nectarines. Clingstones.

103. Golden, Miller.
104. Tawny, Forsyth.

Class III. Division III. Subdivision II. Section II.
Crenated leaves with reniform glands. Small flowers.
Nectarines. Melters.

105. Aromatic, Forsyth.
106. Brugnon red at the stone, Nurs. Catalogues.
 Violet red at the stone, Nurs. Catalogues.
107. Claremont, ([23]) Nurs. Catalogues.
108. Elruge (Common), Aiton's Epitome.
109. Du Tellier's, Aiton's Epitome.
 Duc de Tello, Nurs. Catalogues.
110. Genoa, Nurs. Catalogues.
 Late Genoa, Aiton's Epitome.

([23]) The Claremont Nectarine was raised about 1750, and the tree first produced fruit about 1759, against the south wall in the great Tool-house quarter at Hampton Court. Mr. Padley and some others believe this to be the same as the Elruge of the Nurseries. As, however, they have been kept hitherto separate, I have not made the one a synonym of the other.

111. *Grosse Violette, Bon Jardinier.
** Grosse Violette Hâtive*, Duhamel.
** Violette de Courson*, Bon Jardinier.
112. Murry, Miller.
113. Newfoundland, Forsyth.
114. Peterborough, Miller.
Late Green, Miller.
Vermash, Forsyth.
115. **Pêche Cérise, Duhamel, Forsyth.
Cherry, Forsyth.
116. Royal Chair d'Or, Forsyth.
117. Scarlet, Miller.
118. **Violette Hâtive, Bon Jardinier, Aiton's Epitome.
Violet, Forsyth.
*** Petite Violette Hâtive*, Duhamel, Forsyth.
Early Violet (of Knight), Hort. Transactions.
119. *Violette Tardive, Duhamel.
** Violette Marbrée*, Duhamel.
** Violette Panachée*, Duhamel.
120. *Violette très Tardive, Duhamel.
** Pêche Noix*, Duhamel.

Peaches not included in any of the Classes.

121. Acton Scot, Hort. Transactions.
122. Albemarle, Forsyth.
123. Alberge, Hort. Transactions.
124. Allen's Royal, Forsyth.
125. Bourdeaux, Miller.
Burdock, Forsyth.

126. Braddick's North American, Hort. Transactions.
Braddick's American, Forsyth.
127. Braddick's New York, Hort. Transactions.
128. Cambray, Forsyth.
129. Carlisle. Miller.
130. Early Downton, Hort Transactions.
131. Early Purple Avant, Forsyth.
132. Eaton, Miller.
133. Fairscot's, Forsyth.
134. French Magdalen, Hort. Transactions.
135. French Mignonne (with small flowers), Nurs. Catalogues.
136. Kendall's Buenos Ayres, Hort. Transactions.
137. La Pourprée, Miller.
Pourprée Tardive (of the French), Miller
138. Lisle, Miller.
139. Low's Large Melting, Forsyth.
140. Mallacoton, Forsyth.
141. Mountaineer, Hort. Transactions.
142. Pavie Admirable, Forsyth.
143. *Pêche d'Italie, Duhamel.
144. **Pêche de Pau, Duhamel, Miller.
145. Portugal, Miller.
146. Queen Charlotte, Forsyth.
147. Rambouillet, Miller.
Rumbullion, Miller.
148. Royal Kensington (with small flowers), Nurs. Catalogues.
149. Royal Pavy, Aiton's Epitome.
150. Spring Grove, Hort. Transactions.
151. Spring Grove Persian, Hort. Transactions.
152. Sulhampstead, Hort. Transactions.

153. *Tein-doux, Duhamel.
**Teindou*, Duhamel, Forsyth.
154. Willow-leaved late Newington, Forsyth.
155. White-blossomed, Forsyth.

NECTARINES NOT INCLUDED IN ANY OF THE CLASSES.

156. Aiton's Seedling, Hort. Transactions.
157. Anderdon's, Forsyth.
158. Brugnon, Miller.
Italian, Miller.
159. Cowdray White, Hort. Transactions.
160. Downton, Hort. Transactions.
161. Early Pavie, Forsyth.
162. Ord's, Nurs. Catalogues.
163. Red Roman (with small flowers), Nurs. Catalogues.
164. Temple's, Miller.
Temple, Nurs. Catalogues.

ALPHABETICAL LIST OF THE PEACHES.

N. B. The Figures refer to the enumeration of the preceding List.

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Avant Pêche Jaune, Duhamel, Lelieur, 62.
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Bear's Early, Ait. Epit. 32.
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Belle Beauté, Bon Jard. 46.
Belle Chevreuse, Duhamel, Miller, 85.
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Pourprée Tardive, Duhamel, 99.
Pourprée Tardive, (of the French), Miller, 137.
Purple Alberge, Miller, 71.

Queen Charlotte, Forsyth, 146.

Rambouillet, Miller, 147.
Red Alberge, Miller, 71.
Red Magdalen, Ait. Epit. 38.
Red Magdalen of Miller, Miller, 10.
Red Nutmeg, Miller, 76.
Ronalds's Early Galande, Forsyth, 48.
Rossanna, Miller, 101.
Rosanne, Duhamel, Hort. Trans. 101.

Rossanne, Duhamel, 101.
Rouge Paysanne, Bon Jard. 10.
Royal, Miller, 67
Royale, Duhamel, Forsyth, 67.
Royal Charlotte, Nurs. Cat. 15.
Royal Charlotte, Nurs. Cat. 39.
Royal George, Ait. Epit. 40.
Royal George Mignonne, Nurs. Cat. 41
Royal Kensington, Forsyth, 56.
Royal Kensington, (with small flowers), Nurs. Cat. 148.
Royal Pavy, Ait. Epit. 149.
Rumbullion, Miller, 147.

St. Laurent Jaune, Bon Jard. 101.
Sandalie Hermaphrodite, Bon Jard. 73.
Sanguinole, Duhamel, Forsyth, 16.
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Scarlet Admirable, Nurs. Cat. 18.
Sion, Miller, 19.
Small Mignon, Miller, 100.
Smith's Newington, Miller, 3.
Smooth-leaved Royal George, Forsyth, 57.
Spring Grove, Hort. Trans. 150.
Spring Grove Persian, Hort. Trans. 151.
Steward's Late Galande, Forsyth, 98.
Sulhampstead, Hort. Trans. 152.
Superb Royal, Forsyth, 58.
Swalch or Dutch, Miller, 96.
Swalze or Swolze, Forsyth, 96.

Teindou, Duhamel, Forsyth, 153.
Tein-doux, Duhamel, 153.
Têton de Venus, Duhamel, Miller, 69.
True Early Purple, Forsyth, 59.

Vanguard, Forsyth, 20.
Veloutée, Duhamel, 50.
Veloutée de Merlet, Duhamel, 50.
Véloutée Tardive, Bon Jard. 68.
Véritable Chancellière à grandes fleurs, Duhamel, 87.
Véritable Pourprée Hâtive, Duhamel, 59.
Vineuse, Duhamel, 75
Vineuse, Lelieur, 50.
Vineuse de Fromentin, Bon Jard. 60.
Violet Hâtive (of the English); Nurs. Cat. 70.

White blossomed, Forsyth, 155.
White Magdalen, Miller, 21.
White Nutmeg, Miller, 22.
Willow-leaved Late Newington, Forsyth, 154.

Yellow Admirable, Miller, 73.
Yellow Alberge, Miller, 71.
Yellow Mignonne, Hort. Trans. 102.

ALPHABETICAL LIST OF THE NECTARINES.

Aiton's Seedling, Hort. Trans. 156.
Anderdon's, Forsyth, 157.
Aromatic, Forsyth, 105.

Black Newington, Forsyth, 23.
Brugnon, Miller, 158.
Brugnon, Duhamel, 77.
Brugnon Musqué, Lelieur, 77.
Brugnon Musqué, Ait. Epit. 78.
Brugnon red at the stone, Nurs. Cat. 106.
Brugnon Violet Musqué, Duhamel, 77.

Cherry, Forsyth, 115.
Claremont, Nurs. Cat. 107.
Cowdray White, Hort. Trans. 159.

Deprez, Lelieur, 79.
Desprès, Bon Jard. 79.
Desprez, Jard. Fruit. Forsyth, 79.
Duc de Tello, Nurs. Cat. 109.
Du Tellier's, Ait. Epit. 109.
Downton, Hort. Trans. 160.

Early Newington, Ait. Epit. 23.
Early Pavie, Forsyth, 161.
Early Violet (of Knight), Hort. Trans. 118.
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Elruge of Miller, Miller, 29.
Emmerton's New White, Nurs. Cat. 82.

Fairchild's, Ait. Epit. 80.
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Flanders, Hooker, 82.

Genoa, Nurs. Cat. 110.
Golden, Miller, 103.
Grosse Violette, Bon Jard. 111.
Grosse Violette Hâtive, Duhamel, 111.

Hunt's Early Tawny, Nurs. Cat. 43.

Italian, Miller, 158.

Jaune Lisse, Duhamel, Forsyth, 81.

Late Genoa, Ait. Epit. 110.
Late Green, Miller, 114.
Late Newington, Ait. Epit. 24.
Lisse Jaune, Duhamel, 81.
Luccomb's Black, Forsyth, 23.
Lucombe's Seedling, Nurs. Cat. 23.

Murry, Miller, 112.

Newfoundland, Forsyth, 113.
Newington, Miller, 25.
New White, Forsyth, 82.

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Pêche Cérise, Duhamel, Forsyth, 115.
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Petite Violette Hâtive, Duhamel, Forsyth, 118.
Pitmaston Orange, Hort. Trans. 61.
Princess Royal, Forsyth, 26.

Red Roman, Nurs. Cat. 163.
Red Roman, Forsyth, 78.
Rogers's Seedling, Forsyth, 27.
Roman, Ait. Epit. 78.
Roman Red, Miller. 78.
Roussanne, Bon Jard. 81.
Royal Chair d'Or, Forsyth, 116.

Saint Omer's, Forsyth, 28.
Scarlet, Miller, 117.
Scarlet Newington, Nurs. Cat. 25.

Tawny, Forsyth, 104.
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Temple's, Miller, 164.
True Vermash, Forsyth, 84.

Vermash, Forsyth, 114.
Vermash, Hooker, 84.
Violet, Forsyth, 118.
Violet red at the stone, Nurs. Cat. 106.
Violette de Courson, Bon Jard. 111.
Violette Hâtive, Bon Jard. Ait. Epit. 118
Violette Marbrée, Duhamel, 119.
Violette Panachée, Duhamel, 119.
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APPENDIX.

I. *At a special General Meeting of the Society held on the* 1*st of October,* 1822, *for the purpose of electing a Member of the Council in the room of Mr.* JAMES DICKSON *deceased, the following Biographical Sketch was read by the Secretary.*

I AM unwilling to allow the opportunity which this occasion presents, to elapse without offering a few words relative to the respected individual whose death has caused the vacancy in the Council of the Society which we have this day to fill up.

Born in an humble station, and in early life following a laborious employment, his active mind devoted itself to explore the *science* of that *art* in the practical part of which only he had been instructed. Passionately devoted to the study of plants and other objects of Natural History the want of education formed but a feeble bar to the progress of his acquirements. His sober and correct habits, and his unceasing perseverance in his favourite pursuits, gave him access to a range in Society to which, in this country, nothing but talent and integrity of conduct can elevate the humble, but from which the man of talent and integrity is never excluded.

Mr. Dickson was born at Kirke House, in the Parish of Traquhair, in the County of Peebles, in the year 1738. In the gardens of the Earl of Traquhair he acquired the rudiments of horticultural knowledge, and coming while very young to England, he improved himself in the Nursery of Mr. Jeffery at Brompton, near London.

Subsequently and until he began business upon his own account and established a shop in Covent Garden, in the year 1772, he filled several respectable situations as a Gardener.

It was Mr. Dickson's good fortune, while a young man, to become acquainted with Mr. Lee, the founder of the Nursery at Hammer-

smith, to whose attentions and encouragement he owed much, and with whom a friendship was formed which terminated only upon the death of Mr. Lee. He also had the happiness to become known to Sir Joseph Banks at the period when the latter was a Student at Oxford. The ardour with which Mr. Dickson pursued his enquiries, not only in Botany, but in Ornithology and Conchology, strongly recommended him to the attention of that eminent Naturalist and Patron of Science; and many years after, when Sir Joseph fixed his winter residence in London, and was surrounded by the most learned of his country, he renewed his friendship with Mr. Dickson, who was a frequent guest at his table.

Mr. Dickson was among the earliest members of this Society, being one of the eight who first met to consider of its foundation, and he was one of the Vice Presidents originally named; an appointment which was annually continued till his death. He was also an early Member of the Linnean Society, and to both Societies his attentions were constantly directed, as is shown by the various communications from him in the Transactions of the respective Societies.

It is often curious to remark what the impulses are that actuate the minds of youth in forming their choice of a pursuit; an anecdote which I have heard is interesting, as shewing how trifling an occurrence directed the mind of our deceased Vice President, in the first instance, to the study of Botany. While yet a boy his attention was awakened to Botanical research by his hearing one of his playmates enquire of another the name of a wild plant, the Star of the Earth (Plantago Coronopus) which grew near them; and finding the boy applied to able to answer the question. Excited by this circumstance, young Dickson became desirous of also knowing the plants he met with in his walks, and from that moment resolved to apply himself to the study of them.

Few resolutions made so early have been so steadily adhered to, during a very long life, uninterrupted by ill health. Mr. Dickson

never lost sight of his favourite study, and by his diligence and accuracy in the investigation of a then neglected branch of Botany (the Mosses) he established for himself an imperishable reputation.

In 1785 he published the first Fasciculus *Plantarum Cryptogamicarum Britanniæ,* and this was followed by three other Fasciculi in the years 1790, 1793 and 1801. The materials for this work were in great part collected by him during tours made in the Highlands of Scotland in the year 1785, and several subsequent years, until 1791. In the tour made by him in 1789, he was accompanied by the enterprising and unfortunate Mungo Park. In 1793 he began the publication of his *Hortus Siccus Britannicus,* which was continued till 1802, and then completed in 19 Fasciculi.

Mr. Dickson was twice married, the second time to a Sister of Mr. Park, who survives him. He died at his house near Croydon on the 14th of August last, in the 85th year of his age, leaving two daughters, and a son who succeeds him in his business, and whom I have this day to propose as a Candidate to become a Fellow of this Society.

APPENDIX. No. II.

II. *A List of* Pears *cultivated in France and the Netherlands, with the Periods of their Maturity, their Quality, Size, and Flavour, &c. By Le Chevalier* JOSEPH PARMENTIER, *Corresponding Member of the Horticultural Society.*

THE following List of Pears was communicated to the Society by M. PARMENTIER, principally with a view to furnish a correct standard of orthography, many of our Catalogues being very faulty in this respect. Most of the new Flemish Pears will be found in the List, but not the whole of them, M. PARMENTIER having inserted those only, of the qualities of which he could speak from experience. In translating M. PARMENTIER's terms, the word *cassante* has been rendered by *crisp*, as more expressive than *breaking*, and the word *espalier* is used in the same sense as by the English Gardeners; namely, a tree trained upon a trellis in the open border, not trained on a wall, as the French word implies.

	Name.	Time of ripening.	Quality.	Size.	Flavour.	Situation.
1	Ambrette d'hiver.	November.	Melting.	Middle.	Good.	Wall and Espalier.
2	Amiré roux.	September.	Melting.	Small.	Moderate.	Standard.
3	Ananas.	Autumn.	Melting.	Middle.	Good.	Wall and Espalier.
4	Angls Pyre.	Winter	Crisp.	Large.	Moderate.	Wall.
5	Angélique de Bourdeaux.	March.	Crisp.	Large.	Moderate.	Wall.
6	Archiduc d'été.	September.	Slightly Melting.	Small.	Moderate.	Standard.
7	Bayomont condrosienne.	Autumn.	Melting. Sugared.	Middle.	Very good.	Wall, Esp. Stand.
8	Beau Présent, or Cuisse Madame.	August.	Melting.	Large.	Good.	Standard.
9	Beau St. Bernard.	Autumn.	Melting. Sugared.	Large.	Very good.	Wall, Esp. Stand.
10	Belle et Longue.	November.	Melting.	Large.	Good.	Standard.
11	Bellissime.	September.	Melting.	Large.	Moderate.	Standard.
12	Bergamotte Brocas.	Winter,	Melting.	Large.	Good.	Wall and Espalier.
13	——— Bussy.	Feb. March.	Melting.	Middle.	Moderate.	Wall, and Espalier.
14	——— Cassolette.	September.	Melting.	Middle.	Good.	Standard.
15	——— Crassane.	December,	Melting.	Large.	Very good.	Wall.
16	——— d'été.	September.	Melting.	Small.	Good	Standard.

	Name.	Time of ripening.	Quality.	Size.	Flavour.	Situation.
17	Bergamotte de Hollande.	Winter.	Melting.	Large.	Moderate.	Wall and Standard.
18	——— de Metz.	Winter.	Melting.	Middle.	Good.	Wall and Standard.
19	——— de Pâques.	March. April.	Crisp.	Large.	Moderate.	Wall and Standard.
20	——— Dertrycker.	October.	Melting.	Middle.	Good.	Wall and Standard.
21	——— Mignonne.	September.	Melting.	Small.	Good.	Standard.
22	——— Niza.	April. May.	Crisp.	Middle.	Moderate.	Wall.
23	——— Paysans.	September.	Melting.	Middle.	Very good.	Standard.
24	——— de Pentecôte.	May. June.	Crisp.	Large.	Good.	Standard.
25	——— Quercy.	April. May.	Half Melting.	Middle.	Moderate.	Wall and Espalier.
26	——— Ronville,	October.	Crisp.	Middle.	Moderate.	Standard.
27	——— Silvange.	Autumn.	Melting. Sugared.	Large.	Good.	Wall and Standard.
28	——— Soulers.	Autumn.	Melting. Sugared.	Large.	Good.	Wall.
29	——— Suisse.	October.	Melting.	Middle.	Good.	Wall, Esp. Stand.
30	Beurré blanc.	November.	Melting.	Large.	Very good.	Wall.
31	——— Capiaumont.	November.	Melting.	Middle.	Very good.	Standard.
32	——— Bosc.	Autumn.	Melting. Sugared.	Large.	Good.	Wall, Esp. Stand.
33	——— Coloma.	Autumn.	Melting. Sugared.	Large.	Good.	Wall and Standard.
34	——— Crappaux.	November.	Melting.	Middle.	Very good.	Standard.
35	——— d'Afflighem.	November.	Melting.	Middle.	Very good.	Standard.
36	——— d'Angleterre.	September.	Melting.	Large.	Good.	Standard.
37	——— d'Aremberg.	Jan. Feb.	Melting.	Large.	Very good.	Wall.
38	——— de Caen.	Autumn.	Melting. Sugared.	Middle.	Good.	Standard.
39	——— Diel.	December.	Melting.	Very large.	Very good.	Wall and Standard.
40	——— doré, dit d'Ausson.	Autumn.	Melting. Sugared.	Large.	Good.	Wall and Standard.
41	——— Duval.	November.	Melting.	Large.	Good.	Standard.
42	——— Duquesne.	Autumn.	Melting.	Large.	Good.	Standard.
43	——— gris doré.	Winter.	Melting.	Large.	Very good.	Standard Espalier.
44	——— Extra.	November,	Melting.	Large.	Good.	Standard.
45	——— Gris.	November.	Melting.	Very large.	Very good.	Wall.
46	——— Rance.	March. April	Melting.	Large.	Very good.	Wall and Standard.
47	——— rouge.	Autumn,	Melting. Sugared.	Large.	Good.	Wall Stand. Esp.
48	——— vert.	Autumn.	Melting.	Middle.	Good.	Wall and Espalier.
49	Besy Chaumontel.	January.	Crisp.	Large.	Good.	Wall and Standard.
50	——— d'Hery.	November.	Crisp.	Small.	Middling.	Standard.
51	——— Vaet.	January	Melting.	Large.	Very good.	Standard.
52	——— de Caissoy.	April.	Melting.	Middle.	Good.	Standard.
53	——— de Chassery.	Winter.	Melting.	Small.	Moderate.	Wall and Espalier.
54	——— de la Motte.	November.	Melting.	Large.	Good.	Standsrd.
55	Bon Chrétien d'été.	Sept. Oct.	Crisp.	Middle.	Good.	Standard.
56	——— d'Angleterre.	April.	Crisp.	Large.	Moderate.	Wall.
57	——— d'Auch.	Winter.	Crisp.	Large.	Very moderate.	Wall and Espalier.
58	——— d'été doré.	September.	Crisp.	Large.	Moderate.	Espalier.
59	——— d'hiver.	May. June.	Crisp.	Very large.	Good.	Wall.
60	——— Turc.	November,	Crisp.	Large.	Moderate.	Standard.
61	Bostonienne.	August.	Melting.	Middle.	Good.	Standard.
62	Bourdon musqué.	April.	Crisp.	Middle.	Moderate.	Wall and Espalier.
63	Bourgmestre.	November.	Melting.	Large.	Very good.	Wall.
64	Bosch.	October.	Melting.	Large.	Good.	Standard.
65	Calebasse de Hollande.	Autumn.	Crisp.	Large.	Good.	Wall and Staudard.
66	Calbasse.	October.	Melting.	Large.	Good.	Standard.
67	Caillot rosat.	October.	Melting.	Large.	Good.	Wall and Standard.
68	Camerling Allemand.	Autumn.	Melting. Sugared.	Middle.	Good.	Wall, Esp. Stand.
69	Canivette.	April. May.	Crisp.	Middle.	Good.	Wall and Espalier.
70	Chaptal.	Dec. Jan.	Crisp.	Large.	Moderate.	Standard.
71	Charles d'Autriche.	Autumn.	Melting. Sugared.	Large.	Good.	Wall. Esp. Stand.
72	Citron de Carmes.	August.	Melting.	Middle.	Moderate.	Standard.
73	Citronelle.	September.	Melting.	Middle.	Moderate.	Standard.
74	Colmar musqué.	Autumn.	Melting.	Middle.	Good.	Wall, Esp. Stand.
75	Colmar (le petit).	Winter.	Melting. Sugared.	Small.	Good.	Wall to the South.
76	Colmar.	March. April.	Melting.	Large.	Very good.	Wall.
77	Cramoisine.	August.	Crisp.	Large.	Good.	Standard.

	Name.	Time of ripening.	Quality.	Size.	Flavour.	Situation.
78	Crassane Antoine.	November.	Melting.	Middle.	Good.	Wall and Espalier.
79	Delices d'Ardenpont.	November.	Melting.	Large.	Very good.	Wall.
80	Delices de Charles.	Winter.	Melting. Sugared.	Large.	Very good.	Wall and Espalier-
81	Dorothée (la).	January.	Crisp.	Large.	Middling.	Wall or Standard.
82	Double Rousselet.	October.	Melting.	Middle.	Good.	Standard.
83	Duc de Berry.	October	Melting.	Middle.	Good.	Standard.
84	Duchesse de Mars.	March.	Melting.	Large.	Good.	Wall or Standard.
85	Dupré.	August.	Melting.	Small.	Good.	Standard.
86	Epine d'hiver.	Octob .	Melting.	Large.	Good.	Standard.
87	Echasserie, ou Poire d'œuf.	Septemb r.	Crisp.	Middle.	Moderate.	Standard.
88	Epine rouge.	August.	Melting.	Small.	Moderate.	Standard.
89	Epine verte d'été.	August.	Melting.	Small.	Good.	Standard.
90	Fondante d'Havay.	Sept. Oct.	Melting.	Large.	Very good.	Standard.
91	——— de Brest.	October.	Melting.	Middle.	Very good.	Standard.
92	——— Batave.	April.	Melting.	Middle.	Good.	Standard.
93	——— Pariselle.	Winter.	Melting. Sugared.	Large.	Good.	Wall and Standard.
94	Favorite (la).	April.	Crisp.	Middle.	Good.	Wall and Espalier.
95	Fourcroy, or Merveille de la nature.	Autumn.	Melting. Sugared.	Large.	Very good.	Wall, Esp. Stand.
96	Franchipane.	October.	Melting. Sugared.	Middle.	Moderate.	Standard.
97	Gloux Morceau.	Dec. Jan.	Melting.	Large.	Very good.	Wall or Standard.
98	Gloutonne Dupuis.	September.	Melting.	Large.	Moderate.	Standard.
99	Gratiole.	August.	Melting.	Very large.	Very good.	Wall.
100	Goutte d'or.	September.	Melting.	Middle.	Moderate.	Wall.
101	Gros Cerceau.	December.	Crisp.	Large.	Moderate.	Standard.
102	Gros Romain.	March. April.	Crisp.	Large.	Moderate.	Staudard.
103	Grosse Queue (la).	September.	Crisp.	Middle.	Moderate.	Standard.
104	Gros Blanquet.	July.	Melting.	Large.	Good.	Wall and Standard.
105	Gros Monarque.	October.	Half Melting.	Large.	Moderate.	Espalier.
106	Gros Mouflin.	April.	Crisp.	Large.	Moderate.	Wall and Espalier.
107	Gros Muscat.	July.	Melting. Sugared.	Middle.	Good.	Standard.
108	Gros Palentin.	November.	Melting.	Middle.	Moderate.	Espalier.
109	Grosse Bergamotte.	Autumn.	Melting. Sugared.	Large.	Good.	Wall, Esp. Stand.
110	Jargonelle.	August.	Melting. Sugared.	Small.	Very good.	Standard.
111	Incommunicable (l').	Feb. March.	Crisp.	Middle.	Moderate.	Wall.
112	Josephine.	Winter.	Melting. Sugared.	Large.	Very good.	Wall, Esp. Stand.
113	Louise Bonne.	January.	Melting.	Large.	Good.	Standard.
114	Madame Verte.	Autumn.	Melting. Sugared.	Middle.	Good.	Wall, Esp. Stand.
115	Magdeleine (la).	August.	Melting.	Small.	Moderate.	Standard.
116	Marie Louise.	November.	Melting.	Large.	Very good.	Standard.
117	Marquise (la).	December.	Crisp.	Large.	Moderate.	Wall.
118	Martin Sec.	December.	Crisp.	Middle.	Moderate.	Standard.
119	Martin Sec de Provins.	November.	Melting. Sugared.	Small.	Moderate.	Standard.
120	Mary (la).	Sept. Oct.	Melting. Sugared.		Good.	Wall, Stand. Esp.
121	Merveille d'hiver.	November.	Melting. Sugared,	Large.	Moderate.	Wall and Espalier.
122	Messire Jean doré.	Autumn.	Melting.	Large.	Moderate.	Wall and Espalier.
123	Messire Jean gris.	November.	Crisp.	Middle.	Moderate.	Standard.
124	Merveille d'été.	September.	Melting.	Middle.	Moderate.	Standard.
125	Milanoise, or Grande Bretagne.	Nov. Dec.	Crisp.	Lerge.	Good.	Wall.
126	——— Cuvelier.	Dec. Jan.	Melting.	Large.	Very good.	Wall.
127	Mouille Bouche.	September.	Melting.	Middle.	Moderate.	Standard.
128	Muscat Allemand.	April. May.	Melting.	Middle.	Moderate.	Standard.
129	Muscat Robert.	July.	Half Melting.	Middle.	Moderate.	Standard.
130	Napoleon.	November.	Melting.	Large.	Very good.	Standard.
131	Nouvelle doré.	Sept. Oct.	Mel,ing.	Large.	Good.	Standard.
132	Orange d'été.	August.	Crisp.	Middle.	Moderate.	Standard.
133	——— d'hiver.	Feb. March.	Crisp.	Middle.	Moderate.	Standard.
134	——— Nouvelle.	September.	Melting. Sugared.	Middle.	Moderate.	Wall, Esp. Stand.
135	Oeuf de Cigne.	November.	Crisp.	Large.	Moderate.	Wall and Espalier.
126	Palentin.	August.	Melting.	Middle.	Good.	Standard.
137	Passa tutti.	November.	Crisp.	Large.	Moderate.	Standard.
138	Passe Colmar.	Jan. Feb.	Melting,	Large.	Very good.	Wall or Standard.

	Name.	Time of ripening.	Quality.	Size.	Flavour.	Situation.
139	Passe Colmar gris dit Précel.	Jan. Feb.	Melting.	Large.	Very good.	Wall or Standard.
140	Pastorale.	December.	Melting.	Large.	Good.	Wall or Standard.
141	Pastorale or Comperette.	Aut. Win.	Melting. Sugared.	Large.	Good.	Wall, Esp. Stand.
142	Peaux grise.	September.	Crisp.	Middle.	Moderate.	Standard.
143	Pepin sauvé.	April.	Melting.	Middle.	Moderate.	Wall and Espalier.
144	Petit Blanquet.	August.	Melting.	Small.	Good.	Standard.
145	Poire d'Amande.	October.	Melting.	Large.	Good.	Standard.
146	—— de Bel œil.	August.	Crisp.	Middle.	Moderate.	Standard.
147	—— Canning.	Winter.	Melting. Sugared.	Large.	Very good.	Wall, Esp. Stand.
148	—— Charlotte.	Winter.	Melting, Sugared.	Large.	Good.	Wall, Esp. Stand.
149	—— de Capucin.	Jan. Feb.	Crisp.	Large.	Moderate.	Standard.
150	—— d'Argent.	August.	Melting.	Middle.	Moderate.	Standard.
151	—— d'Austrasie.	October.	Crisp.	Large.	Moderate.	Standard.
152	—— de Jesus.	October.	Crisp.	Small.	Moderate.	Standard.
153	—— de Prince.	August.	Melting.	Small.	Good.	Standard.
154	—— de Quinte.	October.	Melting.	Middle.	Moderate.	Standard.
155	—— des Bergers.	January.	Crisp,	Middle.	Moderate.	Wall.
156	—— des Jesuites.	Feb. March.	Half Melting.	Middle.	Moderate.	Wall.
157	—— du Seigneur.	Autumn.	Melting. Sugared.	Middle.	Good.	Wall, Esp. Stand.
158	—— de Figue.	October.	Crisp.	Middle.	Moderate.	Standard.
159	—— d'Or.	October.	Half Melting.	Middle.	Moderate.	Standard.
160	—— grise de Cassiemari.	December.	Melting.	Middle.	Good.	Wall or Standard.
161	—— de Louvain.	Oct. Nov.	Melting.	Middle.	Good.	Standard.
162	—— Mon Dieu rousselet.	September.	Melting.	Small.	Moderate.	Standard.
163	—— de Noirchair.	September.	Melting.	Small.	Very good.	Standard.
164	—— Sans Peau.	October.	Melting.	Large.	Moderate.	Standard.
165	—— Sans Pepin.	November.	Crisp.	Large.	Moderate.	Standard.
166	—— de Ste. Croix.	September.	Melting.	Large.	Good.	Standard.
167	—— de Sucre.	October.	Crisp.	Small.	Moderate.	Standard.
168	—— Pêche.	September.	Melting.	Middle.	Moderate.	Standard.
169	Portoil du Poitou.	April.	Melting.	Middle.	Moderate.	Wall and Espalier.
170	Ramelier.	May. June.	Melting.	Large.	Moderate.	Standard.
171	Reine Caroline.	November.	Melting.	Large.	Very good.	Standard or Wall.
172	Robine.	August.	Melting.	Middle.	Good.	Standard.
173	Roi de Rome.	Dec. Jan.	Melting.	Middle.	Good.	Standard
174	Rousselet de Rheims.	September.	Melting.	Small.	Very good.	Standard.
175	Rousselet d'hiver.	Autumn.	Melting. Sugared,	Middle.	Good.	Wall and Espalier.
176	Royale d'été (variety of the Robine).	August.	Melting.	Small.	Good.	Standard.
177	——— d'hiver.	Winter.	Melting,	Large.	Moderate.	Standard.
178	Sanguine d'Italie.	April.	Crisp.	Large.	Moderate.	Wall and Espalier.
179	Sanguinole, or Poire de Vin.	August.	Crisp.	Middle.	Moderate.	Standard.
180	St. Bernard d'hiver.	Winter.	Melting. Sugared.	Large.	Good.	Wall, Esp. Stand.
181	St. Germain.	Nov. Dec.	Melting.	Large.	Good.	Wall.
182	St. Ghislain.	Sept. Oct.	Melting.	Middle.	Good.	Standard.
183	St. Laurent.	August.	Melting.	Middle.	Moderate.	Standard.
184	Sanspareille, or Poire de cent couronnes.	Autumn.	Melting. Sugared.	Middle.	Good.	Wall and Spiral.
185	Sartiere.	November.	Melting.	Large.	Good.	Standard.
186	Satin Vert.	Autumn.	Melting. Sugared.	Middle.	Good.	Wall, Esp. Stand.
187	Sept en Gueule.	August.	Melting.	Small.	Good.	Standard.
188	Soquette (la).	October.	Crisp.	Middle.	Good.	Standard.
189	Somelier de Claizon.	November.	Melting.	Middle.	Good.	Standard.
190	Sucre Rouge.	September.	Melting.	Middle.	Good.	Standard.
191	Sucre Vert.	November.	Melting.	Middle.	Good.	Standard.
192	Super Fondant.	November.	Melting.	Large.	Good.	Standard.
193	Urbaniste.	November.	Melting.	Large.	Very good.	Standard.
194	Vermillon d'été.	August.	Melting.	Middle.	Good.	Wall and Espalier.
195	Virgouleuse.	November.	Crisp.	Large.	Good.	Wall.
196	Volmerange.	Nov. Dec.	Melting.	Large.	Moderate.	Wall and Standard.
197	Yutte.	Autumn.	Melting.	Large.	Good.	Wall and Espalier.

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London: Printed by W. Nicol,
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1. The Royal Pearmain.
2. The Golden Harvey.
3. The White Easter Apple.
4. Luckomb's Seedling Apple.
5. The Red Ingestrie Apple.
6. The Burr-knot Apple.
7. The Embroidered Pippin.
8. The Lemon Pippin.
9. The Sack and Sugar Apple.
10. The French Crab.
11. The Red Astrachan Apple.
12. Kirke's Golden Pippin.
13. The Wyken Pippin.
14. The White Tartarian Cherry.
15. Morgan's Seedling Red Currant.
16. The Red Siberian Crab.
17. The Champagne Gooseberry.
18. The Catherine Peach.
19. The Marie Louise Pear.
20. The Napoleon Pear.
21. The White Damson.
22. The Pigeon's Heart Plum.
23. The Great Quetche Plum.
24. The Black Damson Plum.
25. The White Imperatrice Plum.

List of Medals *and* Rewards, *presented by* Order *of the* Council *of the* Horticultural Society *of* London, *from May* 1, 1822, *to May* 1, 1823.

May 8, 1822. To Mr. John Booth, Foreign Corresponding Member of the Society, Nurseryman, at Hamburgh, the Silver Medal, for his attention in sending presents of Fruit Trees, and Seeds of esculent Vegetables, for the Garden of the Society.

July 20, 1822. To William Leycester, Esq. of Calcutta, the Silver Medal, for his valuable present of Plants, Seeds, and specimens of Fruits preserved in spirits, sent by him to the Society from the Botanic Garden at Calcutta.

July 20, 1822. To Mr. Francis Place, the Silver Medal, for his valuable present of Seeds and Bulbs, imported from South America, to the Garden of the Society.

August 21, 1822. To his Excellency Sir Thomas Stamford Raffles, Lieutenant Governor of Bencoolen, Foreign Corresponding Member of the Society, the Silver Medal, for a large and interesting collection of Plants, especially of those of the Fruits of the Eastern Islands, Bulbs and Seeds, made by him to the Society.

August 21, 1822. To Mr. George Caley, Foreign Corresponding Member of the Society, Superintendant of the Botanic Garden at the Island of St. Vincent, the Silver Medal, for a valuable present of Tropical Plants made by him to the Society, as well as for various previous Communications.

October 9, 1822. To Thomas Beale, Esq. of Macao in China, the Silver Medal, for his attention to the interests of the Society, manifested in the assistance rendered by him to Mr. John Potts, a Botanical Collector in the service of the Society, during his stay in China in the years 1821 and 1822.

October 9, 1822. To Mr. J. H. BLATTERMANN, of the Dutch Factory at Canton, the Silver Medal, for his attention to the interests of the Society, manifested in the assistance rendered by him to Mr. JOHN POTTS, a Botanical Collector in the service of the the Society, during his stay in China in the years 1821 and 1822.

February 19, 1823. To Mr. CHARLES MATHURIN VILLET, Foreign Corresponding Member of the Society, the Silver Medal, for a fine collection of Bulbs and Seeds, sent by him to the Society from the Cape of Good Hope.

March 5, 1823. To the Rev. GEORGE SWAYNE, A. M. Corresponding Member of the Society, the Silver Medal, for his various Communications to the Society, several of which have been printed in the Transactions.

List of Persons to whom the BANKSIAN MEDAL *has been presented, by* ORDER *of the* COUNCIL *of the* HORTICULTURAL SOCIETY *of* LONDON, *for* EXHIBITIONS *at General Meetings of the Society, from May* 1, 1822, *to May* 1, 1823.

To Mr. JOHN WILMOT, F. H. S. for varieties of Strawberries, exhibited June 18, 1822.

To Mr. JAMES GRANGE, for varieties of Strawberries, exhibited June 18.

To Mr. MICHAEL KEENS, for varieties of Strawberries exhibited June 18.

To the Rev. THOMAS GARNIER, A. M. F. H. S. for varieties of Strawberries exhibited June 18.

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To CHARLES HOLFORD, Esq. F. H. S. for Melons, Pine Apple, and Peaches, exhibited July 16.

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To THOMAS DICKENS, Esq. F. H. S. for a Pine Apple and Grapes, exhibited July 16.

To Mr. STEPHEN KERSHAW, F. H. S. Gardener to DANIEL HENRY RUCKER, Esq. F. H. S. for Peaches and Nectarines, exhibited July 16.

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To Richard Vachell, Esq. for Florence Cherries, exhibited August 6.

To Roger Wilbraham, Esq. F. H. S. for Tripoli Onions, exhibited August 20.

To Mr. Thomas Jenkins, F. H. S. for Peaches and Nectarines, exhibited August 20.

To Mr. William Chartres, Gardener to The Lord Grantham, F. H. S. for Grapes, exhibited August 20.

To Mr. Robert Clews, F. H. S. Gardener to His Grace the Duke of Devonshire, F. H. S. for Peaches and Nectarines, exhibited August 20.

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To Peter Rainier, Esq. Capt. R. N. F. H. S. for various Fruits, exhibited September 3.

To Mr. Mark Robson, C. M. H. S. Gardener to Ralph Riddell, Esq. F. H. S. for Peaches and Nectarines, exhibited September 3.

To Charles Worthington, Esq. F. H. S. for various Fruits, exhibited September 17.

To Mr. George White, F. H. S. Gardener to Benjamin Benyon, Esq. M. P. F. H. S. for Grapes, exhibited September 17.

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Le Bon Jardinier Almanach pour l'Année 1821. 12mo. *Paris*, 1821.

——————————— pour l'Année 1822. 12mo. *Paris*, 1822.

LIST *of* DRAWINGS *of* FRUITS *executed by* ORDER *of the* COUNCIL *of the* HORTICULTURAL SOCIETY *of* LONDON, *between May* 1, 1821, *and May* 1, 1822.

1. The Blenheim Orange Apple.
2. The Early July Flower Apple.
3. The Turk's Cap Apple.
4. The Violet Apple.
5. Knight's Late Black Cherry.
6. The Spring Grove Chestnut.
7. The Pitmaston Sanguinole Peach.
8. The Seckle Pear.
9. The Vienna Plum.

The Council have to regret, that on account of the severe indisposition of Mr. HOOKER, the Artist employed by the Society, they have not been able to complete the usual number of Drawings of Fruits for the past year, the above being the whole which have been executed.

List of Medals *and* Rewards *presented by* Order *of the* Council *of the* Horticultural Society *of* London, *from May* 1, 1821, *to May* 1, 1822.

September 5th, 1821. To M. Augustin Pyrame De Candolle, Foreign Member of the Society, the Silver Medal, for his Memoir on the different species, races, and varieties of the Genus Brassica, and the Genera allied to it, which is printed in the Transactions.

September 5th, 1821. To Mr. William Buchan, Fellow of the Society, Gardener to the Lord Cawdor, at Stackpool Court, near Pembroke, the Silver Medal, for having produced a New Providence Pine, weighing 10lb. 8oz. which was exhibited at the Meeting of the Society on the 17th of July, and afterwards presented to His Majesty, and served at his table at the Coronation banquet.

September 5th, 1821. To Mr. John Read, of Horsemonden, near Lamberhurst, Kent, the Silver Medal, for his invention of an improved Garden Syringe, which has been exhibited to the Society.

November 8th, 1821. To Mr. John Cock, Gardener to Mrs. Jane Thoyts, at Sulhampstead House, near Reading, the Silver Medal, for having raised a Seedling Peach of great excellence, which has been named the Sulhampstead Peach.

November 8th, 1821. To Mr. Patrick Flanagan, Fellow of the Society, Gardener to Sir Thomas Hare, Bart. at Stow Hall, Norfolk, the Silver Medal, for his various communications and exhibitions of fine Fruit made to the Society.

November 8th, 1821. To Mr. Francis Hulbert, Gardener to the Lord Henry Fitzgerald, at Thames Ditton, the Silver Medal, for his zeal and attention in the cultivation of numerous

varieties of Flemish Pears, many specimens of which have, from time to time, been transmitted by him to the Society.

November 8th, 1821. To Mr. JOHN BARNARD, of Waltham Abbey, Three Pounds, for having raised the Waltham Abbey Seedling Apple, specimens of which had been exhibited to the Society, and Plants presented to the Garden.

December 19th, 1821. To the Rev. THOMAS GARNIER, A.M. Fellow of the Society, the Silver Medal, for his Paper on the Cultivation of Strawberries, which is printed in the Transactions.

December 19th, 1821. To JOHN TOWNSEND AITON, Esq. Fellow of the Society, the Silver Medal, for his Paper on Forcing Plums, which is printed in the Transactions.

December 19th, 1821. To Mr. GEORGE VOORHELM SCHNEEVOOGHT, Foreign Corresponding Member of the Society, the Silver Medal, for his attention in procuring specimens of the Pears and Apples of Holland, and for his Communications thereon.

January 18th, 1822. To CHARLES HOLFORD, Esq. Fellow of the Society, for his enterprise and skill in Horticultural pursuits, as evinced by the fine specimens of Forced, and other Fruits, which he has at different times exhibited at the Meetings of the Society.

February 6th, 1822. To Mr. MARTIN MILLER CALL, Foreign Corresponding Member of the Society, Gardener to his Majesty the EMPEROR OF RUSSIA, at the Taurida Palace, St. Petersburgh, the Silver Medal, for his numerous Communications and Presents of various productions of the Russian Gardens, made to the Society.

February 9th, 1822. To Mr. JOHN LINDLEY, Fellow of the Society, the Silver Medal, for his Paper on the principal Tropical Fruits which are likely to be worth cultivating in England (which is printed in the Transactions), that being one of the subjects for which Medals and Rewards were offered at the last Anniversary.

February 9th, 1822. To Rear-Admiral Robert Lambert, Fellow of the Society, the Silver Medal, for the services which he has rendered to the Society during the period of his command at St. Helena and the Cape of Good Hope.

February 25th, 1822. To Robert Hallett, Esq. Fellow of the Society, the Silver Medal, for his Paper on the Cultivation of Cranberries in dry beds, which is printed in the Transactions.

April 3rd, 1822. To Mr. James Backhouse, Corresponding Member of the Society, the Silver Medal, for his various presents made to the Garden of the Society.

April 26th, 1822. To Roger Wilbraham, Esq. Fellow of the Society, the Silver Medal, for the unremitting attention which he has paid to Horticulture, and for the many services rendered by him to the Society during the period in which he has acted as a Member of the Council, and a Vice President of the Society.

List of Persons to whom the BANKSIAN MEDAL *has been presented by* ORDER *of the* COUNCIL *of the* HORTICULTURAL SOCIETY *of* LONDON, *for* EXHIBITIONS *at General Meetings of the Society, from May* 1, 1821, *to May* 1, 1822.

To Mr. JAMES MEAN, F. H. S. Gardener to Sir ABRAHAM HUME, Bart. F. H. S. at Wormleybury, Hertfordshire, for flowers of Pæonia Moutan Papaveracea, exhibited May 8.

To Mr. JAMES JENNINGS, Gardener to JOSEPH SABINE, Esq. Sec. H. S. at North Mimms, Hertfordshire, for flowers of Pæonia Moutan Banksii, exhibited, May 16.

To Mr. PATRICK FLANAGAN, F. H. S. Gardener to Sir THOMAS HARE, Bart. F. H. S. at Stow Hall, Norfolk, for an early Cantaloup Melon, exhibited May 16.

To JOHN TOWNSEND AITON, Esq. F. H. S. for a collection of Seedling Ranunculuses, exhibited June 5.

To Mr. SAMUEL BROOKES, F. H. S. for a collection of Ranunculuses, exhibited June 19.

To Mr. THOMAS HOGG, for a collection of Pinks, exhibited July 3.

To the Rev. THOMAS GARNIER, F. H. S. for a collection of Strawberries, exhibited July 3.

To JOSEPH SABINE, Esq. Sec. H. S. for a collection of Roses, exhibited July 17.

To Mr. ISAAC OLDAKER, F. H. S. Gardener to Lady BANKS, at Spring Grove, for Cherries and Strawberries, exhibited July 17.

To ROGER WILBRAHAM, Esq. V. P. H. S. for specimens of Braddick's American Peach, ripened under Glass, exhibited July 17.

To CHARLES HOLFORD, Esq. F. H. S. for Strawberries, Grapes, and a Melon, exhibited July 17.

To Mr. Peter M'Arthur, C. M. H. S. Gardener to Alexander Baring, Esq. F. H. S. at the Grange, Hampshire, for Grapes and Pines, exhibited July 17.

To Mr. David Anderson, F. H. S. Gardener to the Lord Montagu at Ditton Park, near Windsor, for Grapes and other fruits exhibited August 7.

To Mr. John Wilmot, F. H. S. for Currants, and Grapes, exhibited August 7.

To Mr. Matthew Stevens, for Lancashire Gooseberries, exhibited August 7.

To Mr. Charles Berry, Gardener to James Alexander, Esq. at Somerhill, Kent, for an unusually large Melon, exhibited August 7.

To Mr. Thomas Ashworth, C. M. H. S. Gardener to The Lord Stewart, at Wynyard, Durham, for varieties of Grapes, exhibited August 7.

To Mr. Charles Spong, C. M. H. S. Gardener to Robert Gordon, Esq. M. P. F. H. S. at Leweston, Dorsetshire, for varieties of Grapes, exhibited August 7.

To Mr. Robert Clews, F. H. S. Gardener to The Duke of Devonshire, F. H. S. at Chiswick, for various Fruits, exhibited August 7.

To Mr. Thomas Moffatt, C. M. H. S. Gardener to The Lord Sydney, F. H. S. at Frognal, in Kent, for various Fruits, exhibited August, 21.

To John Williams, Esq. C. M. H. S. for his seedling Mignonne Peach, and Pitmaston Orange Nectarine, exhibited September 4.

To Mr. James Young, F. H. S. for a collection of Single and Double Dahlias, exhibited September 18.

To John Sudlow, Esq. F. H. S. for specimens of Braddick's American Peach, exhibited September 18.

To Mr. Henry Bailey, F. H. S. Gardener to The Earl Spencer, F. H. S. at Althorp, Northamptonshire, for Black Hamburgh Grapes, exhibited September 18.

To Richard Crawshay, Esq. F. H. S. for Muscat of Alexandria Grapes, exhibited September 18.

To William Greenshields, C. M. H. S. Gardener to Richard Powlett Wrighte Benyon, Esq. F. H. S. at Englefield House, near Reading, for a large Queen Pine, exhibited September 18.

To Frederick Garsham Carmichael, Esq. F. H. S. for various Fruits, exhibited October 2.

To M. Louis Claude Noisette, C. M. H. S. for a collection of Pears and Apples, exhibited October 2.

To Mr. Mark Robson, C. M. H. S. Gardener to Ralph Riddell, Esq. at Felton Hall, Northumberland, for varieties of Grapes, exhibited October 2.

To Mr. Hugh Ronalds, F. H. S. for a collection of Apples, exhibited October 2.

To Mr. Samuel Rintoul, Gardener to the Earl of Liverpool, F. H. S. at Walmer Castle, Kent, for Portugal Onions grown by him, exhibited October 16.

To John Elliot, Esq. V. P. H. S. for specimens of a large oval-berried Black Grape, exhibited October 16.

To Charles Welstead, Esq. F. H. S. for specimens of Grapes from the Valentine's Vine, exhibited October 16.

To Mr. James Smith, Gardener to James Hammond, Esq. at Potters Bar, Hertfordshire, for specimens of the Levant Melon, exhibited October 16.

To Mr. Samuel Knevett, F. H. S. for Red Antwerp Raspberries, exhibited October 16th, and at several previous meetings.

To Mr. Joseph Kirke, F. H. S. for a collection of Apples, exhibited October 16.

To Mr. William Buck, C. M.H.S. Gardener to the Hon. Fulke Greville Howard, F.H.S. at Elford, near Lichfield, for bearing Vines in pots, exhibited November 20.

To William Wells, Esq. F. H. S. for plants and flowers of Chinese Chrysanthemums, exhibited December 4.

To Richard Arkwright, Esq. F. H.S. for retarded Grapes, exhibited December 18.

To Michael Mucklow Zachary, Esq. F. H.S. for a collection of Apples, exhibited January 1, 1822.

To Mr. William Morgan, F. H. S. Gardener to Henry Browne, Esq. at North Mimms Place, Hertfordshire, for a collection of Apples, exhibited January 15.

To John Daniel Prescott, Esq. of St. Petersburgh, for specimens of Astrachan Grapes, exhibited February 5.

To Mr. William Bradbery, for cultivated Water Cresses, exhibited February 19.

To David Hosack, M. D. C. M. H. S. for specimens of varieties of Indian Corn, exhibited February 19.

To John Braddick, Esq. F. H. S. for a collection of Apples, exhibited February 19.

To Charles Hampden Turner, Esq. F. H. S. for a flowering plant of Glycine Sinensis, exhibited March 5.

To James Vere, Esq. F. H. S. for a flowering plant of Azalea Indica, exhibited March 5.

To John Motteux, Esq. F. H. S. for specimens of the Beachamwell Seedling Apple, exhibited March 19.

To Sir Charles Miles Lambert Monck, Bart. F. H. S. for Lemons grown in his conservatory, exhibited March 19.

CERTIFICATE,

IN LIEU OF THE BANKSIAN MEDAL.

It being deemed expedient that only One Banksian Medal shall be awarded to the same Person in the same year, and yet the Council being desirous of bestowing some mark of approbation on those Persons whose repeated Exhibitions are entitled to particular notice, have ordered, that an engraved Certificate be given to each Exhibitor, who may have received the Banksian Medal, for every succeeding Exhibition within the year, provided such Exhibition be of such importance as would have entitled the Exhibitor to receive the Medal.

List of the Persons to whom the CERTIFICATE, *in lieu of the* BANKSIAN MEDAL, *has been presented, by* ORDER *of the* COUNCIL *of the* HORTICULTURAL SOCIETY *of* LONDON, *for Exhibitions at General Meetings of the Society, from May* 1, 1821, *to May* 1, 1822.

To JOHN TOWNSEND AITON, Esq. F. H. S. for forced Green Gage and Orleans Plums, from His Majesty's Garden at Cumberland Lodge, exhibited July 3, 1821.

To Mr. THOMAS HOGG, for Flowers of Picotees and Carnations, from his Garden at Paddington, exhibited August 7, 1821.

To Mr. MATTHEW STEVENS, for a collection of Lancashire Gooseberries, from his Garden at Harefield, near Uxbridge, exhibited August 21, 1821.

To Mr. PETER MAC ARTHUR, C. M. H. S. Gardener to ALEXANDER BARING, Esq. F. H. S. for various Fruits, exhibited August 21, 1821.

To CHARLES HOLFORD, Esq. F. H. S. for various Fruits, from his Garden at Hampstead, exhibited September 4, 1821.

To Mr. ISAAC OLDAKER, F. H. S. for various Fruits from the Garden of LADY BANKS, at Spring Grove, exhibited September 4, 1821.

To Mr. PATRICK FLANAGAN, F. H. S. for an Antigua Pine, from the Garden of Sir THOMAS HARE, Bart, F. H. S. exhibited September 4, 1821.

To Mr. ROBERT CLEWS, F. H. S. Gardener to the Duke of DEVONSHIRE, F. H. S. at Chiswick, for various Fruits, exhibited September 18, 1821.

To JOHN WILLIAMS, Esq. C. M. H. S. for specimens of two Seedling Peaches, raised in his Garden, exhibited October 2, 1821.

To Mr. Patrick Flanagan, F. H. S. for a collection of Apples and Pears, from the Garden of Sir Thomas Hare, Bart. F. H. S. exhibited October 16, 1821.

To Mr. David Anderson, F. H. S. Gardener to the Lord Montagu, at Ditton Park, near Windsor, for a collection of Pears and Apples, exhibited November 6, 1821.

To Mr. Joseph Kirke, F. H. S. for a collection of Apples, exhibited December 4, 1821.

To Mons. Louis Claude Noisette, C. M. H. S. for a collection of Pears and Apples, exhibited December 18, 1821.

LIST OF BOOKS AND OTHER ARTICLES,

PRESENTED TO THE

LIBRARY OF THE SOCIETY,

FROM MAY 1, 1819, TO MAY 1, 1822.

WITH THE NAMES OF THE DONORS.

ROBERT ADAMS, Esq. F. H. S.

Naismith's Elements of Agriculture, 8vo. *London*, 1807.

Lyon's Treatise on the Physiology and Pathology of Trees, 2d edit. 8vo. *Edinburgh*, 1816.

Rev. CHARLES ANNESLEY, F. H. S.

Suter (Johan Rudolf,) Flora Helvetica, 2 tom. 12mo. *Tur*. 1802.

ROBERT BARCLAY, Esq. F. H. S.

Curtis's Monograph of the Genus Camellia, large folio, *London*, 1821.

MR. FRANCIS BREDEMEYER, C. M. H. S.

A Drawing of the "Archduke Anthony's Rose."

SENHOR FELIX AVELLAR BROTERO, F. M. H. S.

Brotero, Flora Lusitanica, Pars 1 et 2, 8vo. *Olissipone*, 1804.

——— Phytographia Lusitanica, tom. 1, folio, *ib*. 1816.

CALEDONIAN HORTICULTURAL SOCIETY.

Memoirs of the Caledonian Horticultural Society, No. 10, *Edinburgh*, 1821.

A Discourse read at the Annual Election Meeting of the Caledonian Horticultural Society, December, 1821, 8vo.
Edinburgh, 1822.

MR. HENRY CRACE, F. H. S.

Catalogue of Roses cultivated at Calvert and Co's. Nursery, Bonne Nouvelle, Rouen. *Rouen*, 8vo. 1821.

SIR HUMPHRY DAVY, BART. P. R. S. &c.

HONORARY MEMBER OF THE HORTICULTURAL SOCIETY.

Davy's Elements of Agricultural Chemistry, 3d. edit. 8vo.
London, 1821.

M. AUGUSTIN PYRAMUS DE CANDOLLE, F. M. H. S.

De Candolle, Essai Elémentaire de Géographie Botanique, 8vo.

——————— Catalogue des Arbres fruitiers du Jardin Botanique de Genève, 8vo. *Genève*.

——————— Mémoire sur la Famille de Crucifères, 4to.

AUGUSTUS FRIEDRICH ADRIAN DIEL, M. D. C. M. H. S.

Diel (Aug. Fried. Adr.) Systematische Beschreibung der vorzüglichsten in Deutschland vorhandenen Kernobstsorten, vol. 1, 12mo. *Stuttgart*, 1821.

WILLIAM FARR, ESQ.

Farr, (W.) An Essay on the Effects of the Fucus Helminthocorton upon Cancer, 8vo. *London*, 1822.

M. CHARLES ROMAIN FEBURIER, C. M. H. S.

Feburier (C. R.) Observations sur le Systême Physiologique de M. Aubert du Petit-Thouars, 8vo.

——————— Rapport sur les Moyens proposés jusqu'à ce jour pour préserver les Blés de la Carie, 8vo.

THE GEOLOGICAL SOCIETY.

Transactions of the Geological Society, Vols. I. to V. inclusive, 4to.
London, 1811-21.

MR. JOHN HARDING.

Maddock's Florist's Directory, a new edition, by S. Curtis, 8vo.
London, 1822.

RICHARD N. HARRISON, Esq.

Memoirs of the Board of Agriculture of the State of New York, Vol. I. *Albany*, 1821.

ADRIAN HARDY HAWORTH, Esq. F. H. S.

Haworth, Saxifragearum Enumeratio, 8vo. *London*, 1821.

THE Hon. and Rev. WILLIAM HERBERT, F. H. S.

Herbert, Appendix to the Botanical Register and Botanical Magazine. 8vo. *London*, 1821.

SIR RICHARD COLT HOARE, Bart.

A List of Geraniums in the Conservatories of Sir Richard Colt Hoare, Bart. at Stourhead, Co. Wilts, A. D. 1821. 4to.

MR. THOMAS HOGG.

Hogg's Catalogue of Carnations, Piccatees, &c. 12mo. *London*, 1822.

REV. PETER FRY HONY, F.H.S.

Seguier, Plantæ Veronenses, 2 tom. 8vo. *Veronæ*, 1745.
Geoponicorum sive de Re Rustica libri xx. curâ Niclas, 4 tom. in 2. 8vo. *Lipsiæ*, 1781.

WILLIAM HOOKER, Esq. F. H. S.

Ferrarii Hesperides sive de Malorum Aureorum Cultura et Usu, libri quatuor. fol. *Romæ*, 1646.
Cause, De Koninglyke Hovenier, folio. *Amst*.

MR. JOHN WILLIAM HORNEMAN, F. M. H. S.

A Drawing of the Gravenstein Apple.

DAVID HOSACK, M. D. F. M. H. S.

A Drawing of the Washington Plum.

THE BARON JOSEPH FRANCIS JACQUIN, F. M. H. S.

A Drawing of Passiflora incarnata.

CUTHBERT WILLIAM JOHNSON, Esq.

An Essay on the Uses of Salt for Agricultural Purposes and in Horticulture. 2d Ed. 8vo. *London*, 1821.

AYLMER BOURKE LAMBERT, Esq. F. H. S.

An Illustration of the Genus Cinchona. 4to. *London*, 1821.

MR. PETER LINDEGAARD, C. M. H. S.

A Drawing of the Montagne Peach.
A Painting in oil of the Melon d'Ananas, or Pine Melon.

MR. JOHN LINDLEY, F. H. S.

Nestler, Monographia de Potentilla, 4to. *Par. et Argent.* 1816.
De Candolle, Icones Plantarum Galliæ rariorum, Fasc. 1. 4to. *Paris*, 1808.
——————— Catalogus Plantarum Horti Botanici Monspeliensis, 8vo. *Monsp.* 1813.
Hermanni Hortus Lugduno-Batavus, 8vo. *Lugd. Bat.* 1687.
Plinii Historia Naturalis, 3 vol. 18mo. *Lugd. Bat.* 1635.
Rapini Hortorum libri, Eclogæ, liber de Carmine Pastorali, Odæ, 18mo. *Ludg. Bat.* 1672.
Scheuchzeri Itinera Alpina, 4to. *Londini*, 1708.
Du Petit-Thouars, Mélanges de Botanique et de Voyages. 1re Recueil, 8vo. *Paris*, 1811.
Neesii ab Esenbeck, Horæ Physicæ Berolinenses, fol. *Bonn.* 1820.
Trinius, Fundamenta Agrostographiæ, 8vo. *Wien.* 1820.
Besser, Primitiæ Floræ Galiciæ Austriacæ Utriusque. Pars 1 & 2. 12mo. *Wien.* 1809.
Weihe et Neesii ab Esenbeck, Rubi Germanici. Fasc. 1 et 2. fol. *Bonn*, 1822.

THE LINNEAN SOCIETY.

Transactions of the Linnean Society, Vol. XIII. Part I. 4to. *London*, 1821

MESSRS. LODDIGES AND SONS.

Loddiges's Botanical Cabinet, Part 49 to 60, inclusive. 8vo. *London*, 1821-2.

MR. JOHN CLAUDIUS LOUDON, F. H. S.

Outline of a General History of Gardening. 8vo. *London*, 1821.

SOCIÉTÉ D'AGRICULTURE ET DE BOTANIQUE DE LOUVAIN.

Exposition d'Été 1821 de la Société d'Agriculture et de Botanique de Louvain. 8vo. *Louvain*.

M. LOUIS CLAUDE NOISETTE, C. M. H. S.

Le Bon Jardinier Almanach pour l'année 1821, 12mo. *Paris*, 1821.

Le Jardin Fruitier, liv. 10 à 15, 4to. *Paris*, 1821.

M. FREDERIC OTTO, C. M. H. S.

Link et Otto, Enumeratio Plantarum Horti Regii Botanici Berolinensis. Pars 1. *Berol.* 1821.

Icones Plantarum Selectarum Horti Regii Botanici Berolinensis, Fasc. 3.

MR. HENRY PHILLIPS, F. H. S.

History of Cultivated Vegetables, 2 vol. 8vo. *London*, 1822.

SIG. JEAN FRANÇOIS PIOTAZ, C. M. H. S.

Catalogus Stirpium quæ aluntur in Regio Horto Botanico Taurinensi, 8vo. *Taurin.* 1821.

M. PHILIPPE AUGUSTE JOSEPH MAIRETTE DE PRONVILLE, C. M. H. S.

Pronville sur l'État actuel de l'Agriculture en France, 8vo. 1819.

Pronville, Nomenclature raisonnée des espèces, variétés, et sous-variétés du Genre Rosier, 8vo. *Paris*, 1818

EDWARD RIGBY, M. D. F. H. S.

Framingham, its Agriculture, &c. 8vo. *Norwich*, 1820.

Chateauvieux's Italy, its Agriculture, &c. translated by Rigby, 8vo. *Norwich*, 1819.

THE MANAGERS OF THE ROYAL INSTITUTION.

The Journal of Science and the Arts, Nos. 22, 23, 24, 25, 8vo. *London*, 1821-2.

THE ROYAL SOCIETY.

Philosophical Transactions of the Royal Society of London for the year 1821, Parts 1 and 2, 4to. *London*, 1821.

JOSEPH SABINE, Esq. F. R. S. &c. Secretary.

Schleicher, Catalogus hucusque absolutus omnium Plantarum in Helvetia cis et transalpina sponte nascentium, ed. tertia, 8vo. 1815.

Catalogue des Arbres, Arbustes, et autres Plantes, cultivés dans l'Etablissement de F. Cels. 8vo. *Paris*, 1817.

Catalogue du Jardin des Plantes de S. E. Mons. le Comte Aléxis de Razoumoffsky, 12mo. 1808.

An Account of the different Gooseberry Shews held in Lancashire, Cheshire, &c. in the year 1816, 12mo. *Manchester*.

SIG. GAETANO SAVI, C. M. H. S.

Savi, Memoria sopra una Pianta cucurbitacea, 8vo. *Milano*, 1818.

—— Sul Cedro del Libano, 8vo. *Firenze*, 1818.

—— Sulla Magnolia grandiflora e sulla Magnolia acuminata, 8vo.

MR. GEORGE VOORHELM SCHNEEVOOGHT, C. M. H. S.

Serrurier Fruitkundig Woordenboek, 2 vol. *Amst.* 1805-6.

REV. ALEXANDER JOHN SCOTT, D. D. F. H. S.

Lochneri Nerium sive Rhododaphne, 4to. *Norimb.* 1716.

———— Commentatio de Ananasa, 4to.

—— —— Schediasma de Parreira Brava, 4to. *Norimb.* 1719.

MR. TRAUGOTT SEIDEL, C. M. H. S.

Hülfsblætter zum Studium der Botanik. Lief. 1 & 2, 8vo. *Dresden*, 1821.

SIR JAMES EDWARD SMITH, P. L. S.

HONORARY MEMBER OF THE HORTICULTURAL SOCIETY.

Correspondence of Linnæus, and other Naturalists, 2 vol. 8vo. *London*, 1821.

M. CLAUDE ANTOINE THORY, C. M. H. S.

Thory, Rosa Candolleana seu descriptio novæ Speciei Generis Rosæ, dicata Pyr. Aug. De Candolle, 8vo. *Paris*, 1819.

——. Rosa Redutea, descriptio novæ Speeiei Generis Rosæ dicata Petro Josepho Redouté, 8vo. *Paris*, 1817.

—— Bibliotheca Botanica Rosarum, folio, *Paris*, 1818.

—— Prodrome de la Monographie du Genre Rosier, 12mo. *Paris*, 1820.

JEAN BAPTISTE VAN MONS, M. D. F. M. H. S.

Annales Générales des Sciences Physiques, Liv. 8. 8vo. *Bruxelles*, 1821.

M. J. P. VIBERT.

Vibert, Observations sur la Nomenclature et le Classement des Roses, 8vo. *Paris*, 1820.

List *of* Drawings *of* Fruits, *executed by* Order *of the* Council, *between May* 1, 1823, *and May* 1, 1824.

1. Bell's Scarlet Apple.
2. The Minshull Crab.
3. The Norfolk Beaufin.
4. The Wellington Apple.*
5. The Late Admirable Peach.
6. The Double Swalsh Peach.
7. The Old Newington Peach.
8. The Teton de Venus Peach.
9. The Vanguard Peach.

* The proper name of this Apple, which has now become common in the neighbourhood of London, is, Dummelow's Seedling, so named from a Nurseryman near Derby, by whom it was raised.

List of Medals *and* Rewards, *presented by* Order *of the* Council *of the* Horticultural Society *of* London, *from May* 1, 1823, *to May* 1, 1824.

June 24, 1823. To James Cowan, Esq. (late of Lima, in South America) the Silver Medal, for his attention to the objects of the Society, in sending a Collection of Seeds, and Bulbs from Peru.

July 14, 1823. To Mr. George Washington Jones, the Silver Medal, for having first introduced into this Country Plants of the Aracacha from South America, and for presenting the same to the Society.

Sept. 3, 1823. To E. N. Bancroft, M. D. of the Island of Jamaica, the Silver Medal, for his attention to the Society, in sending Plants of the Aracacha.

Sept. 3, 1823. To Mr. Peter M'Arthur, Corresponding Member of the Society, the Silver Medal, for his skill in the general Cultivation of Fruits as evinced by the Specimens of various kinds exhibited by him at the Meetings of the Society on the 5th and 19th of August.

Sept. 3, 1823. To William Atkinson, Esq. F. H. S. the Silver Medal, for having raised the new variety of Strawberry, called the Grove End Scarlet.

Nov. 5. 1823. To William Wells, Esq. F. H. S. the Silver Medal for his attention to Horticulture in general, and particularly for his success in raising new varieties of Double, Semi-double, and Single Dahlias.

Nov. 8, 1823. To Frederick Garsham Carmichael, Esq. F. H. S. the Silver Medal, for his attention to, and skill in Horticulture, as evinced by the Specimens of Fruits shewn by him at various Metings of the Society.

Nov. 17, 1823. To Mr. Robert Buck, C. M. H. S. the Silver Medal, for his skill in the Cultivation of the Pine-Apple, as evinced by the numerous Seedling varieties shewn by him at Meetings of the Society.

Feb. 16. To Signor Antonio Piccioli, C. M. H. S. the Silver Medal, as an acknowledgment of his attention and liberality to the Society, in presenting to it a large Collection of Models of the Fruits of Tuscany.

March 3. To Mr. Charles Harrison, F. H. S. the Silver Medal, for the ability shewn by him in the composition of his recently published Work on Fruit Trees.

April 3. To Mr. William Buck, C. M. H. S. the Silver Medal, for the production and dissemination of the very superior variety of Garden Rhubarb, called Buck's Rhubarb.

LIST *of* PERSONS *to whom the* BANKSIAN MEDAL *has been presented, by* ORDER *of the* COUNCIL *of the* HORTICULTURAL SOCIETY *of* LONDON, *for* EXHIBITIONS *at* GENERAL MEETINGS *of the* SOCIETY, *from May* 1, 1823, *to May* 1, 1824.

To THOMAS NETHERTON PARKER, Esq. for Sweeny Nonpareils, exhibited May 6, 1823.

To the Rev. PHILIP DOUGLAS, A. M. F. H. S. for a Collection of Apples, exhibited May 6, 1823.

To Mr. GEORGE LODDIGES, F. H. S. for ripe Fruit of the Plantain, exhibited June 3, 1823.

To Mr. JOSEPH KNIGHT, F. H. S. for a flowering Plant of Lilium longiflorum, exhibited June 3, 1823.

To Mr. Samuel Brookes, F. H. S. for a large Collection of Ranunculuses, exhibited June 17, 1823.

To Mr. THOMAS HOGG, for a large Collection of Ranunculuses, exhibited June 17, 1823.

To Mr. GEORGE CALEY, C. M. H. S. late of the Island of St. Vincent, for Specimens of the principal varieties of the Sugar Cane, cultivated in the West-Indies, exhibited July 1, 1823.

To the Rev. THOMAS GARNIER, F. H. S. for Strawberries, exhibited July 1, 1823.

To Mr. MICHAEL KEENS, for Strawberries, exhibited July 1, 1823.

To Mr. JOHN WILMOT, F. H. S. for Strawberries, exhibited July 1, 1823.

To Mr. JOHN NAIRN, F. H. S. Gardener to THOMAS FORBES REYNOLDS, Esq. F. H. S. at Hackbridge, Surrey, for Seedling Scarlet Strawberries, exhibited August 21, 1823.

To Mr. PATRICK FLANAGAN, F. H. S. Gardener to Sir THOMAS HARE, Bart. F. H. S. at Stow Hall, Norfolk, for various Fruits; exhibited August 5, 1823.

To Mr. JAMES LEE, F. H. S. for a large Collection of Roses; exhibited August 5, 1823.

To Henry Baring, Esq. F. H. S. for Grapes and Peaches, exhibited August 5, 1823.

To George Caswall, Esq. F. H. S. for Peaches, exhibited August 5, 1823.

To Mr. William Griffin, Gardener to Samuel Smith, Esq. F. H. S. at Woodhall Park, Hertfordshire, for Melons and Grapes, exhibited August 5, 1823.

To Mr. Edward Gardner, Jun. C. M. H. S. Gardener to John Harvey Thursby, Esq. at Abbington Abbey, Northamptonshire, for Melons and Grapes, exhibited August 5, 1823.

To the Rev. Thomas Coney, A. M. F. H. S. for Grapes, exhibited August 5, 1823.

To Mr. George White, F. H. S. Gardener to Benjamin Benyon, Esq. F. H. S. at Houghton Hall, Shropshire, for Grapes, exhibited August 19, 1823.

To Mr. Mark Robson, C. M. H. S. Gardener to Ralph Riddell, Esq. F. H. S. at Felton Hall, Northumberland, for Grapes, exhibited August 19, 1823.

To Joseph Brookhouse, Esq. for Grapes and Peaches, exhibited August 19, 1823.

To Mr. Isaac Andrews, F. H. S. for Grapes, exhibited August 19, 1823.

To Mr. Robert Clews, F. H. S. Gardener to the Duke of Devonshire, F. H. S. at Chiswick, for various Fruits, exhibited September 2, 1823.

To Mr. Isaac Oldaker, F. H. S. Gardener to Lady Banks, at Spring Grove, for various Fruits, exhibited September 2, 1823.

To Philip Hurd, Esq. F. H. S. for various Fruits, exhibited September, 16, 1823.

To Mr. William Greenshields, C. M. H. S. Gardener to Richard Benyon De Beauvoir, Esq. F. H. S. at Englefield House, Berkshire, for various Fruits, exhibited September 16, 1823.

To Mr. Thomas Moffatt, C. M. H. S. Gardener to the Viscount Sydney, F. H. S. at Frognal, Kent, for various Fruits, exhibited September 16, 1823.

To Richard Crawshay, Esq. F. H. S. for Grapes, exhibited September 16, 1823.

To Capt. Peter Rainier, R. N. F. H. S. for various Fruits, exhibited September 16, 1823.

To Mr. Hugh Ronalds, F. H. S. for various Fruits, exhibited September, 16, 1823.

To Mr. Henry Burn, C. M. H.S. Gardener to the Marquess of Ailesbury, F. H. S. at Tottenham Park, Wiltshire, for Peaches and Nectarines exhibited September 16, 1823.

To M. Louis Claude Noisette, C. M. H. S. for various French Fruits, exhibited September 16, 1823.

To Mr. Peter Walsh, Gardener to the Earl of Plymouth, at Hewell Grange, Worcestershire, for a New Providence Pine Apple, weighing 7lb. 14oz., exhibited October 7, 1823.

To Mr. John George Fuller, F. H. S. for a Collection of Apples, exhibited October 7, 1823.

To Edmund Tattersall, Esq. F. H. S. for Grapes, exhibited October 21, 1823.

To the Viscount Palmerston, F. H. S. for varieties of Peaches and Pears, exhibited October 21, 1823.

To Mr. Thomas Gibbs, F. H. S. for a Collection of Apples, exhibited November 5, 1823.

To the Crown Prince of Denmark, for Gravenstein Apples sent to the Meeting, on November 18, 1823.

To Mr. Stephen Jeeves, F. H. S. Gardener to the Lord Dacre, F. H. S. at the Hoo, Hertfordshire, for Brussels Sprouts, exhibited February 3, 1824.

To Lady Long, for a Flowering Plant of Primula Sinensis, exhibited March 3, 1824.

To Mr. William Ross, F. H. S. for a Seedling Camellia, exhibited March 16, 1824.

To Messrs. Chandler and Buckingham, for Seedling Camellias, exhibited March 15, 1824.

LIST *of* PERSONS *to whom the* CERTIFICATE, *in lieu of the* BANKSIAN MEDAL, *has been presented, by* ORDER *of the* COUNCIL *of the* HORTICULTURAL SOCIETY *of* LONDON, *for* EXHIBITIONS *at* GENERAL MEETINGS *of the* SOCIETY, *from May* 1, 1823, *to May* 1, 1824.

To Mr. THOMAS HOGG, for Carnations and Piccotees, exhibited August 5, 1823.

To Mr. HUGH RONALDS, F. H. S. for a Collection of Apples, exhibited October 7, 1823.

To M. LOUIS CLAUDE NOISETTE, C. M. H. S. for a large Collection of French Fruits, exhibited November 4, 1823.

To PHILIP HURD, Esq. F. H. S. for various Fruits, exhibited November 4, 1823.

To M. LOUIS CLAUDE NOISETTE, C. M. H. S. for various French Fruits, exhibited, November 18, 1823.

To RICHARD CRAWSHAY, Esq. F. H. S. for Grapes, exhibited December 2, 1823.

To Mr. ISAAC OLDAKER, F. H. S. for various Fruits, exhibited December 16, 1823.

To Mr. SAMUEL BROOKES, F. H. S. for a Flowering Plant of Azalea Indica, with double purple Flowers, exhibited March 16, 1824.

To the Same, for a Flowering Plant of Azalea Indica, with white Flowers, exhibited April 6, 1824.

To Mr. GEORGE WHITE, F. H. S. for a Black Jamaica Pine Apple, exhibited April 20, 1824.

LIST OF BOOKS, AND OTHER ARTICLES,

PRESENTED TO THE

LIBRARY OF THE SOCIETY,

FROM MAY 1, 1823, TO MAY 1, 1824.

WITH THE NAMES OF THE DONORS.

ROBERT ADAMS, ESQ. F. H. S.

Observations on Modern Gardening. 8vo. *London*, 1770.

M. URBAIN AUDIBERT, C. M. H. S.

Catalogue des Arbres, &c. cultivés dans les Pépinières des Frères Audibert à Tonelle, près Tarascon, 8vo. *Avignon*, 1822.

ROBERT BARCLAY, ESQ. F. H. S.

A Coloured Engraving of Quisqualis Indica.
A Coloured Engraving of Combretum purpureum.

EDWARD BARNARD, ESQ. F. H. S. Vice Secretary.

Sterler, Hortus Nymphenburgensis. 8vo. *Monachii*, 1821.

Mr. WILLIAM BEATTIE, C. M. H. S.

A Drawing of Rosa Brownii.

THE DUKE OF BEDFORD, F. H. S.

Hortus Gramineus Woburnensis; or an Account of the results of experiments on the produce and nutritive qualities of different Grasses and other Plants used as the food of the more valuable Domestic Animals; instituted by John Duke of Bedford. Illustrated with dried Specimens of the Plants. By George Sinclair. folio. *London*, 1816.

N. B. This volume was omitted in the List of Books presented in the year 1822.

JESSE BUEL, ESQ.

Memoirs of the Board of Agriculture of the State of New York, 2 vol. 8vo. *Albany*, 1821-3.

A Treatise on Agriculture. By a Practical Farmer. 8vo. *Albany*.

Address delivered on the Third Anniversary of the Albany County Agricultural Society. 8vo. 1821.

Albany County Agricultural Tracts, No. II. 8vo. 1823.

SIR HENRY EDWARD BUNBURY, Bart. F. H. S.

The Compleat Gardener's Practice. By Stephen Blake. 4to. *London*, 1664.

New Improvements of Planting and Gardening. By Richard Bradley. 8vo *London*, 1709.

Laurembergii Apparatus Plantarius Primus. 4to. *Francof.* 1632. Horticultura, Libris II. comprehensa. 4to. *Francof.* (1631.)

Ichnographia Rustica, or the Nobleman, Gentleman, and Gardener's Recreation. By Stephen Switzer, 3 vol. 8vo. *London*, 1718.

The Practical Kitchen Gardener. By Stephen Switzer. 8vo. *London*, 1727.

The Practical Fruit Gardener. By Stephen Switzer. 8vo. *London*, 1724.

The Nobleman, Gentleman, and Gardener's Recreation. By Stephen Switzer. And the Clergy-Man's Recreation. By John Lawrence. 8vo. *London*, 1715.

The Complete Gardener. By M. de la Quintinye; translated by George London and Henry Wise. 8vo. *London*, 1717.

The Retired Gardener, in Six Parts. By Joseph Carpenter, second edition. 8vo. *London*, 1717.

Curiositez de la Nature et de l'Art sur la Végétation ; ou l'Agriculture et le Jardinage dans leur Perfection. Par M. l'Abbé de Vallemont, 2 tom. 12mo. *Bruxelles*, 1715.

The History of the Propagation and Improvement of Vegetables. By Robert Sharrock, 12mo. *London*, 1660.

La Manière de cultiver les Arbres Fruitiers. Par le Sr Le Gendre. 12mo. Paris, 1784.

L'Art de Tailler les Arbres Fruitiers. 12mo. *Paris*, 1683.

Rapin, Hortorum Libri IV. 12mo. *Paris*. Ed. alt.

Traité de la Manière de semer toutes sortes de Graines. 12mo. *Paris*, 1689.

Instructions pour les Arbres Fruitiers. 12mo. *Paris*, 1676.

Nouveau Traité des Oeillets. 12mo. *Paris*, 1676.

THE CALEDONIAN HORTICULTURAL SOCIETY.

Memoirs of the Caledonian Horticultural Society, Part 11. 8vo. *Edinburgh*, 1823.

Messrs. CHANDLER and BUCKINGHAM.

Nauwkeurige Beschryving der Aard-Gewassen, door Abraham Munting. fol. *Utrect & Leiden*, 1697.

THOMAS CHEVALIER, ESQ. F. H. S.

Lectures on the General Structure of the Human Body. By Thomas Chevalier, F. R. S. &c. 8vo. London, 1823.

The Hunterian Oration delivered before the Royal College of Surgeons on the 14th February, 1821. By Thomas Chevalier, F. R. S. &c. 8vo. *London*, 1823.

DE WITT CLINTON, ESQ. F. M. H. S.

Memoirs of the Board of Agriculture of the State of New York, 2 vol. 8vo. *Albany*, 1821-3.

Transactions of the Society for the promotion of Agriculture, Arts, and Manufactures, instituted in the State of New York, 3 vol. 8vo. *Albany*, 1801-14.

Mr. JAMES COLVILL, F. H. S.

A Catalogue of Plants sold by James Colvill, Nursery and Seedsman, King's Road, Chelsea. 12mo. *London*, 1823.

M. CORNELISSEN.

Exposition d'Eté de la Société Royale d'Agriculture et de Botanique de Gand ; Juin et Juillet, 1821. 8vo. *Gand*, 1821.

THOMAS COULTER, M. D.

Mémoire sur les Dipsacées. Par Thomas Coulter, M. D. 4to. *Genève*, 1823.

WILLIAM COXE, ESQ. F. M. H. S.

A Drawing of the Washington Pear.

Mr. THOMAS DAVEY.

A Catalogue of all the best sorts of Flowers sold by Thomas Davey, King's Road, Chelsea. 12mo. *London*, 1823-4.

M. AUGUSTIN PYRAMUS DE CANDOLLE, F. M. H. S.

Mémoire sur la Famille de Ternstrœmiacèes. Par M. De Candolle. 4to. *Genève*, 1823.

Rapport sur les Plantes rares ou nouvelles qui ont fleuri dans le Jardin de Botanique de Genève. Par M. De Candolle. 4to. *Genève*, 1823.

Notice abrégée sur l'Histoire et l'Administration des Jardins Botaniques. 8vo. *Strasbourg*.

M. JEAN BAPTISTE GODEFROI DELBECQ, C. M. H. S.

Messager des Sciences et des Arts, Recueil publié par la Société Royale des Beaux Arts et des Lettres et par celle d'Agriculture et Botanique de Gand. 4 Numbers. 8vo. *Gand*, 1823.

Exposition publique (le xxixme) de la Société Royale d'Agriculture et de Botanique de la Ville de Gand. 8vo. *Gand*, 1823.

Discours prononcé à la distribution solennelle des Prix de la Société Royale d'Agriculture et de Botanique de Gand. Par M. Van Hulthem. 8vo. *Gand*, 1823.

Programme des Prix proposés par la Société Royale d'Agriculture et de Botanique de la Ville de Gand. 8vo. *Gand,* 1823.

MRS. M. DICKSON.

An Account of British Horticulture, drawn up for the Edinburgh Encyclopedia. By P. Niell, F. R. S. Ed. and F. L. S. 4to. *Edinburgh,* 1817.

AUGUSTUS FREDERICK ADRIAN DIEL, M. D. C. M. H. S.

Systematische Beschreibung der Vorzüglichsten in Deutschland vorhandenen Kernobstsorten, von Dr. Aug. Friedr. Adr. Diel. vol. 2. 12mo. *Stuttgart,* 1823.

M. DRAPIEZ.

Troisième Exposition Publique de la Société de Flore à Bruxelles. 8vo. 1823.

ANDREW DUNCAN, Sen. M. D. C. M. H. S.

Discourse read at the Annual Election Meeting of the Caledonian Horticultural Society, December 4, 1823. 8vo.

FREDERICK ERNEST LEWIS FISCHER, M.D. F.M.H.S.

Genera Plantarum duo. à F. E. L. Fischer. 4to.

MR. MICHAEL FLOY.

A Drawing of the Early New York Lemon Clingstone Peach.
A Drawing of the Early Sweet-water Peach.
A Drawing of a Free-stone Peach.
A Drawing of a Fall Apple.

WILLIAM FORSYTH, ESQ. F. H. S.

A Treatise on the Culture and Management of Fruit Trees. By W. Forsyth. Seventh edition. 8vo. *London,* 1824.

SIG. GIOVANNI GUSSONI, C. M. H. S.

Catalogus Plantarum quæ asservantur in Regio Horto in Boccadifalco. 8vo. *Neapoli,* 1821.

MR. CHARLES HARRISON, F. H. S.

A Treatise on the Culture and Management of Fruit Trees. By Charles Harrison, F. H. S. 8vo. *London*, 1823.

REV. GEORGE CHARLES LEWIS HEMPEL, C. M. H. S.

Sistematisches Verzeichniss aller in den Baumschulen der Podiebrader Dechanter kultivirten Obstsorten. Von Mathias Rössler. 8vo. *Platz*. 1798.

ALEXANDER HENDERSON, M. D. F. H. S.

The History of Ancient and Modern Wines. By Alexander Henderson. 4to. *London*, 1824.

MR. NATHANIEL SHIRLEY HODSON, C. M. H. S.

A Catalogue of Hardy Trees, Shrubs, and Herbaceous Plants, in the Botanic Garden at Bury St. Edmund's. 8vo. *Bury St. Edmund's*, 1822.

REV. PETER FRYE HONY, LL. D. F. H. S.

Traité raisonné des Arbres Fruitiers. Par Toussaint-Yves Catros. 12mo. *Bordeaux*, 1810.

Flore Bordelaise. Par J. F. Laterrade, 2nde edition. 12mo. *Bordeaux*, 1821.

Catalogue des Arbres, Arbrisseaux et Plantes cultivés dans les Pépinières de Catros et Gerand à Bordeaux. 8vo.

DAVID HOSACK, M. D. F. M. H. S.

The American Farmer, Vol. 4. 4to. *Baltimore*, 1823.

A Drawing of the Pomegranate Melon.

A Drawing of a Striped Pear.

PHILIP HURD, ESQ. F. H. S.

The Complete Forcing Gardener. By John Abercrombie. 12mo. *London*, 1781.

The Commemoration of Handel. By John Ring. Second edition. 8vo. *London*, 1819.

A Translation of the Works of Virgil, partly original, and partly altered from Dryden and Pitt. By John Ring, 2 vol. 8vo. *London*, 1820.

M. J. KOPS.

Index Plantarum quæ in Horto Rheno-Trajectino coluntur Anno 1822. 8vo. *Traj. ad Rhenum*, 1823.

MR. PETER LINDEGAARD, C. M. H. S.

Two Drawings of Grapes.

MR. JOHN LINDLEY, Garden Assistant Secretary.

Humboldt et Bonpland Nova Genera et Species Plantarum à Kunth. Fasc. xiii. et xiv. 4to. *Paris*.

THE LINNEAN SOCIETY.

The Transactions of the Linnean Society, Vol. xiv. Part 1. 4to. *London*, 1823.

JOHN LOWELL, ESQ. C. M. H. S.

The Massachusetts Agricultural Repository and Journal, No. 2 of vol. 5, No. 2 of vol. 6, and No. 4 of vol. 7. 8vo. 1818-23.

MESSRS. LODDIGES AND SONS.

The Botanical Cabinet, Parts 72 to 84 inclusive. 8vo. *London*, 1823-4.

MR. DANIEL M'LEOD, C. M. H. S.

A Drawing of Amaryllis pulverulenta.

MR. WILLIAM MASTERS, C. M. H. S.

Catalogue of Greenhouse Plants, &c. cultivated and sold by William Masters, Canterbury. 12mo. 1822.

MR. ANDREW MATTHEWS.

Phillips's Catalogue of Fruit Trees for 1822. 8vo. *London*, 1822.

MR. RICHARD MORRIS.

The Botanist's Manuel, a Catalogue of hardy-exotic and indigenous Plants. By Richard Morris. 12mo. *London*, 1824.

MR. JOHN NEWMAN, C. M. H. S.

Sketch of a Seedling Hibiscus.

MR. HENRY PHILLIPS, F. H. S.

Sylva Florifera; The Shrubbery, historically and botanically treated. By Henry Phillips. 2 vols. 8vo. *London*, 1823.

SIGNOR ANTONIO PICCIOLI, C. M. H. S.

Pomona Toscana, che contiene una breve descrizione di tutti i Frutti che si coltivano nel suolo Toscano, per servire alla Collezione in Gesso dei Medesimi, pubblicata da Antonio Piccioli. 4to. *Firenze*, 1820.

A Collection of 150 Models, in plaster, of the Fruits of Tuscany, described in the above work.

M. CHARLES FRANCOIS PIERARD, C.M. H. S.

Essai sur la Greffe de l'Herbe des Plantes et des Arbres. Par M. le Baron de Tschudy. 8vo. *Metz*, 1819.

M. PHILIPPE AUGUSTE JOSEPH MAIRETTE DE PRONVILLE, C. M. H. S.

Sommaire d'une Monographie du Genre Rosier. Par M. De Pronville. 8vo. *Paris*, 1822.

Du Rosier, principalement considéré comme Arbrisseaux d'ornément. Par M. Pronville. 8vo.

MR. JOHN ROBERTSON, F. H. S.

A Plan for the Cultivation of Grapes in the Field, without the aid of walls or glass. 8vo. *Liverpool*, 1823.

THE MANAGERS OF THE ROYAL INSTITUTION.

The Journal of Science and the Arts. No. 30 to 33 inclusive. 8vo. *London*, 1823-4.

THE ROYAL ACADEMY OF SCIENCES, PARIS.

Mémoires de l'Académie Royale des Sciences de l'Institut de France. 3 Tom. 4to. 1818-1820.

THE ROYAL SOCIETY.

Philosophical Transactions of the Royal Society of London for the year 1823. 2 Parts. 4to. *London*, 1823.

THE ROYAL SOCIETY OF EDINBURGH.

Transactions of the Royal Society of Edinburgh, vols. 4, 5, 6, 7, 8 and 9. 4to. *Edinburgh*, 1798-1823.

M. DUMORTIER RUTTEAU, C. M. H. S.

Observations Botaniques. Par B. C. Dumortier. 8vo. *Tournay*, 1823.

JOSEPH SABINE, ESQ. Secretary.

Travels in the Interior of America in the years 1809, 1810, and 1811. By John Bradbury, F. L. S. 8vo. *Liverpool*, 1817.

A Supplement to the Appendix of Captain Parry's Voyage for the Discovery of a North-west Passage, in the years 1819-20; containing an Account of the Subjects of Natural History. 4to. *London*, 1824.

HENRY ADOLPHUS SCHRADER, M. D. F. M. H. S.

Monographia Generis Verbasci. Auctore Hen. Adolp. Schrader, Sect. 1 et 2. 4to. *Gottingæ*, 1813-1823.

HARRY SCOTT, ESQ. C. M. H. S.

Catalogue des Arbres, Arbrisseaux et Plantes cultivées dans les Pépinières de Catros et Gerand à Bordeaux. 8vo.

M. SEYFFER.

Die Obst-Sorten der Königlich Württembergischen Obstbaumschule zu Hohenheim bei Stuttgart. 8vo. *Tübingen*, 1823.

WILLIAM SHAW, ESQ.

Drawing of the Isabella Grape.

JOHN S. SKINNER, ESQ.

The American Farmer; containing original Essays and Selections on Rural Economy and internal Improvement. Edited by John S. Skinner, 4 vols. and 31 Nos. of vol. 5. 4to. *Baltimore*, 1821.

SIR JAMES EDWARD SMITH, Pr. L. S. Honorary Member.

The English Flora. By Sir James Edward Smith, M. D. &c. vols. 1 and 2. 8vo. *London*, 1824.

THE SOCIETY OF ARTS.

Transactions of the Society for the encouragement of Arts, Manufactures, and Commerce, vol. 41. 8vo. *London*, 1823.

JOHN STEVENSON, ESQ. F. H. S.

A Practical Treatise on the Morbid Sensibility of the Eye. By John Stevenson. Third edition. 8vo. *London*, 1819.

THE REV. GEORGE SWAYNE, A.M. C.M. H. S.

Flora Britannica Indigena, or Plates of Indigenous Plants of Great Britain. By John Walcott. 8vo. *Bath*, 1778.

MR. JOHN TAYLOR, C. M. H. S.

A Drawing of Passiflora Herbacea.

MR. RICHARD TAYLOR.

The Philosophical Magazine and Journal, Numbers 302 to 311 inclusive. 8vo. *London*, 1823-4.

M. ANDRE THOUIN, F. M. H S.

Monographie des Greffes. Second edition. 4to.

LE CHEV. MICHELL TENORE, M. D. F. M. H. S.

Catalogus Plantarum Horti Regii Neapolitani ad An. 1813. 4to.

Appendix Prima ad Catalogum Plantarum Horti Regii Neapolitani, anno 1813 editum, Ed. alt. 4to. *Neapoli*, 1819.

MR. THOMAS TREDGOLD.

Principles of Warming and Ventilating Public Buildings, &c. By Thomas Tredgold, Civil Engineer. 8vo. *Lond.* 1824.

LUDOLF CHRISTIAN TREVIRANUS, M. D.

Die Lehre vom Geschlechte der Pflanzen in Bezug auf die neuesten Angriffe erwogen, von L. C. Treviranus, M. D. 8vo. *Bremen*, 1822.

JOHN TREVELYAN, ESQ. F. H. S.

The Manner of raising, ordering, and improving Forest and Fruit Trees, &c. By Moses Cook. 4to. *London*, 1679.

A Treatise on Fruit Trees. By Thomas Hitt. Second edition. 8vo. *London*, 1757.

The British Gardener's Calendar. By James Justice. 8vo. *Edinburgh*, 1759.

An Essay upon Gardening; containing a Catalogue of Exotic Plants for the Stoves and Green-houses of the British Gardener. 4to. *York*, 1793.

A Catalogue of Forest and Fruit Trees, and Evergreens and flowering Shrubs, sold by John and G. Perfect, in Pontefract, Yorkshire. 12mo. *York*, 1793.

A Catalogue of Foreign and Native Forest Trees, &c. sold by A. Dickson and Sons at Hassendeanburn. 8vo. 1795.

MR. JOHN TURNER, Assistant Secretary.

Medical Tracts read at the College of Physicians. By Sir George Baker 8vo. *London*, 1818.

A Botanical Nomenclature, containing a systematical Arrangement of the Classes, Orders, Genera, and Species of Plants. By W. Forsyth, jun. 8vo. *London*, 1794.

JEAN BAPTISTE VAN MONS, M. D. F. M. H. S.

Catalogue descriptif abrégé, contenant une partie des Arbres Fruitiers qui depuis 1798, jusqu'en 1823 ont formé la Collection de J. B. Van Mons. 12mo. *Louvain*.

Vollständiges Lexicon der Gärtnerei und Botanisk. Von Dr. Friedr. Gottlieb Dietrich. 2. Auflage. 1 Band. 8vo. *Berlin*, 1820.

Joannis Devyver Bierbeecensis, Medicinæ in Universitate Lovaniensi Studiosi Responsio ad Quæstionem, &c. &c. propositam quæ Præmium reportavit. 4to. *Lovanii*, 1823.

Pharmacopie usuelle Théorique et Pratique. Par J. B. Van Mons. 2 tom. 8vo. *Louvain*, 1821.

Société d'Agriculture et de Botanique de Louvain, Exposition d'Hiver 1824. 8vo. *Louvain.*

Annales Générales de Sciences Physiques. Par MM. Bory de St. Vincent, Drapiez, et Van Mons, 22 Livraisons. 8vo.

Elenchus Plantarum Horti Botanici Lovaniensis, 1823. 8vo. *Lovanii.*

Société de Flore de Bruxelles, 1ere 3eme et 4eme Exposition Publique. 8vo.

Naamlijst van Planten en Gewassen, ingezonden op de vijfde openbare Tentoonstelling, door de Nederlandsche huishouderlijke Maatschappij gehouden te Haarlem, 1822. 8vo. *Haarlem.*

Almanach du Jardinier-Fruitier. 12mo.

De Cinnamomo Disputatio, quâ Hortum Medicum Bonnensem, feliciter instructum, rite inauguraturi res eius, rei herbariæ studiosis, commendant C. G. Nees ab Esenbeck, Dr., et Th. Fr. Ludov. Nees ab Esenbeck, Dr., fratres, horto medico Bonnense Præpositi. 4to. *Bonnæ*, 1823.

M. PIERRE PHIL. ANDRÉ VILMORIN-ANDRIEUX, C. M. H. S.

Le Bon Jardinier Almanach pour l'année 1824. 12mo. *Paris*, 1824.

JAMES WARRE, ESQ. F. H. S.

The past, present, and probably future State of the Wine Trade. By James Warre. 8vo. *London*, 1823.

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