Thomas Sommerville.

The uncertainty which, as we have seen, surrounds the date of Don's quitting his post as Principal Gardener attaches also to the time of advent of his successor, who was Thomas Sommerville. Assuming that the appointment was made in 1807, at the end of which year we know that Don was again settled in Forfar, Dr. Rutherford's choice had fallen upon a young man of some twenty-four years of age, and the presumption is that he was a lad trained and working in the Garden.[1] But of this and of incidents in the life of Thomas Sommerville, we know nothing. His tenure of office was short, for he died on 17th March, 1810, in his twenty-seventh year,[2] and was buried in St. Cuthbert's Burying Ground.[3]

The only references I have met with in literature to Thomas Sommerville are these :—

A writer, under the pseudonym "Quoth Timon," of an article in the *Scots Magazine*, LXXI (1809), p. 404, entitled "Some Suggestions for the Improvement of the Edinburgh Botanic Garden," says—"Here we shall, in the first place, express the satisfaction we derive from the admirable style in which the Botanic Garden is at present kept, at least in so far as depends on the Superintendent[4]. We have long been familiar with this garden ; but at no period in our observation can we discover a more judicious plan to have been pursued in the management of the various plants (which indeed their health so strongly indicates), or better taste in the general system. In gardening, every likely

[1] This presumption is supported by Prof. Rutherford's confession of embarrassment in the selection of a successor to Sommerville through having no one on the garden staff qualified for the post. See his letter of 19th March, 1810, to Sir Joseph Banks on p. 294 of these "Notes."

[2] "Died on the 17th March, aged 27, Mr. Thomas Sommerville, Superintendent of the Royal Botanic Garden, Leith Walk ; a young man of great abilities both as a professional gardener and botanist."—*Edinburgh Courant*, March 22, 1810. Also *Scots Magazine*, LXXII (1810), where the name is spelled "Somerville" and the place of death is given "at his house, on Leith Walk."

[3] "Thomas Sommervell from Bottany Gardens on shoulders."—*Journal of St. Cuthbert's Burying Ground*, March 21st, 1810.

In Miss McNab's possession is a "Catalogue of Minerals, Fossils, Books, &c., which belonged to the late Mr. Thos. Somerville, Manager of the Botanic Garden, Edinburgh.—To be sold on Saturday, April 28, 1810, at his house, Botanic Garden, Leith Walk, by Wm. Bruce, jun."

[4] At this time Sommerville.

exhibition of what is beautiful in nature has a fine effect; winding walks, where the line of beauty is observed, are peculiarly pleasing; at every turn we experience increased pleasure, from the combined beauties of art and nature; and in this particular we remark the walks lately laid out in this garden, which certainly do honour to the good taste of the projector."[1]

In the same Magazine, LXXII (1810), p. 166, Dr. Neill, in a short note about the Botanic Garden, says—"This unfortunate garden, on the neglected state of which we have, for the last two years, been occasionally commenting, has sustained an additional misfortune in the loss of its superintendent, Mr. Thomas Sommerville. This promising young man, after having lingered for many months in a gradual decline, died on the 17th instant, at the early age of 27. He possessed very considerable abilities, both as a professional gardener and a botanist; and had he lived, would doubtless have distinguished himself in this latter respect."

Mr. Robert Maughan,[2] in a footnote to "A List of the rarer Plants observed in the neighbourhood of Edinburgh (Memoirs of the Wernerian Natural History Society, Vol. I (1811), p. 246), refers to Sommerville as "a young man of very promising abilities both as a professional gardener and as a botanist."[3]

From these notices we may gather that Sommerville was a competent Principal Gardener, and that, like his immediate predecessors, he was also diligent in search after native plants.

[1] The style of the article suggests Dr. Neill as the writer.

[2] Robert Maughan (1769-1844): b. Edinburgh, 1769; d. London, 1844. F.L.S. 1809. Deputy Controller of Inland Revenue in Scotland. Original Member of the Botanical Society of Edinburgh. Made large herbarium of Scottish plants which he took to London, where he settled with a married daughter in 1840 on retirement from the Civil Service. His son, Edward John Maughan (1790-1868)—(b. Edinburgh, 1790; d. Edinburgh, 1868. Inspector of Taxes at Perth, afterwards at Edinburgh)—was also a keen botanist, and like his father is the authority for the localities of many Scottish plants in "Floras" of the first half of last century. To Miss Maughan, daughter of E. J. Maughan, who, with her sisters, is living at this date in Edinburgh, I am indebted for the information in this note.

[3] Sommerville is cited in the list, which was in the press at the time of his death, as authority for the following plants and localities:—*Beta maritima*, seashore near Kirkcaldy; *Convallaria majalis*, Arniston and Collington Woods; *Epipactis cordata*, firwood between Woodhouselea and the Bush, peat-bog near Ravelrig Toll, on the Pentlands; *Papaver cambricum*, banks of Water of Leith near Woodhall; *Polytrichum alpinum*, Eastern Cairn Hill, one of Pentlands; *Pulmonaria maritima*, Fifeshire coast near Seafield Tower; *Orchis Conopsea* var. *flore albo*, meadow ground south of Dalmahoy Hill; *Rubus Chamæmorus*, top of Eastern Cairn Hill; *Saxifraga umbrosa*, Auchindenny Woods; *Utricularia minor*, peat-pit near Ravelrig Toll.

William M'Nab.

William McNab.

With Portrait.[1]

Through Sommerville's death, Prof. Rutherford found himself called upon to appoint a Principal Gardener for the fifth time during his tenure of the Regius Keepership—to date of twenty-three years. Fortune had not smiled on his appointments so far. Three of the men whom he had chosen had died in harness—two of them when still young and giving promise of much in the future—and the fourth had left because of strained relationships, as we have reason to think. We may imagine, therefore, that the making of this new appointment would give him some concern, which would not be lessened because of its urgency in view of the near approach of the beginning of the Summer Session of the University. There was no one on the staff of the garden, as we learn from him in a letter printed hereafter, whom he could promote, and the salary of the post appears to have been inadequate as an attraction to an outsider. On this latter point we have Dr. Neill writing at this time in his note, already referred to, in the *Scots Magazine*, LXXII (1810), p. 166, and giving strong expression to what we may suppose to have been the general feeling regarding it. He says :—

"While the situation of superintendent is thus vacant, it can give no offence, we should suppose, if we remark upon the insufficiency of the salary. Forty years ago, the keeper of the Botanic Garden may have found himself 'passing rich with forty pounds a year.' But that such a pittance must now be utterly inadequate is too evident to require illustration. In this country there is little difficulty in finding men of merit in the gardening profession; indeed, Scottish gardeners are held in repute all over the empire. Several excellent cultivators and keen botanists have, during the last ten years, issued from the Edinburgh Botanic Garden itself. To become Superintendent of the Physic Garden of Scotland is justly accounted a horticultural and botanical honour. But it is hard to ask a person to

[1] I am indebted to Miss McNab, granddaughter of William McNab, for the photograph from which this portrait has been taken. The only published portrait of William McNab is one in profile from a sketch by his daughter, a copy of which was given to each subscriber to the testimonial presented to Mr. McNab in 1844 (see page 316).

leave a situation where he receives from £60 to £100, and to offer him £40 a year. The 'feather in his cap' will not, in these times, make up for the deficiency. The perquisites of the place are very trifling and uncertain, and we understand, cannot be reckoned worth more than £10 a-year."

The steps taken by Prof. Rutherford to fill the vacancy are shown in the following letters :—

Dr. Rutherford to Sir Ioseph Banks.[1]

Edin. 19 March 1810.

Sir,—I trust that you will pardon the liberty I take of applying to you in the present occasion, as I know no one who is so capable of giving me advice and assistance as you are. I must take the liberty of acquainting you that Mr. Sommerville, who was gardener of the Botanic Gardens in this place, is just dead, and I am in the greatest anxiety to fill up the place properly, and indeed as soon as possible, since the season of the year is now so far advanced. Unfortunately the workmen now in the garden are in a manner entirely strangers to me, having come into it only a week or two ago, and I am thus more embarrassed than I should otherwise be. Such being the case, I should esteem it as a singular obligation if you could recommend any person that you think might be qualified for the office. I need say nothing of the talents required, you are a perfect judge of this subject. The Emoluments are £40 a year salary and whatever gratuities may be given by people who visit the garden, besides I allow him 2/6 from each of the students. Should you recollect any fit person who might incline to enter in this employment, I shall esteem it as a particular favour if you take the trouble to mention him to me. I hope you will excuse the liberty I have taken. I have the honour to be with the greatest respect, Sir,

Your most obed. and most humble Servant,

(Sgd.) D. RUTHERFORD.

Sir Joseph Banks to Mr. Aiton.[2]

My dear Sir,—I send the enclosed to you as a matter of course, if it should be the means of providing for any one of your worthy lads it would be a great satisfaction to me but I fear the salary is much too small unless the Emoluments make a much greater addition to it than can be expected.

Always Yours

Jos. BANKS.

March 22, 1810.

[1]

[2] William Townsend Aiton (1766-1849). See Britten and Boulg., Bibliog. Index. Printed by permission from a copy in the possession of Miss McNab.

Sir Joseph Banks to Dr. Rutherford.[1]

My Dear Sir,—The high respect I feel for the Botanic Institution at Edinburgh and the personal regard I have for the worthy Professor have made me anxious to fulfil the commission contained in your last favour. I therefore applied without delay to Mr. Aiton whose foreman I knew to be particularly qualified to fill the office now vacant in your garden, being a man eminently skilled in the names of plants, as well as in their culture, modest, unassuming, quiet, civil and obedient. As he has been 10 years at Kew Mr. Aiton is desirous of providing for him and will therefore readily part with him if he thinks the offer likely to produce and secure a comfortable settlement for life. Of this however McNab the foreman has some doubts, and in truth as the price of every necessary of life has of late increased materially, and still continues to increase, or rather as the value of money diminishes every day his doubts are not without a rational foundation.

I have however brought him to say that if £10 a year can be added to the salary of £40 he will thankfully accept the place.

Whether this is feasible or not I cannot at all judge. I can only say that as it seems necessary that all fixed salaries should keep pace in their advancement with the admitted depreciation of money, the present is a very proper time to make an addition, and this as I do not know that there is in England so proper a man for the present vacancy as McNab is. He has all the knowledge both of botanical nomenclature and of Horticulture that Don[n][2] now gardener of Cambridge possesses—I think in a better style, and he is more modest and unassuming by far.

If it is not practicable to obtain an increase of salary I shall still do my endeavour to persuade him to accept the place as I think he may be confident that an addition must soon be made, if it cannot be done at this time.

I am My Dear Sir,

Your very faithful and very humble Ser.

(Sgd.) Jos. BANKS.

26 March 1810.

Edinr. 1 April 1810.

Dr. Rutherford to Sir Joseph Banks.[3]

Dear Sir,—I had the honour to receive your very kind letter two days ago, and I beg leave to offer my most earnest thanks for the trouble you have so readily taken, in procuring a gardener for the Botanic Garden. The salary of £40 which I mentioned, was what I had been in use of allowing. Surely I can have no objection to

[1] Printed by permission of Miss McNab, who has the original letter.

[2] James Donn (1758-1813). See Britten and Boulg., Bibliog. Index.

[3] Printed by permission from a copy in the possession of Miss McNab.

raising it to £50 or some shillings below £50 just to avoid the Tax. Indeed I had determined to do so as soon as I was assured of an additional allowance for the maintenance of the Garden, which I believe is already granted. I hope then that Mr. MacNab will have no objection to the Place; everything that depends upon myself shall be done to render his situation comfortable and agreeable, only one article I should wish him to understand that nothing whatever is to be sold or given from the Garden unless with my permission. Indeed I have had occasion to remark such depredations, unfortunately not however just at the time things were removed, as can hardly be repaired.[1] You may believe that I am anxious that he could be with me as soon as possible and I should be extremely obliged to you if you convey him such intelligence. Indeed I should like to hear from him as there are some plants which I wish him to provide for me before he leaves London. I am quite ashamed to use such freedom with you, but I sincerely hope you will pardon me when you consider the anxiety I have to fix a proper person in the Garden.

I have the honour to be with highest respect and esteem

Dear Sir,

Your most obedient and most humble Servt.

D. RUTHERFORD.

Fortunately for the Edinburgh Garden the post thus offered to William McNab had sufficient attractions to induce him to make the pecuniary sacrifice involved in acceptance of it, but it was not until May that he came to Edinburgh, as we learn from the following letter of introduction :—

Mr. W. T. Aiton to Dr. Rutherford.[2]

Dear Sir,—This letter will be delivered to you by my much esteemed friend Mr. William McNab, many years my principal foreman in the Royal Gardens at Kew. Altho I think it unnecessary to add any thing to the testimony of the great and good Sir Joseph Banks, in favour of this very promising young man, I cannot refrain observing that McNab enjoys in a superior degree the best requisites of his profession as a gardener, and the sincerity and real worth of an honest Man, and as such I beg leave to introduce him to your protection. being Dr. Sir with great regard very faithfully yours

W. T. AITON.

Kew Gardens,
12 May 1810.

[1] Have we here a hint of a cause of "want or cordiality" between Professor Rutherford and George Don? See page 66 with footnotes 2 and 3, and page 281 with footnote 2, of this volume.

[2] Printed by permission from a copy in the possession of Miss McNab.

William McNab, who thus entered upon his duties in the Royal Botanic Garden at Edinburgh, and who of all the Principal Gardeners stands highest in reputation in Horticulture and is deservedly placed in the front rank of the world's gardeners, was born one of a family of twelve[1] 12th August, 1780, at Knockcavish,[2] in the parish of Dailly, Ayrshire, where his father, James McNab, was farmer. During boyhood he assisted his father in the work of the farm, and at the age of sixteen began apprenticeship to gardening in the garden of Mr. Kennedy of Dunure, at Dalquharran in Carrick. At the end of a three year period there he obtained, through Messrs. Dickson & Co., of Edinburgh,[3] a situation in the gardens of the Earl of Haddington at Tyningham in East Lothian. Thence he went in 1801,[4] after fourteen months' service,[5] to London with a recommendation to William Aiton, of the Royal Gardens at Kew, by whom he was engaged on 12th March for employment under him at Kew.

[1] Of his brothers:—James became factor first at Kerraughtry, afterwards at Culloden; another, Gilbert, became Sheriff-Clerk Depute of Ayrshire 20th June 1821, as I am informed by Sheriff-Clerk Patrick of Ayr.

[2] Variations in spelling taken from popular pronunciation occur, such as Knockcaves, Knockawish, and in the Birth Register the word is written Knockaways. The Rev. George Turnbull, D.D., of Dailly, has kindly given me this information.

[3] At the time leading Nurserymen in Edinburgh. They have already been referred to in these "Notes" as friends of Mackay and Don.

[4] "That the Bearer William McNab a young unmarried Man by Trade a Gardener, Aged about twenty years, has lived in this Parish, mostly from his Infancy to this present Date, when he intends to leave it, and go to London or its neighbourhood, in order to gain farther insight into his said Trade of Gardener, and has always behaved himself in a sober, honest, and regular manner, free of all public scandal or Grounds of Church censure known here—Is by appointment of the Kirk of Session of this Parish of Dailly, County of Air, North Britain, given and signed in their name the twenty-fifth day of January One thousand eight hundred and one years by—John Thomson, Minister; James Welsh Sess. Clerk."—*By permission of Miss McNab, who has the original.*

John Thomson (1778-1840) who signed these "lines" was the renowned landscape painter who moved to Duddingstone in 1805, and is commonly known as "Thomson of Duddingstone." He also was born in the parish of Dailly. In after years McNab, on his return to Edinburgh, renewed personal acquaintance with Mr. Thomson, and an intimate friendship continued until Mr. Thomson's death.

[5] "This is to certify that the Bearer William McNab served as Journeyman Gardener for the Space of 14 months in the Earl of Haddington's Gardens at Tynningham—In which time He Behaved Himself soberly and Honestly always paying due attention to His Business—Thomas Thomson; Tynningham, Novr. 8th, 1800."—*By permission of Miss McNab, who has the original.*

In 1803 he succeeded William Kerr as foreman there, in which position he continued until after nine years' service he received the call to Edinburgh.

The times were troubled when William McNab found himself thus within a circle where the personal influence of King George III. was dominant. It is recorded of McNab that he attracted in a special manner the attention of the King, and this, we may believe, not merely because of his capacity as a gardener but no less on account of the enthusiasm with which he threw himself into projects for the defence of the Country.[1] For the King took great interest in the Volunteer movement of the time and particularly in that current of it which affected the area in and about his own domain at Kew, and the fact that young McNab joined the Corps of Kew Volunteers[2] at its institution[3] would be known to the King and be a commendation in his eyes.

[1] Through the Rev. Dr. Turnbull of Dailly, I learn that a niece of William McNab, Mrs. Andrew Hannah, aged about 80, is at this date living in the parish of Dailly, and relates that "the King, struck by his appearance, said to him that he ought to be in the army."

[2] Here is a copy of McNab's enrolment card:—"William McNab | Enrolled a Volunteer | in the | Kew | Volunteer Infantry | Who Loyally and Voluntarily offered his | personal service in the defence of his | King | and | Country | September 1803. |" On the reverse of the card there is:—"The Engagement | with the | Rules | and | Regulations | of the | Kew | Company of | Volunteer Infantry | Brentford | Printed by P. Norbury | 1803. |"—*By permission of Miss McNab, who has the original.*

[3] The following is a copy of the Appeal for Volunteers which McNab had preserved:—"ADVANTAGES | Obtained By | VOLUNTEERS, | SERVING in DEFENCE of their COUNTRY. | KEW, | August 11, 1803. | The Committee wish to point out to the Inhabitants of the Parish of Kew, the advantages that will arise in forming a VOLUNTEER CORPS, in preference to permitting the compulsory Clauses of the DEFENCE ACT to take effect. It is more respectable for the Inhabitants;—it is conformable to the wishes of the Legislature;—it marks the Loyalty, Spirit, and Zeal of the Parish in the Service of their Country;—and it is particularly *to be observed, that they will have the Privilege of serving together, under Officers chosen from among the oldest Inhabitants;—that they will not be drafted into any Regiment, Battalion, or Corps of Regulars, Militia, or Fencibles;—that they will not be called out of their District, except in case of actual Invasion, or the enemy appearing upon the Coast, and then not out of the Kingdom.* | Norbury, Printer. Brentford."—*By permission of Miss McNab, who has the original.*

Miss McNab has also allowed me to see a copy of a booklet containing the Rules of the "Kew Volunteer Infantry." On page 3 is a recommendation of the "Rules" over the signature of "John Haverfield, Chairman, P.T.", and then on page 4 there is "State of the | Company | of | Kew Volunteer Infantry. | Captain | Robert Browne | First Lieutenant | Robert Tunstall | Second | Lieutenant | William T. Aiton | Sergeants | T. Hofland, T. Healey, G.

Prior to the Volunteer movement taking shape at Kew the Militia Ballot would seem to have caused anxiety to the staff of gardeners, and the following document in McNab's writing (now in the possession of Miss McNab), whilst it is witness to young McNab's force by showing that already within two years of his arrival at Kew he was a leading spirit on the staff, has the further interest of an illustration of what must have been a not uncommon procedure in the existing state of the country :—

"Kew Gardens, 8th December 1802.

"We the undersigned have agreed to form a Society for the purpose of alleviating the burthen which would fall upon the individuals who may chance to be balloted to serve in the Militia. It is proposed that each member shall deposit Half a guinea (either all at once or as it may be convenient) in the care of a proper person whom the Society shall think proper to appoint. If any of the members are balloted the said money is to be applied to the purpose of hiring Substitutes as far as it goes; if not sufficient the person or persons whose misfortune it is to be balloted must make up the deficiency without any claim upon the Society. These regulations will be subject to any amendment the majority may think proper or may be relinquished altogether provided a better expedient can be found. Upon this consideration the present may be considered only as a proviso against the consequences that delay might be attended with :—William Kerr, William McNab, John Haddon, Christ. Bearpark, John Taylor, Harry Jones, John Snow, George Hurst, John Wheatly, Dun. Montgomery, Daniel Forrestill, John Fenn, Adam Taylor, Romeo Forbes." [1]

Pepper. | Rank and File | sixty | Fugel-man | Two Drummers | Two Fifes | Armourer." | Pages 5 and 6 are occupied by "The Engagement," as follows :— "That every Member of the *Kew Volunteer Company of Infantry*, now formed in the Parish of *Kew*, in the County of Surrey, doth freely and willingly engage himself to serve in the said Company of Volunteers, according to the terms of Service prescribed in the Defence Acts of George III., Chaps. 96, 120, and 121, namely, that whenever called upon by the Direction of His Majesty, he will voluntarily march to repel *Invasion*, or for the suppression of *Riots* and *Tumults*, according to the Provisions and Clauses in the said Acts, claiming and enjoying the Exemptions, Benefits, and Privileges therein provided; and that he will faithfully conform to the several Duties, Rules, and Regulations hereby established, to which he subscribes his assent." Then follow the "Rules, etc."

[1] Perhaps the luck of the Ballot took away one of the staff and absorbed the funds of the Society, for amongst Wm. McNab's papers there is also this other document recording the institution of a new Society in little more than six months' time :—

"Kew Gardens, 18th July 1803.

"We the undersigned have agreed to form a Society for the purpose of alleviating the burthen which would fall upon the individuals who may chance to be balloted to serve in the Militia or the Army of Reserve. It is proposed that each member

The William Kerr[1] whose name heads the list of Members of the Society of 8th December 1802 was foreman of Kew Gardens at the time, but left Kew for China in 1803 and was succeeded as foreman by McNab. Scroll copies preserved by McNab of two letters[2] written by him to Wm. Kerr seem worthy of reproduction here alike for the interest of facts mentioned and as indication of the character of McNab himself:—

William McNab, Kew, to William Kerr, Canton.[3]

My Dear Friend,—As this opportunity offers I have taken up my pen to give you a few of the Particulars that has happened at Kew since you left it. Although there has nothing very interesting happened yet there is something which will Bring you in mind of the Old Place and your Acquaintance which you left Behind. (I shall Begin with myself first.) I still Continue in the same situation which I was Placed in when you left Kew. It would be unnecessary to say that there is a number of Difficulties attending it. But a man must make up his mind to Encounter these where ever he goes and Mr. Aiton has Behaved to me in every respect more like a Father than a Master.

He has had an addition to his Charge by the Death of Mr. Forsyth[4] late of Kensington who Died in August 1804, when His Majesty was Pleased to Appoint Mr. Aiton Gardener there Likewise, and Mr. John Aiton has the whole of Windsor Gardens to himself. He has Mr. J. Vace and Tidie under him the same as when you went away. All the Rest of that worthy Family are well.

There is no Particular alteration in the Botanic Garden since you went.

shall deposit the sum of Nine shillings entering and three shillings every week till the fund amounts to the sum of ten pounds to every member whose misfortune it is to be Balloted. These regulations will be subject to any amendment the majority thinks proper, or may be relinquished altogether provided a better expedient can be found:—William McNab, C. Bearpark, James Law, John Haddon, Robert Clue, Henry Jones, John Fenn, Edward Dare, Alexr. Morison, John Snow, John Taylor, Isaac Wadie, John Wheatly.

"Paid 6 Guineas to Mr. Bearpark, Augt. 15th. Began a New Club, August 20th 1803."

Does this concluding sentence indicate that the lot had fallen upon Mr. Bearpark?

[1] William Kerr (—1814). See Britten and Boulg., Bibliog. Index. His name is preserved in the familiar garden shrub *Kerria*.

[2] Now in the possession of Miss McNab, by whose permission they are printed here.

[3] The scroll copy is undated, but intrinsic evidence fixes 1805 as the year of writing.

[4] William Forsyth (1737-1804). See Britten and Boulg., Bibliog. Index. Name preserved in the charming garden shrub *Forsythia*.

The Collection of Plants is greatly Augmented. The Collection of Seeds from the Late Mr. P. Good[1] (whose Death is so much Regretted) which was sown in the Spring Before you went away are doeing very well and all New to this Country.

There was a very Valuable Collection of Living Plants Collected in the Province of Cyanna, South America intended for the National Garden at Paris which was taken By Two English Privateers in August 1803 and Brought into this Country when His Majesty purchased them for Kew Garden. There was 129 Large Boxes and from 20 to 50 Plants in Each Box, of Course there was a number of them dead. But them that is alive has made a Great Addition to the Collection at Kew and the Most of them are New.

Besides the very Valuable Collection which you have honoured the Royal Gardens with, it would Be unnecessary for me to say anything Concerning them as I presume Mr. Aiton has given you a full account of them, I have only to say that they are doing very well; and every one is anxious that they should Flourish, For the Respect they owe to so worthy a Character as He who sent them.

There are many of your Acquaintance Left the Gardens and many New faces Come.

The old men in the Pleasure Garden are all much the same as usual. There is John Wheatly, Isaac Walker, Charles Aimer, John Colier, Romeo Forbes, John Fenn, Rd. Clue, Edward Dare, and Myself in the Garden that you know—John Haddon is Gardener to Lord Dundas in Yorkshire and is doing very well. John Taylor is Gardener to R. H. Rucker, Esqr., Near Wandsworth, Surrey, and is doing well. Duncan Montgomery is still with the Duke of Montrose. George Mackay is with Mr. Buchannan, Camberwell Nursery. James Archibald is still in His Place. Mr. Bearpark is gone to Colonel Bowman at Briton Hall Yorkshire to be Gardener; it is the same Place that William Allen went to from Kew who I am sorry to say is no more. Mr. R. Chandler is doing very well, He has plenty of business and He has a fine Boy about 18 Months old. Mr. Alexr. Richardson is still with Earl Tankerville. Mr. Dare, Mr. Morgan, and most of your other Acquaintance in the Garden are in the same way as when you left Kew.

I had almost forgot to mention that Mr. Snow Could not be Comfortable out of Russia so He went of to it in September 1803, where he still Remains and I Believe is doing well. I am sorry to say that Mr. Philipson who went to the . . . . is no more. David Edgar from Richmond Hill is gone to the Marquess of Bath Near Bath, He is going on very well. It is a much larger Concern than what he had before.

Your Cousin Mr. Millar has been at Kew this 18 Months as Foreman to Mr. Pepper. He is well, you will find a letter from Him in a Small Box of Annual Seeds which is sent on Board the Hope along with the Plants.

[1] Peter Good (— 1803). See Britten and Boulg., Bibliog. Index. Name preserved in the greenhouse shrub *Goodia*.

Mr. Hoffland and Mrs. Hoffland[1] are Both well and often Enquiring after you.

Mr. Addington and Mr. Ayton are still at Kew Palace in the same Capacity as they were. The Palace is still going forward But far from Being Finished.

I am,

Kew, April 29th 1806.

My Dear Friend,—As this opportunity offers I have taken up my pen to write you a few lines although I have got nothing very particular nor interesting, yet I thought it might be some satisfaction to hear from the Place where you have spent many an hour in; and the acquaintance that you have spent many an hour with. I wrote you last year when the Plants went which you have Received Before this Time I hope. In that letter I mentioned Every thing that I thought was worth mentioning since that period there is nothing very particular taken place.

Most of your acquaintance is at Kew that was at it at that time, and most of your other acquaintance which was gone Before that time are much in the same way as they were in then. I still remain at Kew yet. But does not expect to be here much longer, when I do leave I expect to go a little nearer you. But you will hear the first opportunity that offers after I leave.[2]

Everything in the Garden goes on much in the same way as usual. The Collections has been greatly increased lately with Seeds from N. Holland and with the Plants from you particularly with first Collection as they came in very good Preservation and are growing very fine. The last Collection (through bad management in Bringing home) was not in so good a state, but many of them are growing very well; but Mr. Aiton will mention the Particulars Respecting them in His letter.

I am sorry to say that Mr. Masson[3] (who has sent so many things to Kew) is no more. He died in Quebeck last winter.

Mr. Aiton and Mr. John A. and the rest of the family are all well, they are none of them married yet. Your old acquaintance Mr. Richardson is married, he married the Housekeeper at Lord

[1] The parents of Thomas Christopher Hofland (1777-1843), the landscape painter, who was Sergeant in the Kew Volunteers. In this connection young McNab and the other members of the Kew staff would come in contact with him. But it is probable that William McNab had a closer tie with him, and indeed may have been cousin by marriage. Miss McNab informs me that she has reason to believe that Elizabeth Whiteman, wife of Wm. McNab, was a niece of the Mrs. Hofland referred to in this letter and mother of the artist. Certainly there was a continuous close intimacy between the McNabs and Hoflands, and a portrait of Hofland, painted by himself, is now in possession of Miss McNab.

[2] There is no evidence as to what was in his mind at this time, but in correspondence with his brother John, who was farming in Ayrshire—Miss McNab has kindly allowed me to see the letters—McNab several times refers to his desire to leave Kew.

[3] Francis Masson (1741-1805 or 6). See Britten and Boulg., Bibliog. Index.

Tankervilles. He is going on very well. Mr. Chandler is very well and has two sons to Succeed him in the Business. Miss Page is married to Mr. Paine a Butcher at East Sheen. If you had any Claims there you are Behind.

Mr. Millar still Continues at Kew with Mr. Pepper. He is very well. I saw him this Evening. He desired his Best Respects to you and I was to say all your friends are well.

There has been several Great Men died within this 6 months in this Country. Mr. Pitt died about 3 months ago, and Lord Nelson was killed in an Engagement with the Combined Fleets of France and Spain off Cape Trafalgar. His Loss has Been very much Regretted in this Country.

It does not come within the limits of this Letter to give you a general account of the Changes which has taken place in the National affairs since you left the Country. It is sufficient to say that Mr. Fox and Mr. Windham and most of the old opposition members are come into office now, and great things are expected from them, But how they will turn out we must let time determine. Had I thought on it sooner I should have sent you a few of the News papers in the box with the Books which might have been some satisfaction to look over, but as it is too late now I must take another opportunity.

I should be very proud of a few lines from you when you have an opportunity and Remain Dear Sir

Very faithfully yours, &c.

Mr. Wm. Kerr,
Botanist,
Canton.

(Sgd.) WM. MCNAB.

Arrived in Edinburgh, McNab threw himself into his work with what enthusiasm and success we may learn from the following contemporary comments:—

"A new superintendent (Mr. MacNab) has recently been appointed, in the place of Mr. Somerville, whose death we mentioned in the Magazine for March last. Mr. MacNab has for many years been employed in the Royal Gardens at Kew, and has thus had great experience in the cultivation of exotics. Through the kindness of his botanical friends in the south, he has already introduced into the Edinburgh Garden many of the new and rare species of stove and greenhouse plants, which were never before cultivated here. Among these are a number of New Holland plants, particularly six species of Banksia, and two of the rarest of the Mimosa tribe."[1]

[1] Dr. Neill in *Scots Magazine*, LXXII (1810), p. 367.

"Mr. Macnab from Kew is doing wonders at our Botanic Garden here, if there was but funds for improvements."[1]

"The personal exertions of the superintendent, or head gardener, Mr. Macnab, we believe to be unremitting; and it seems a public disgrace that they should not be better rewarded, and that his abilities and zeal should not be seconded by a small grant of the public money for the improvement of the garden.

"Notwithstanding this discouraging state of matters, Mr. Macnab has lately introduced many new or very rare plants into the garden. He has, in particular, carried the culture of exotic aquatics to a pitch hitherto unknown in Scotland."[2]

"At present the Garden enjoys a most active and intelligent superintendent, Mr. William Macnab, who, notwithstanding the discouraging circumstance of the funds for maintaining the Garden being extremely inadequate, has contrived not only to keep up but to increase the collection of plants."[3]

Nor is foreign testimony to the same effect wanting. On page 38 of the third volume of "Itinéraire et Souvenirs D'Angleterre et D'Ecosse, 1814-1826, Paris, Imprimerie de Prosper Dondey-Dupré, rue Saint Louis, No. 46, au Marais, 1834, there is the following record :—[4]

"Du palais du Parlement nous sommes descendus par High Street au Jardin Botanique, dans le fond de la vallée qui separe Arthur's-Seat de Calton Hill. Sa fondation date de 1764. Le Parlement d'Angleterre et la ville d'Édimbourg se cotisèrent pour faire les frais de cet établissement, et subvenir aux dépenses de son entretien. Bien que le sol soit mêlé de sable et de gravier, les arbres les plus délicats et les plantes les plus frêles y prospèrent. Les Systèmes de Linné et Jussieu y ont chacun une école distincte; et de savants professeurs font de cours qui sont très-suivis. Le premier jardinier est à la fois instruit, soigneux, et passionné pour son art. Il surveille specialement la culture et la temperature des serres que l'on chauffe à la vapeur. En passant de leur atmosphère plus ou moins tiède à l'air extérieur souvent brumeux et glacial, il a presque entièrement perdu la voix. A peine l'entend-on parler; et c'est d'autant plus pènible pour ceux qui l'écoutent, car il s'exprime avec clarté et elegance. Cet accident dont son âge semble augmenter la gravité, n'a point affabli son amour pour les familles végétales placées sous sa tutelle. Le moindre des individus qui les composent y a des droits. Il les montre tous avec une sorte

[1] Patrick Neill to Sir J. E. Smith, 15th Feb. 1811.—*Smith Corresp., Linn. Soc.*

[2] Dr. Neill in *Scots Magazine*, LXXIV (1812), p. 484.

[3] Dr. Neill, Essay on Scottish Gardens and Orchards, 1812, p. 101.

[4] I am indebted to Mr. A. P. Stevenson, Dundee, for this reference.

d'orgueil. . . . Notre guide a pour ses bruyères une prèdilection marquée. Il en possède une collection nombreuse. Quoiqu'elles soient égalment jolies, chacune a des droits particuliers à ses éloges. Quelle variété de découpures et de couleurs dans toutes ces petites corolles plus ou moins épanouies, éparses ou groupées sur les rameaux qui les portent, et parmi les épis de feuillage où les unes timides semblent se dérober, tandis que d'autres cherchent à en sortir afin qu'on les voie. Enfin, ici sont des myrtes en pleine terre et en espalier, là des arbustes indigènes ou exotiques. Une main amie protége l'enfance, la maturité, la vieillesse de toutes ces plantes, et s'attache à les préserver de l'influence d'un climat rigoureux."

The energy thus shown by McNab must have been an influential factor in bringing about the change which befell the fortunes of the Garden in a few years' time. The five acres to which the Garden was restricted was a small area in which to maintain such a representative collection of plants as the aspiration of the Principal Gardener now aimed at, and there was no prospect of an extension on the site because the surrounding land, hitherto occupied as nursery gardens, was being feued for building by the Heriot's Hospital Trust to which it belonged. So far back as the period of John Mackay's tenure of office as Principal Gardener expression had been given to a desire for a better site for the Garden, which, however, had not been satisfied.[1] When, therefore,

[1] Thus Dr. Patrick Neill, writing rom Edinburgh on 30th January 1832, under the pseudonym "Citizen," in a controversial pamphlet entitled "Where ought the New Cemetery to be placed?—In the Meadows? or in the King's Park?" says:—"I would suggest that some portion of the pasture-fields of the royal domain of Holyrood Palace,—one of the slopes, for instance, at the South-western base of Arthur's Seat,—should be appropriated to this sacred purpose. The whole domain is already in one sense a sanctuary; but the cemetery would truly deserve the name. Fifty or sixty acres, commencing about the Echoing Rock and the Powder Magazine, and extending in a westerly direction in the line of the foot path to Duddingstone (which would be turned a little to the south) to near the stile at Gibraltar House or the cottage which has now acquired the name of *Jeanie Deans' house*, would afford great variety of surface capable of every sort of embellishment, architectural and arboreous. In all places the soil would be dry. In some parts it would perhaps prove shallow; but the subsoil would certainly not be more difficult to penetrate than that of the Calton Hill. Against the ledges of rock which rise in various places, sepulchral arches and vaults, if such should be in demand, could be made to abut with great propriety. The space here pointed out would embrace to some extent the site selected, more than thirty years ago, by the late distinguished Mr. John Mackay, for a new Botanic Garden, which was then projected: for he included the Echoing Rock and the Wells of Weary (the latter now existing only in hallowed recollection, for they have unfortunately been annihilated by the Railway tunnel). I trust I may be permitted to assume, that a place chosen by so competent a judge for the site of a Royal Botanic

the dilapidated condition of the plant-houses, of which we have frequent mention in contemporary records, compelled the Government to give attention to the urgent representations of the need of capital expenditure upon them, the question of removal of the Garden to a better site was again raised, and, as we may conjecture, would be pressed with insistance by McNab.

The story of the negotiations and controversies in regard to this and of their ultimate issue will be told in the general account of the history of the Garden in a later number of these "Notes." For the purpose of this notice of William McNab it is necessary to say only that the movement for a new site was successful, and after the abandonment of one of nine and a half acres purchased in 1815 for a new Garden to the east of Holyrood Palace, an area of fourteen acres at Inverleith, which the Garden still occupies (with ground subsequently added), was acquired by the Barons of Exchequer, and thither the plants of the Garden in Leith Walk were brought during the years 1821 and 1822.[1]

The work which such a transference entailed could have fallen into no abler hands than those of William McNab, and we have evidence in abundance of his skill in disposing of plants in the open to the best advantage horticulturally and, at the same time, artistically, and also of the correctness of his conceptions in the designing of houses for plant-propagation. Some of these houses erected at this time are now in use, modified no doubt in details in accordance with improved methods, but in their main features having the form of the period of their erection. Some of the trees moved to the new Garden were of considerable size,

Garden is likely to be well adapted for an ornamental cemetery. The only objection to it as a garden was, that it would be rather too much exposed to wind: but this forms a strong recommendation in the other view. The yew, the Scots fir, and the Norway spruce (which in our climate must chiefly take the place of the cypress) would all flourish exceedingly in this portion of the King's Park; and the bay-laurel, the holly, Irish ivy, and other kinds of evergreen shrubs would likewise prosper well amid the tombs."

[1] It was in 1823, I think, that the last fragment of our Royal Botanical Garden was removed from its situation on the west side of Leith Walk, and that the transplantation of the whole to its present site at Inverleith was completed. No garden could be made to walk a mile with less injury to its health. Scarcely a single plant or tree was lost, and after recovering from their first sickness, they looked fresher and prouder than ever. Dr. Graham, the Professor, was a respectable botanist, and a good teacher, and in his first lieutenant, McNab, he had a most admirable practical man.—*Cockburn, Memorials*, p. 411.

and from McNab's notes which have been preserved we learn the dates of preparation of some of them in the old Garden, that of planting in the new Garden, and also the positions in which they were planted, and are thus enabled to recognise several of them, now stately specimens, in the Garden of to-day. His notes also give us particulars of herbaceous plants and shrubs, as well as of plants in pots, that were put in the new Garden.

The removal of such a collection of plants, and the formation of this Botanic Garden on a new site, gave McNab an unrivalled experience in transplanting[1] and planting shrubs and trees, both deciduous and evergreen, and the results of his experience with the last mentioned class he embodied at a later period in a pamphlet,[2] which, as it is difficult to obtain a copy—I have been endeavouring to find one for some years for the Library of the Royal Botanic Garden, and so far without success—and there is much sound advice in its pages, I have had transcribed from a copy in the Library of the University of Edinburgh, and print it as Appendix A to this narrative.

Established in the new Garden, McNab's further history is that of its Principal Gardener identified with its reputation alike for its collection of plants and their cultivation, and for the young practical gardeners trained in it. Most gardeners find an affinity in some group of plants which absorbs their interest more than do other groups. McNab was no exception, and was attracted in special degree by Heaths and plants which were then commonly called "New Holland Plants"—a class nowadays out of fashion and relegated to unmerited neglect by the crowd of easily-grown soft-wooded plants. The collection of these hard-wooded plants in the Royal Botanic Garden under McNab was renowned both for number of species and for size of specimens. In 1832

[1] In an article in the "Scottish Farmer and Horticulturist" for April 24, 1861, headed "McNab's Transplanting Machine," James McNab describes a machine which he says "was originally invented by my father, Mr William McNab, late Curator of the Royal Botanic Garden, where it has been in active operation for the last thirty-five years, with a degree of success not often witnessed."

[2] "Hints on the Planting and General Treatment of Hardy Evergreens in the climate of Scotland". By William M'Nab. Edinburgh, Thomas Clark, 38 George Street, 1830.

he gave to the world[1] the results of his experience in the management of Cape Heaths, and as this pamphlet is somewhat scarce, like his other publication already referred to, and may be reckoned still an authoritative work on the subject, I have added a transcript of it in Appendix B to this narrative.

It would have been strange had the excellent service of McNab as Principal Gardener failed to secure for him a recognition in the the way of salary and emoluments better than those for which he came to Edinburgh. Only in 1819 had his salary been raised, and then but from £50 to £60, and we find him driven therefore to present the following memorial, which gives interesting information as to practices current at its date :—

Unto the Right Honourable the Lord Chief Baron and Barons of Exchequer.[2]

The
MEMORIAL OF WILLIAM MCNAB,
Curator of the
ROYAL BOTANIC GARDEN, EDINBURGH.

Humbly sheweth

That the Memorialist before he came to his present situation was Foreman at the Royal Botanic Garden at Kew a situation of very great trust and which the Memorialist was so fortunate as to fill for eight years to the entire satisfaction of his superior Mr. Aiton head gardener, whose abilities and knowledge are well known, and who is entrusted not only with the gardens at Kew which are reckoned to contain the finest collection of Plants in Europe, but also with the superintendence of those of Kensington and some other of the Royal residences.

The Memorialist during the last five years he was at Kew had a salary of one hundred guineas per annum and a House firing and candles, and the use of an excellent Botanical Library with some other advantages, and as he was so fortunate as to possess the good

[1] "A Treatise on the Propagation and Cultivation and General Treatment of Cape Heaths in a climate where they require protection during the winter months." By William McNab. Edinburgh, Thomas Clark, 38 George Street, 1832. Of this work the Hortus Woburnensis says (p. 277)—"contains the most valuable instructions that has ever yet appeared in print on the subject, and ought to be in the hands of every cultivator or admirer of *Ericeæ;* it is rendered doubly valuable by its coming from the pen of one who is generally known to be one of the best practical *Botanists* and most successful cultivators in Britain, and whose Heaths are actually grown to the size of small *trees*, and many of them all covered, from the edge of the pots to the extremity of the plants, with beautiful blossoms."

[2] Miss M'Nab has kindly shown me this Memorial and allowed it to appear here.

opinion of Sir Joseph Banks and some other distinguished Botanists he was entitled to expect when he left the Royal Gardens a more advantageous situation.

In 1810 the late Dr. Rutherford applied to Sir Joseph Banks to recommend a proper person to take charge of the Royal Botanic Garden at Edinburgh and in consequence of his recommendation the Memorialist was desired to become Curator of that garden and the Memorialist understood that some arrangements were likely to be made relative to the garden which would make it a desirable situation.

The Memorialist with this view came to the Edinburgh Botanic Garden for a salary of fifty pounds per annum with House fire and candle and two shillings and sixpence from each Botanical student, which on an average comes to from £14-£15 per annum.

The Memorialist has no ground or vegetables for his family use.

The Memorialist continued nine years at the above salary and last year he had an addition of ten pounds in consequence of a promise made to him by the late Professor and it may be mentioned that the Memorialist has had much more work personally to perform here than he had reason to expect on account of the small number of workmen employed. He has had to work hard with his own hands in order to keep the garden and the collection of plants in a respectable state in doing which being frequently exposed to sudden heats and colds in the Hot-houses he has materially suffered in health.

The Memorialist is also exposed to much unavoidable expence solely for the benefit of the garden and for which he has at present no means of being reimbursed, in entertaining in his own House various correspondents in the line of professional gardeners and those in similar situations and circumstances in life with himself who visit the garden and from whom the Memorialist receives important plants and seeds for the use of the garden and to whom some attention is therefore due. Altho this is done in the most economical manner yet it is very severely felt by the Memorialist. He would not be exposed to this expence were it not with the view of getting additions of plants and seeds for the garden, which the Memorialist can shew have been very considerable within these later years as well from the Books which he keeps in the garden for registering the plants and seeds which are received, as from the plants themselves which are now growing in the garden.

The Memorialist is also at considerable expence for Botanical Books which cannot be wanted in an establishment like this. These the Memorialist has to purchase at his own expence while in most similar situations which the Memorialist has visited a small Botanical Library is kept at the expence of the Establishment and where the Curator has no occasion himself to purchase botanical Books. In Oxford and Liverpool this is the case.

The Memorialist has a large family to provide for and he finds that on his present income he cannot give his children the education which his situation in life would seem to demand.

The Memorialist has no means of knowing the salary and other advantages which other Botanic Gardeners may have in various parts of the Kingdom. He knows however that the Curator of the Botanic Gardens at Liverpool has 175 guineas per annum as salary with house firing and other advantages.

The Curator of the Botanic Garden at Glasgow has £90 per annum with a promise of an advance a house and a piece of ground for growing vegetables for his family and five shillings from each student who may attend the Botanical Class.

The Memorialist understands that the Curators both of the College Botanic Garden and of the Glasnevin Botanic Garden at Dublin have upwards of £150 per annum.

On these grounds the Memorialist earnestly entreats that the Right Honourable the Lord Chief Baron and Barons of Exchequer will take his case into consideration. He relinquished a situation in which he had 100 guineas per annum when he accepted that of Curator of the Botanic Garden. It is both more laborious and more expensive and he has never drawn above £80 per annum, many years less. He therefore trusts that he will receive such an increase of permanent income as shall be thought reasonable in the circumstances of the case.

WILLIAM McNAB, Royal Botanic Garden, Edinburgh.
13th January, 1820.

The Memorial is endorsed by Sir Joseph Banks, Mr. William Aiton of Kew, and supported by Mr. Kennedy of Dunure; and Prof. Graham, who had succeeded Prof. Rutherford (who died Dec. 15, 1819) as Regius Keeper, wrote in support of it at a later date, namely 14th March, 1820. It met with a favourable response. The salary was raised to £80 in 1820, and to £100 in 1822. In 1834 a further advance to £150 was given.

Tradition required that the Principal Gardener of the Edinburgh Garden should have an acquaintance with the plants of the Scottish flora. Part of his duty was the provision of specimens for the Professor's courses of instruction to University and other students in the Garden, and the wild vegetation of the neighbourhood would have to be laid under requisition for many of these in the quantities required. And then he also accompanied the Professor upon his botanical excursions with pupils as a coadjutor in guiding and instructing the students, and also as a collector of plants to add to the stock in the Garden. We have seen that McNab's immediate predecessors were, all of them, keen botanists and collectors, and he proved to be in no way behind them in his interest in the flora of Scotland. I have often heard my father speak of the enthusiasm with which

McNab pursued the search of the rarer plants on the hills of Scotland, of his untiring energy, and of his helpfulness to the young students eager to learn; and the regard in which he was held by those who were associated with him found tangible expression in a gift from some of those who had accompanied him on such expeditions. The occasion was in 1834. Prof. Graham, having with him McNab, had made excursions to Clova in 1831, to Sutherlandshire in 1832, and again to Clova in 1834, and several of those who had been at one or other or all of the excursions initiated the proposal of a testimonial to McNab.[1] The list of subscribers is an interesting one, containing names that are now familiar to all botanists as of those who have done sterling service to Botany, and I make no excuse for including it here. It runs :—

John Hutton Balfour.[2]
Martin Barry.[3]
William Brand.[4]
Hugo Tod Spalding Beveridge.[5]
William Hunter Campbell.[6]
Edward Charlton.[7]
William Christy.[8]
E. B. Field.
David Graham.[9]
Robert Graham.
Joseph Dalton Hooker.[10]
Thomas Ivory.
James Macaulay.[11]
John Melrose.

[1] "We understand that on the last night of the year a few young botanists gave a supper in Menzies' Tavern to Mr. William McNab, the talented and worthy superintendent of our Botanic Garden, and presented him on the occasion with a handsome piece of plate, in the shape of a toddy-jug, bearing an inscription expressive of their esteem for him and of their gratitude for his uniform kindness and assistance to them during their various excursions with Professor Graham among the Scottish Alps."—*Edinburgh Evening Courant*, Monday, January 5, 1835.

[2] John Hutton Balfour (1808-84). Regius Keeper of the Royal Botanic Garden, Edinburgh, and Professor of Botany. Orig. Memb. Bot. Soc., Edin.

[3] Martin Barry (1802-55). M.D. Edin. 1836. Embryologist. Orig. Memb. Bot. Soc., Edin.

[4] William Brand (1807-69). W.S. Orig. Memb. Bot. Soc., Edin.

[5] Hugo Tod Spalding Beveridge, M.D. Edin. 1841.

[6] William Hunter Campbell (1814-53). Lawyer in British Guina. Orig. Memb. Bot. Soc., Edin.

[7] Edward Charlton (1814-74). M.D. Edin. 1836. Prof. of Medicine, University of Durham. Orig. Memb. Bot. Soc., Edin.

[8] William Christy (d. 1839). Botanist in S. England.

[9] David Graham and Robert Graham. Sons, I believe, of Prof. Graham.

[10] Joseph Dalton Hooker, G.C.S.I., O.M. The only survivor. Nestor of Botanists.

[11] James Macaulay, M.D. Edin. 1838. Practitioner in London.

Giles Munby.[1]
Richard Parnell.[2]
James Ramage.
William Alexander Stables.[3]
James Stewart.[4]
Nicholas Tyacke.[5]
George Charles Wallich.[6]
Hewett Cottrell Watson.[7]
Robert Wight.[8]

That McNab should thus evoke the goodwill of young students as well as of older botanists with whom he journeyed on excursions, often in trying circumstances, is telling testimony to his capacity and personal worth.[9]

[1] Giles Munby (1813-76). Algerian Botanist. Orig. Memb. Bot. Soc., Edin.

[2] Richard Parnell (d. 1882). M.D. Edin. 1835. British Agristologist. Orig. Memb. Bot. Soc., Edin.

[3] William Alexander Stables. Naturalist in North Scotland.

[4] James Stewart. Orig. Memb. Bot. Soc., Edin.

[5] Nicholas Tyacke (1812-1900). M.D. Edin. 1836. Practitioner in Chichester. Orig. Memb. Bot. Soc., Edin.

[6] George Charles Wallich (1815-1899). M.D. Edin. 1836. Marine Biologist. Orig. Memb. Bot. Soc., Edin.

[7] Hewett Cottrell Watson (1804-1881). Botanical Geographer.

[8] Robert Wight (1796-1872). M.D. Edin. 1816. Indian Botanist.

[9] Here is McNab's letter of acknowledgment :—

Royal Botanic Garden,
Edinburgh, Feby. 14th, 1835.

Sir,—I have taken the liberty of acquainting you that I have this day received from Messrs. Mackay and Cunningham the *Toddy Jug* with the addition put to the inscription of the names of those gentlemen who have conferred on me this high honour, and also an appendage to the Jug of a very handsome *Toddy Ladle*.

Permit me through you to express to those gentlemen my sincere and warmest thanks. When I accompanied you and the other gentlemen in the excursions to the North I was only performing part of my duty, and to have merited in any way their approbation was quite as much as I could have expected, but I am quite at a loss for words to express my gratitude for this distinguished mark of kindness. I can only say that I thank you most truelly, and should it ever fall to my lot and be in my power to be of use to any one of the party, my service will be most freely at their command, and may long life and prosperity attend you all, shall ever be the earnest wish of,

Sir, With the Greatest Respect,
Your Obedient Humble Servant,
(Sgd.) WILLIAM MCNAB.

To Dr. Balfour.

Busy man though he was, McNab evidently found time to carry on, like other collectors of the period, an exchanging correspondence with Mr. N. J. Winch, as we learn from two letters, now in the Winch Correspondence at the Linnean Society, which I add here by permission of the President and Council; but from their tenor we may gather McNab found that the demands made upon his time and energy by other avocations only allowed of fitful interchange. The letters are, however, interesting as showing that McNab was no merely empirical gardener.

William McNab to N. J. Winch.[1]

Botanic Garden, Edinr., 13th April, 1818.

Sir—In April 1816 when I had the pleasure of receiving a letter from you, I was at that time much engaged with the concerns of the garden, which prevented me attending to its contents at the time, and soon after I got into a very bad state of health which for a long time prevented me even from attending to the necessary affairs of the garden. I am however now thank God, got pretty well again, and I have now sent you a few specimens which you will receive with this, I am sorry to say that you will find but few of those mentioned in your desiderata list, however they are all that I can at present furnish you with, you will find a considerable number of Grasses, and some other chiefly Foreign Plants, which I hope at least a part of these will be acceptable to you.

I have to return you my best thanks for the Copy of your Northumberland Flora, which you had the goodness to send me, on the other side is a list of a few plants, which I wish specimens of, if you can furnish me with any part of them I shall be particularly oblidged to you for them.

As I have not hitherto pay'd any attention to the Cryptogamia, and have none of them in my Herbarium, I shall be particularly obliged to you if you could send me a few, if ever so common, of the *Musci*, *Hepaticæ*, and, *Algæ*, and what I have from you I know I may depend on being correct; and I shall endeavour to make you a suitable return so far as is in my power,

and I am, Sir,

Your very Humble Servant,

(Sgd.) William McNab.

[1] Printed by permission of the President and Council of the Linnæan Society.

Wm. McNab Desiderata List.

Schœnus Mariscus
Scirpus pauciflorus
Bromus racemosus
Radiola Millegrana
Chironia pulchella
„ littoralis
Ribes spicatum
Pyrola minor
Rosa scabriuscula
Orchis Morio
Ophrys muscifera
„ apifera
Malaxis paludosa
Cypripedium Calceolus
Zannichellia palustris
Myriophyllum spicatum
Equisetum fluviatile
„ limosum
Aspidium lobatum
Cyathea dentata
Schœnus fuscus
Scirpus carinatus
Alopecurus fulvus
Festuca decidua
Holosteum umbellatum
Polycarpon tetraphyllum
Centunculus minimus
Statice reticulata
Scheuchzeria palustris
Bartsia alpina
Limosella aquatica
Carex Davalliana
Aspidium fontanum
„ spinulosum
Asplenium alternifolium
Cyathea incisa

William McNab to N. J. Winch.

Botanic Garden, Edinr., 28th June, 1823.

Sir,—I rec'd yours of the 31st May, but having had so much to attend to since that I really have not had time to pay much attention to your request, however I hope I shall be able to help you to a few of the Saxifragæ that you want, so far as I am able to judge I think Mr. Donn's Monograph is the best on the Genus I have seen—but in a genus like *Saxifraga* where there are so many garden made species, it must always be difficult to clear up,

and I am, Sir,

Your very Humble Servant,

(Sgd.) William McNab.[1]

[1] To the end of his life McNab was a keen collector of plants, especially those of interest horticulturally. I find in a notebook—which Miss McNab has kindly presented to the Botanic Garden—of records of plants added to the Garden the following note of "Roses collected with Mr. Sabine, 14th October 1845":—

Rosa canina: or new sp.	in a field south side road opposite Red Hall.
„ *villosa*	
„ *Donneana*	on bank north side of road going down to Red Hall Barley Mills in wood below the road.
„ *heterophylla*	
„ *sp.* near last	
„ *spinosissima*	
„ *tomentosa*	at corner of clump of trees west from Sclateford and below last.
„ *villosa*	
„ *sp.* like *canina*	on footpath between Red Hall Barley Mills and Sclateford.

We obtain some idea of the general respect which William McNab inspired and of the esteem in which he was held from the demonstration in his honour which took place in 1844. The following circular shows its initiation :—

M'NAB TESTIMONIAL.

AT a preliminary Meeting, held here on the 24th July, of Gentlemen interested in the promotion of Botany and Horticulture, it was unanimously agreed, That to Mr WILLIAM M'NAB, the distinguished Curator of the Edinburgh Royal Botanic Garden, this country is especially indebted for the eminent progress which it has made in the science and practice of Gardening.

More than thirty years ago, Mr M'NAB was called to Edinburgh from the Royal Gardens of Kew, where, under the eye of his Majesty George III. (who took a warm interest in his labours), he held a similar charge. When it became necessary to transfer the Botanic Garden to its present locality, Mr M'NAB displayed remarkable skill in his arrangements for that purpose—particularly in the successful removal of trees, shrubs, and plants, to their new situation—some of them of large size, and probably 100 years old. During his whole career, Mr M'NAB has pursued a steady and unobtrusive course of observation and experiment, with regard to the rearing of Exotics from all quarters of the globe; and that he has been pre-eminently successful in this department, the Botanic Garden, in its present state, furnishes ample proof. He has also, by useful publications (particularly those on the cultivation of Cape Heaths, and the Transplanting of Evergreens), made known to others both the nature and results of his practice; and his numerous pupils have not failed to disseminate widely the lessons they were taught. Indeed, by the strict order and undeviating regularity which he has ever both displayed and enforced, Mr M'NAB may be said to have organised a new school of Practical Gardeners; while his kindly encouragement of merit, wherever it appeared among his assistants, and his unwearied attention to every request for advice or aid, whether from operative or amateur Horticulturists, has made him as universally esteemed as he is extensively known.

It was therefore proposed, and cordially responded to, that a Fund should be raised, by general subscription, with the view of presenting to Mr M'NAB such a Testimonial of gratitude for his

Rosa Borrerii —roadside near Hale.
,, *villosa?* —between Hale and Collington.
,, *involuta* —Collington Churchyard.
,, *villosa?* —by side of mill-lead near Coltbridge.
,, *rubiginosa*, ,, *villosa* —Caroline Park and Cramond.

and then collected on 19th October 1845 :—

Rosa new sp. —roadside near Dryden Burying-ground.
,, *caesia?* —south end of coal-pit near Cockpen Church.
,, *arvensis* —from Tynningham woods (received from Mr. Sabine).

valuable services, and of respect for his very estimable character, as may both cheer himself in his declining years, and excite others to pursue the same honourable path which he has trod—by shewing that meritorious labours, even in one's ordinary vocation, seldom fail of being sooner or later duly appreciated.

Until the amount of Subscriptions be known, it is, of course, premature to decide finally as to the most suitable mode of applying them; but the names of those who have agreed to act on the Central Committee, afford a sufficient pledge that this subject will be maturely considered. It may, however, be stated as the present view of the Committee, that, besides some complimentary offering, which may be handed down in his family, Mr M'NAB should receive a *more substantial* mark of esteem, in such form as the Committee may devise. It is also intended, after the procedure is closed, to print a brief statement of it, with a List of Subscribers, &c., of which a copy shall be transmitted to each, so as all who join in the object may possess a permanent record of it.

It may be proper likewise to observe, that, as the Subscription is not restricted to any country or class, so every one will be left to exercise his own discretion with regard to the sum he shall contribute. The willingly offered mite of the most humble labourer in Nature's field will be equally acceptable, and equally appreciated, with the ampler donation of the noble and wealthy amateur; for the gentleman whom it is designed to honour, has worked his own way to distinction, and all may appropriately unite in bearing testimony to that usefulness which never exempted any from its operation.

CENTRAL COMMITTEE.

Honourable Lord Ivory.
Honourable Lord Murray.
Sir George S. Mackenzie, Bart.
Sir James Gibson-Craig, Bart.
Sir Henry Jardine, Kt.
William Gibson-Craig, Esq., M.P.
Professor Christison.
Professor Dunbar.
Professor Graham.
Professor Miller.
Professor Syme.
Professor Traill.
David Anderson, Esq., of Moredun.
Isaac Anderson, Esq., S.S.C.
William Ballantyne, Esq., Dalkeith.
William Brand, Esq., W.S.
Rev. Dr Brunton.
Charles Cobbold, Esq.
George Dunlop, Esq., W.S.
John Gray, Esq., Greenock.
James Greig, Esq., W.S.
Dr R. K. Greville.
Thomas Handasyde, Esq., Nurseryman.
Eagle Henderson, Esq., Nurseryman.
Henry D. Hill, Esq., W.S.
Dr T. C. Hope.
Holmes Ivory, Esq.
William Keith, Esq., Accountant.
Charles Lawson, Esq., Nurseryman.
George Logan, Esq., W.S.
Mr Charles M'Intosh, Dalkeith Park.
Dr Douglas Maclagan.
John S. More, Esq., Advocate.
Stewart Murray, Botanic Garden, Glasgow.
Patrick Neill, Esq., LL.D.
William Richardson, Esq., Nurseryman.
Edward Sang, Esq., sen., Kirkcaldy.
Dr William Seller.
C. H. J. Smith, Esq., Garden Architect.
Andrew Symington, Esq., Merchant.
Captain Tait, R.N.
Thomas Thomson, Esq., W.S.
James Wilson, Esq., Woodville.
Alexander Wright, Esq., Nurseryman.

Treasurer to Committee,—MR WILLIAM BRAND, W.S., 4 QUEEN STREET.

NOTE.—*Communications may be addressed to the Treasurer, or to Mr Sang, Mr M'Intosh, Mr Smith, or Dr Neill—each communication having the Letters M. T. written above the Address on the outside.*

Intending Contributors are respectfully requested to transmit their Subscriptions, if convenient, along with their reply to this Circular, or soon afterwards, as it is intended to present the Testimonial in December next.

EDINBURGH, 29*th August* 1843.

A ready response was given to the proposal of the circular, and on the 14th March, 1844, a "Presentation Dinner" took place in the Café Royal, Edinburgh, under the presidency of Professor Traill, supported by many distinguished citizens. The speech of the Chairman and Mr. McNab's reply on the occasion are cited here from the *Edinburgh Evening Courant* of 14th March, 1844. Professor Traill said :—

"I have now come to the toast of the evening, and, in introducing it to your notice, I do not consider that it is necessary to make many observations. When we turn to our worthy friend who sits at my right hand, we cannot but congratulate him on the number and respectability of those who have met here to do him honour. I might say a great deal about Mr. McNab, but I know that his character and his merits are so well known, and so justly appreciated by you, that I do not require to point them out or to dwell upon them. A short history of our excellent and esteemed friend may not, however, be uninteresting to this meeting, nor uninstructive to those who would attain to the same eminent position which he holds. To trace the successive steps by which he rose to that place will serve to show what may be accomplished by indomitable perseverance, well directed industry, and unbending integrity, and may prove an example to others to follow in his footsteps."

After a summary of the chief incidents in Mr. McNab's life, of which an account has been given above, Professor Traill continued :—

"It is well known with what zeal and talent he discharged the duties of his situation, and one consequence of his too assiduous attention to these was his catching a severe cold, by which he lost his voice. It is owing to his skill and industry we are indebted for the successful transplanting of so many beautiful exotics. It is owing to him that our conservatories are now so full of the plants of other countries, and it is owing to him that Scotland has attained such a high name for its scientific horticulture. It is unnecessary for me to enlarge on what you all know so well, and so much better than myself. I will only observe that Ayrshire, which owes its glory to Burns, will have another wreath in her chaplet in the fame of McNab. I have now the agreeable duty to perform of presenting, in the name of the subscribers, the testimonials now lying before me. In the first place, we considered that it would be better that this mark of their regard should not only be valuable, but useful, and we accordingly have to request your acceptance of a draft for £400 on the Edinburgh and Glasgow Bank, enclosed in this silver snuff box. This other snuff magazine which I hold in my hand, fashioned into the form of a thistle, is from the root of a Scottish bamboo, grown by Mr. McNab in the Botanic Garden. The cane from which it was taken grew forty feet in six months, which may give some idea of what Mr. McNab can accomplish. I will ask Mr. McNab to take a snuff out of it, and hand it round for the inspection

of the company. The committee also thought it would be becoming that Mrs. McNab should participate in some measure in the testimonial, and they have conceived it proper that that lady should be presented with this silver salver, silver divider, and silver sugar basin. There is another member of Mr. McNab's family to whom the committee feel deeply indebted. This is Miss McNab—the limner of that beautiful portrait of her father, which is now before you, and a copy of which is to be presented in an engraving to every contributor. As a work of art this portrait does great credit to the talented artist. This work-box, which bears an appropriate inscription, Mr. McNab will, therefore, do us the pleasure to present to his daughter. In conclusion, I crave a bumper to the health of our excellent friend."

Mr. McNab, on rising, said—

"Professor Traill and gentlemen, you can easily conceive what my feelings must be, and how unable I am to give expression to them. You have done me an honour which I never expected, and of which I feel I am altogether unworthy. Fain would I give utterance to the emotions of this moment, but it is quite out of my power to do so. I have never been trained to public speaking, and, to make the matter worse, I have little voice left; but even if I were still possessed of the same powerful organ I once enjoyed, I could not have said anything, for the moment I begin to hear the sound of my own voice, everything flies out of my head. Your excellent chairman has been pleased to say a great deal more of my merits than they deserve. I, for my own part, have never been able to see that I have done anything more than my duty. It is true that I know the names of a great many different plants, and also know how to cultivate them, so as to make them thrive in this climate. But yet I have not learned this: how to tell a species from a variety, nor how to distinguish betwixt one genus and another. It is very true that there is a plant which has been named after me,[1] but this did not take place from any merit of mine as a botanist, though I believe it was done out of a compliment to my wanderings amongst the wilds and mountains of Scotland, when making, along with the Professor and his young friends, botanical excursions, and certainly these were not very trifling, for their range extended from Cape Wrath to the Mull of Galloway. Besides, even if my education and talents had fitted me to be a botanist, I feel I could not have entered on that field without treading on ground belonging to my superiors, which is an interference no good subject should be guilty of. For the last forty-three years I have had a considerable deal to do in recommending persons to situations of responsibility both as head gardeners and under gardeners, and my invariable advice to them has been to serve their employers well and faithfully, as being the best way to serve themselves, and in the event of their not succeeding to please, to leave the situation as soon as possible, and on such terms as would still retain them the good feeling and friendship of their employers. I have been told that every master

[1] *Macnabia*, a monotypic genus of Ericaceæ in South Africa, was named by Bentham in 1839.

whom I served during the last forty-eight years, who is still in life, has his name inscribed in the list of contributors to the splendid testimonial presented to me. This shows that I have acted on the advice which I have given to others. I am afraid to say more, but would willingly address a few words to my younger brethren on a point which my experience has given me some means of forming a judgment upon. We are all aware of the prodigious improvements which have within these few years taken place in every sphere of knowledge and business. The art of gardening has not stood still, but has progressed at railway speed, and now we have a vast number of publications constantly issuing from the press for the instruction of the scientific and practical gardener. It is said that this knowledge will enable the rising gardeners greatly to excel their predecessors, and also save them a great deal of toil and study formerly required. I warn my younger brethren against being misled by such ideas. Theory is all very well, but I can assure my young friends that they can never rise to eminence without studying as diligently and working as hard as we have done. We have now a considerable deal of knowledge as to the nature and properties of our soil and climate, but notwithstanding the numerous weather prophets and almanac-makers of our time, I never yet met with a man who could tell me what sort of a day we were to have to-morrow, or even in the course of a few hours. Now, gentlemen, I will say no more, but be assured that I feel most deeply your kindness and generosity, and as long as life lasts and memory remains, the proceedings of this day will never be effaced from my recollection."

Strenuous in the discharge of his duties in the Royal Botanic Garden, William McNab died there in harness on 1st December, 1848, when nineteen months short of three score and ten years, and after a service to it of thirty-eight years as Principal Gardener. He was buried in the new Calton Burying Ground beside his wife, who had predeceased him by four years.[1]

In the *Edinburgh Evening Courant* of 16th December, 1848, is to be found an account of the tribute to his worth expressed at the annual winter meeting of the Caledonian Horticultural Society, of which Society he was a corresponding member, as he had been, since 1820, of the similar society in London.

From 1825 he had been an associate of the Linnean Society of London. He was also an associate of the London Medico-Botanical Society, and one of the founders of the Edinburgh Botanical Society in 1836.

[1] The grave is situated about the middle of the area and is marked by a headstone inscribed: 1834 | The Burying ground of | William McNab | Royal Botanic Garden | —In memory of | Margaret McNab | daughter of William McNab | who died 11 June 1834 age 22 years | Elizabeth Whiteman | wife of William McNab | died 25 September 1844 aged 66 years | William McNab | Curator of the Royal Botanic Garden | died | December 1848 aged 69 years.

In 1826 he was the recipient of a compliment from the Tsar, the nature of which the following letter[1] explains:—

London, 16–28 January 1826.

"The Russian Ambassador having considered it his duty to inform his Court of the readiness with which Mr. McNab facilitated to Dr. Fischer the means of fulfilling the commission with which he had been entrusted in this country in the year 1824 relative to the acquisition of plants for the Imperial Botanic Garden at St. Petersburgh, and of the contributions so obligingly made in order to enrich the Professor's collection for that Establishment, has been directed to transmit to Mr. McNab a diamond ring which his late Sovereign—the Emperor Alexander, of glorious memory, had been pleased to destine for him, as a testimony of His Imperial Majesty's particular satisfaction."

Hardy and active, William McNab appears throughout his long service in Edinburgh to have been able, with but little interruption from illness, to fulfil his duties in the Royal Botanic Garden, and this notwithstanding the handicap of an affection of his voice which an asthmatic attack had inflicted upon him, and to which reference has already been made (see page 315). For more than twelve months previous to his death he suffered from lameness, the result of an accident, and during the latter part of this period he was assisted in carrying on the work of the Garden by his youngest son Thomas.[2]

[1] Printed by permission of Miss McNab from the original official document in the possession of Mr. William McNab, Montreal.

[2] As the following letter tells:—

Royal Botanic Garden, Edinburgh,
9th January, 1849.

I have had the pleasure of being acquainted with Mr. Thomas McNab for some time during which I have had many opportunities of observing his excellent acquirements and the zeal and ability with which he discharged the duties committed to him. In a period of ten months he assisted his father in the Botanic Garden here, and for some months before his father's death he had the principal charge of the practical arrangements, and he acquitted himself entirely to my satisfaction. He gave me very able assistance during my course of lectures last summer, and he prosecuted the study of Botany with assiduity and success.

He has devoted his attention in a particular manner to Agriculture. While in the service of the Assam company he enjoyed opportunities of observing the cultivation of plants in India.

He possesses regular business habits, and his deportment has been at all times respectful and pleasing.

From all I know of his talents, his scientific information, his knowledge in business and his moral conduct, I consider him well qualified for the office of Factor for which he has announced himself as a candidate.

(Sgd.) J. H. BALFOUR, M.D.,
Professor of Medicine and Botany
in the University of Edinr.

—*By permission of Miss McNab from the original letter now in the possession of Mr William McNab, Montreal.*

The portrait I am able to attach to this notice is from a photograph in the possession of William McNab's granddaughter, to whose kindness I am indebted for the privilege of having a copy from which our reproduction has been made. Miss McNab writes—"I send you herewith one of the copies of the old photograph of William McNab which Moffat has done for us. I think it has lost a little in the process. I showed this portrait to some friends who could remember my grandfather, and they thought it was not 'austere' enough looking. Certainly the eyes are not so keen as in the old faded original, but I think the likeness is better than the engraving from the chalk portrait by my aunt Mrs. Jackson." Unquestionably the portrait reproduced here gives one an impression of the strong character of the man better than that obtained from the copy of Mrs. Jackson's drawing.

William McNab married, when he was at Kew, probably in in 1808, Elizabeth Whiteman (d. 25th September, 1844), third daughter of Joseph and Judith Whiteman, London, and had a family of nine children.[1]

Of this family, the oldest son James, who was born in 1810, prior to McNab's appointment to Edinburgh, succeeded his father in the Royal Botanic Garden, and is second only, if that, to his father in horticultural renown. Of him mention will be made hereafter in these "Notes."

The second son, William, settled at Geelong, in Australia, where he must have taken part in public life, for we learn from an advertisement in an Australian paper that he was Secretary of the Barrabool District Road Trust. He died in Australia.

The third son, Gilbert, born 20th November, 1815, at Edinburgh, graduated M.D. of the University of Edinburgh in 1836, submitting a thesis "On the Botany of the Coast of Forfarshire."

[1] Catherine Mary—*b.* Richmond, Surrey, 13th Feb., 1809; *d.* 1857.
James—*b.* Richmond, Surrey, 25th April, 1810; *d.* Edinburgh, 19th Nov., 1878.
Margaret—*b.* Edinburgh, 10th March, 1812; *d.* 11th June, 1834.
William—*b.* Edinburgh, 10th Dec., 1813; *d.* Australia.
Gilbert—*b.* Edinburgh, 20th Nov., 1815; *d.* St. Ann's, Jamaica, 21st Jan., 1859.
John—*b.* Edinburgh, 1st Sept., 1817; *d.* Edinburgh, 21st August, 1818.
Elizabeth—*b.* Edinburgh, 23rd May, 1819.
Jennet—*b.* Edinburgh, 10th Feb., 1821.
Thomas—*b.* Edinburgh, 4th January, 1824; *d.* Canada.
—Compiled from data furnished by Miss McNab.

He was an active botanist, and, after acting as assistant in the laboratory of Professor (afterwards Sir Robert) Christison, he went in 1838 to Jamaica, where he took up medical practice at St. Ann's.[1]

From Jamaica, Gilbert McNab sent to Britain considerable collections of dried plants. He died in Jamaica on 21st January, 1859.[2]

Thomas, the youngest son, was in Assam in early life, and, as we have seen, had returned at the close of his father's life. He subsequently settled in Canada, and his descendants are now prominent citizens in Montreal.[3]

[1] The following extract from the *Edinburgh Evening Courant* of 30th December, 1837, tells of a pleasing ceremony in Edinburgh before he left:—

DR. GILBERT MCNAB.—This excellent young man, we find, is about to leave Scotland, and to settle down a medical practitioner in Jamaica. In contemplation of this circumstance he was invited by the resident members of the Edinburgh Botanical Society to meet them at supper in Barry's Hotel on Wednesday last, 27th ulto. Professor Graham, President of the Society, was in the chair; Professor Christison, one of the vice-presidents, acted as croupier, and besides a large proportion of the resident members, several of Dr. McNab's friends, not members of the Society, were present, anxious to pay any compliments in their power to one so universally respected. The party was therefore a very large one, and among them were Mr. Lindsay Carnegy, Dr. Neill, Dr. Walker Arnott, Dr. Greville, Dr. Peebles, and many other individuals whose greetings upon this occasion were as honourable, as they must have been gratifying, to him in whose success in life they had come, some of them from a distance in the country, to express an interest. In the course of the evening the progress of Dr. McNab, even from his boyhood, was traced, and unanimous testimony borne to the fact that in no situation as a schoolboy, as a pupil of the University, a candidate for his Degree, an assistant in the Clinical Wards of the Infirmary, a most efficient member of the Botanical Society, a son, or a friend, had he ever made, in a matter of the smallest consequence, one false step. Dr. McNab will leave the country assured of the warm attachment of a large body of friends, who entertain the most sanguine anticipation of his speedy advancement to great professional eminence and to merited scientific repute.

[2] A short biographical notice of Dr. Gilbert McNab appears in the Trans. Bot. Soc. Edin. (1860).

[3] The following testimonial shows that in Canada his aspirations were horticultural:—

Royal Gardens, Kew,
Oct. 5th/71.

I have great pleasure in stating that I was well acquainted with Mr. Thomas McNab in his youth, when myself a resident in Edinburgh and doing duty daily in the Royal Botanic Gardens there as protempore lecturer for the late Professor Graham (Prof. of Botany). At that time Mr. McNab's father was Curator of the Gardens and himself a young man of industry, ability, and good understanding, of excellent moral character, and under training of his father for the practice of gardening, especially landscape gardening.

I have reason to believe that Mr. Thomas McNab did full justice to his father's

Of the daughters, Catherine, the eldest, published in 1850–51 a book on "Botany of the Bible." The youngest, Janet, who made the sketch from which was taken the only portrait hitherto published of her father, married Mr. George Jackson, nurseryman, a member of the firm of Messrs. Thomas Jackson & Sons, of Kingston-on-Thames.

The esteem in which William McNab was held survived his death and found expression in a proposal to erect in the Botanic Garden a monument to him. The following is a copy of a circular issued in connection with the scheme :—

At a Meeting of a few Friends and admirers of the late Mr. William McNab, of the Royal Botanic Garden, Edinburgh, it was unanimously resolved, That a Subscription be set on foot for the purpose of erecting a Monument to his memory,—to be placed among the living monuments of his skill and industry, in the Garden where he so long and so successfully laboured,—should permission be granted to do so.

Mr. McNab's merits as a Gardener and a Botanist were so universally known and appreciated, that it is unnecessary to dwell upon them here ; while the high estimation in which he was held by all who enjoyed the pleasure of his acquaintance, and especially by his Professional Brethren, by whom he was long and justly regarded as the Father of the Profession,—fully warrants the hope that the present proposal will be cordially responded to.

Until the amount of Subscriptions be known, it will of course be premature to decide finally upon the nature and extent of the proposed Monument ; but the names of the Gentlemen who have already agreed to act on the Committee, afford a sufficient guarantee that the views of the Subscribers will be carried out in the most appropriate manner.

Interim Committee.

Professor Balfour.
Professor Pillans.
Professor Traill.
Professor Fleming.
Dr. Neill, Canonmills Cottage.
Dr. Greville, 33 George Square.
John Ballantyne, Dalkeith.
John Carstairs, 8 Howe Street.
Hew Crichton, S.S.C.
William R. Dickson, 1 Waterloo Place.
William Girdwood, 2 Bank Street.
James Greig, W.S., 32 Hanover Street.
Thomas Handayside, Fisherrow.
Eagle Henderson, 81 George Street.
Charles Lawson, 1 George IV. Bridge.
Dr. J. T. Mackay, College Botanic Garden, Dublin.
Stewart Murray, Glasgow Botanic Garden.
Charles M'Intosh, Dalkeith Palace.
Edward Sang, senior, Kirkcaldy.
John Smith, Royal Gardens, Kew.
Alexander Wright, 1 Greenside Place.

William Brand, W.S., 5 Northumberland Street, *Treasurer.*
William W. Evans, Experimental Garden, *Secretary.*

training, and have no reason to doubt but that he is well qualified for the duty of Keeper of Montreal Park. I should add that the late Mr. McNab's position and character were of the highest and in themselves no trifling warrants of the probable abilities of his sons. (Sgd.) JOSEPH D. HOOKER, Director.

—By permission of Miss McNab from the original letter in the possession of Mr. William McNab, Montreal.

The circular is undated, but as Dr. Neill was one of the Interim Committee the issue must have been before 1851, in which year Dr. Neill died. Nothing came of the movement. I have the impression that the Committee failed to obtain the consent of the Crown to the placing of a monument in the Garden.

APPENDIX A.

HINTS | ON THE | PLANTING AND GENERAL TREATMENT | OF | HARDY EVERGREENS | IN | THE CLIMATE OF SCOTLAND, | Particularly the following:— | Strawberry Tree (Arbutus Unedo), | Common Holly (Ilex Aquifolium), | Common Laurel (Prunus Laurocerasus), | Portugal Laurel (Prunus lusitanica), | Alaternus (Rhamnus Alaternus), | Laurestine (Viburnum Tinus):— | By WILLIAM McNAB, | Superintendent of the Royal Botanic Garden of Edinburgh; | Associate of the Linnean and Medico-Botanical Societies of London; | Corresponding Member of the Horticultural Societies of | London and Edinburgh, &c. | EDINBURGH: | THOMAS CLARK, 38 GEORGE STREET. | MDCCCXXX.

The plants enumerated in the title of this paper are only a few of the hardy evergreens that are cultivated in Scotland; but I am convinced, from long experience, that any person who successfully plants and cultivates them may cultivate almost any other hardy evergreen with equal success.[1]

It is unquestionably true that evergreens are cultivated in Scotland much more sparingly than good taste would dictate. Everyone capable of enjoying the beauties of rural scenery must regret this, and in proportion to such regret will be his desire to see the evil corrected, which is the sole object of the present essay. But, in order to correct this evil, it is necessary, in the first place, to refute certain prevailing errors which, as I apprehend, constitute its cause. I am persuaded it cannot generally be attributed to unconsciousness of the defect and consequent carelessness about having it remedied; for I have seen, with regret, many instances where failure attended anxious endeavours to cultivate evergreens on a very respectable scale.

There are other reasons than those of good taste alone which would lead to the cultivation of evergreens in large quantity, were the certainty of their successful cultivation, which I am now to demonstrate, better understood. They furnish admirable shelter for game of every description, and there are few followers of the hounds who would not willingly draw a laurel alternately with a gorse cover. Even the value of some evergreens, as a crop, is enough to secure for them attention; and, if there be any landed proprietor who can look with indifference at the beauty of a

[1] I wish it to be understood that, in speaking generally of evergreens, I do not include the Fir tribe.

plantation interspersed with underwood of well-selected evergreens, he may, notwithstanding, kindle with eagerness at the contemplation of the price which would be paid for some sorts on account of their value in various arts. It is not, therefore, because there is no motive for their cultivation that evergreens are neglected in Scotland, nor because those motives are unappreciated. Is it because our soil or climate is not adapted to their constitutions? This is a very common error, but that it is an error will be very easily shown. I will venture to assert that there is not in a more thriving state in any district of Britain a collection of evergreens of such variety and extent as that in the Royal Botanic Garden of Edinburgh, nor one which has made a better appearance in so short a time after planting.

Every person in Scotland who takes the least interest in such questions must recollect having seen in many districts splendid examples of evergreens which would do credit to any soil or climate; and very rarely indeed do any of the species named in the title of this paper suffer materially from our severest winters. No doubt I have seen the common laurel cut down to the ground in some parts of Scotland from the intensity of the frost, and the Portugal laurel and laurestine have been known to meet the same fate; but this very rarely happens, and perhaps never, except in inland parts of the country and in situations which are low and damp. I apprehend the principal cause of the scanty culture of evergreens in Scotland may be found in circumstances more discreditable to the Scotch cultivator than an indifferent soil or climate, but which are fortunately more susceptible of remedy; and I am not without hopes that a due consideration of the cause may tend, in a great degree, to put the matter on a right footing.

I have had considerable experience in the planting of hardy evergreens of all sorts and various sizes, indeed perhaps greater experience than generally falls to the lot of practical gardeners. This experience has been gained under the eye of the public, and I believe I have obtained a degree of credit for success equal to any of my brethren in the profession; at least, I am not aware that I have been censured for want of success in what I have attempted; and, as times go, if a man in a public situation, acting under the public eye, escapes censure, it may, I presume, be fairly inferred that he does not deserve censure. As I am quite persuaded that the chief cause of failure in the cultivation of these most ornamental plants proceeds from the uncontradicted promulgation of certain instructions regarding the season and manner of planting, which are, indeed, reiterated by almost every author who treats on the subject, and the too ready compliance with these instructions, I am not without hope that a few hints derived from the practice I have had may be useful to the gardener whose only experience has been in acting under such instructions. Should I be fortunate enough to express intelligibly my ideas upon this subject, and intelligibly to detail my practice, and if that practice shall be followed, I doubt not we may soon see evergreens in far greater abundance than heretofore in the pleasure-grounds of noblemen and gentlemen, and

even as underwood in extensive forests; for I cannot permit myself to imagine that it is either the want of taste or of climate, neither is it the unsuitableness of soil, which has prevented their abundance hitherto.

I do not, however, mean to insinuate that the injudicious management of the gardener is the sole cause of evergreens being found in much smaller numbers and in much less perfection than could be wished. On the contrary, I wish it to be understood that I believe many gardeners know as well as I do how to plant, and how to treat these essentials in a fine landscape; various causes interfere to put it out of the power of the gardener to plant at the proper season, or to bestow that attention which they absolutely require to establish their health.

I am anxious, however, to show that without a certain degree of attention and a proper selection of season it is only a waste of time and of money to make the attempt, in order that, where circumstances can admit of it, attention may be given to details, which I know will ensure success.

Much has been said of late about the ignorance of Scotch gardeners, particularly in a work written by Sir Henry Steuart, entitled, "The Planter's Guide," to which someone has written an answer in a pamphlet under the title of "Strictures on Sir Henry Steuart's Planter's Guide, by a Planter of some Experience."

I think this defence of the profession by the author of "Strictures" was unnecessary. Sir Henry is very unmeasured in his censure, but a libel is innocent when it is notoriously overcharged.

I am somewhat interested in this controversy, in so far as Sir Henry has taken from me all the credit of our success in transplanting the trees from the old Botanic Garden and transferred it to Dr. Graham. But this excites in me no degree of anger, because Sir Henry at the same time attributes this success chiefly to the circumstance of Dr. Graham having, at his (Sir Henry's) suggestion, adopted the *previously unheard-of expedient* of cutting the roots round the plants sometime before transplanting, though before "The Planter's Guide" was written I most distinctly recollect hearing Dr. Graham say that he told Sir Henry that neither he (Dr. Graham) nor I claimed any merit for inventing what every schoolboy knew, and that in point of fact I had prepared the roots of a number of the transplanted trees in the spring of 1819, before Dr. Rutherford's death, and, consequently, before the present Professor of Botany had anything to say in the matter.

These statements Dr. Graham has made so often, both in his lectures and in private conversation, that I am sure they are generally known; and, therefore, an assertion that I was ignorant of this fact, till I got my information, at second-hand, from Sir Henry, gives no sort of uneasiness.

With regard to the charge of ignorance brought by Sir Henry against practical gardeners, much will depend upon his definition of this word. If by ignorance is meant a want of scientific knowledge, of which Sir Henry makes no little parade, I must at once admit the justice of it. But if he interprets it into a general want

of practical knowledge of our varied profession, that is a point I am not disposed so readily to concede; for, even with regard to Arboriculture, a branch which Sir Henry seems to think he has made peculiarly his own, I am not prepared to yield the palm to him, and there are, I am convinced, many other practical men who are more than his equal in a knowledge of that branch of the art. But leaving the decision of this matter to competent and disinterested judges, there are many things in regard to which Sir Henry's science might have been better employed than in scattering calumnies against a class of men who, until he chose to stigmatise them, possessed, and, notwithstanding the *fearful weight* of Sir Henry's *testimony* against them, I will dare to say, still possess, a tolerable reputation all over the three kingdoms. With all my admitted ignorance of science, I flatter myself I have not been altogether an inattentive observer of the operations of nature, some of which, when I could discover their *rationale* have been useful to me. But there are not a few, the causes of which are to me wholly unknown, which, if rightly explained (and a proper application of science might, perhaps, effect this), would afford much gratification to the inquiring minds of ignorant gardeners, and might be of great practical use. I shall here notice some of these, regarding which I can answer for myself, and I think I may say also for my brethren in the profession, we would rejoice, and with gratitude, over any information which Sir Henry's science may afford us.

In walking through the Botanic Garden (not having been at Allanton, I can only guess that such things may also be seen there), I occasionally come to two evergreens of the same species, of equal age, planted out within the same hour, treated precisely in the same manner, growing in the same soil, and which, in fact, had never been ten feet removed from each other, since, as cuttings, they were severed from the same bush, and I observe that one of them is nearly twice the size of the other, and yet both appear equally healthy. Now, how this happens, I admit myself to be profoundly ignorant.

I also frequently observe in the Botanic Garden two neighbouring evergreens of the same species, which have arrived at the same age, under similar circumstances; in the one, every leaf is entire, green, and healthy; while the half of every leaf of the other is brown, withered, broken, and dead—why, I do not know.

In the same walk of the garden I have seen two evergreens, both exotic and natives of a warmer climate than ours, from the same field, in the same country, treated precisely in the same way in this, the one enduring with impunity sharp frost, the other losing nearly all its leaves, and the tips, at least, of its branches, whenever the thermometer falls a few degrees below the freezing point. The cause of this peculiarity of constitution is another instance of my admitted ignorance.

Farther, after a sharp frost of some duration, I find another enigma in the operations of nature within the same ground, which makes me feel, and I here readily acknowledge, my ignorance. Two exotic evergreens, of different species, close beside each other, and

similarly exposed, have suffered very differently; in the one, all the young wood is killed, but the old wood of the stem and branches is perfectly sound, and quite in a condition to push out abundance of healthy shoots in spring. In the other, the bark on the old wood, everywhere above the surface of the ground, is torn, peeled, and dry, and the plant, therefore, irrecoverably dead, yet the young wood at the tips of the branches, and even the leaves covering them, though totally unprotected, are all alive, have sustained not the slightest injury, and, if taken off, will form healthy thriving cuttings. I cannot even form a tolerable conjecture as to the cause of this difference of effect on plants, which, though of different species, are, to all appearance, both in habit and structure, extremely similar.

Another thing I observed in the Botanic Garden, in the beginning of April, 1828, which I find most difficult to explain. Early in February of the same year, some evergreens having been taken from a thickly shaded plantation, immediately upon the north side of a high wall, where certainly they could not have seen the sun for several months, and where they grew in rather damp soil, were planted in an exposed situation, and in very sandy soil, by the side of similar species, which had not been moved for several years. Both looked perfectly healthy; but in March a severe drying frosty wind set in, and, I think, every one would have expected that the plants which had been lately moved would have suffered most, yet they escaped without a leaf being injured, though, from the situation in which they previously grew, they must of necessity have been destitute of all "prerequisites and protecting properties"; but their neighbours, which had occupied their ground for years, were all more or less injured, having their leaves, or great part of them, destroyed, and the points of many of their youngest shoots killed.

My next puzzle I must state upon the authority of another—I certainly know no parallel instance myself. In the *Gardener's Magazine*, Vol. V, p. 669, we are told that on the west coast of Scotland (the particular place is not named) the *Digitalis canariensis* "is one of the hardiest plants we have, and ripens its seeds abundantly, retaining its verdure throughout the severest winter, and is, indeed, quite an evergreen shrub."

Now, supposing the fact to be so (for, be it recollected, I by no means state it on my own authority), I think it most extraordinary; for I know well that, on the east coast of Scotland, a degree of frost, much less than occurs in any part of the west of Scotland which I have been in, is sufficient totally to kill the *Digitalis canariensis;* and it is utterly incomprehensible to me how, on the west coast, this plant has acquired a power of resisting cold which I know it does not possess here.

These, and a multitude of other examples of admitted ignorance, might be quoted against Scotch gardeners, and we must be content to bear the imputation, suspecting all the while, however, that we are not very singular. These, and a thousand similar instances, it does seem to me, form the difficulties with which it is the province of "science" to grapple; and he who shall solve them may, in

justice, without egotism, without the risk of being laughed at for arrogating to himself and to his subject more importance than they deserve, and, certainly, without running the risk of a charge of plagiarism, claim for himself all the merit of an original discoverer.

Without, however, such lofty pretensions, we may all be useful. The art of the gardener and forester is an important, and it is a multifarious one. We cannot each of us do everything; some of us have a reputation for succeeding in one department, others are most successful in another, and some of us could at one time do what we afterwards very generally fail in, and are compelled to admit that *we hae tint the gate o't.*

> "One science only will one genius fit;
> So vast is art, so narrow human wit,
> Not only bounded to peculiar arts,
> But oft in those confined to single parts."

I have sometimes heard men say they were equally expert at everything; but it is not an unfair rule which places these actors of all work at least as low as their neighbours. When we confine ourselves, however, to the particular departments in which we have had unusual experience, we may very often do good in our generation by making known the little improvements which our own blunders and the observations of those of others during their operations have suggested. Upon this principle, then, Sir Henry Steuart's "Planter's Guide" has really been a boon to the public; and upon the same principle, perhaps, these much more humble "Hints on Planting Evergreens" may be of useful application. Much credit is undoubtedly due to Sir Henry; for it does appear from his book that, at great expense, and by the accumulating experience of years, he has at length acquired the power, though in very unpropitious circumstances, of applying, with much greater success than they did, the directions of our grandfathers for transplanting trees; and I think it is equally certain, their operations have in the detail been, in some circumstances, improved.

But it is now time, perhaps more than time, that I should turn to the proper object of this paper.

The seasons already recommended by different authors for planting evergreens are very various. In general, however, we find that the popular directions is to plant early in autumn or late in spring, that is, in August and September, or in the end of March, in April, or early in May.

Miller, in speaking of the common laurel and Portugal laurel, says, "When a large plantation of laurels is intended, the work of transplanting may be done at any time during winter, when the weather will permit, but October is the best season."—*Martin's Edition of Miller's Dictionary.*

The same author says that the "best season for transplanting *Arbutus* is September"; "*holly*, in autumn, in dry land, but in cold wet soil they may be transplanted with great safety in spring"; "*laurestine*, Michaelmas is the best time; they may also be

removed in spring with balls of earth, or in the end of July or beginning of August, if rain should happen at that season;" "*Alaternus*, they may be transplanted either in the autumn or the spring, but in dry land the autumn planting is the best, whereas in moist ground the spring is to be preferred."

The same author says, in his article on Planting—"The seasons for planting are various, according to the different sorts of trees, or the soil in which they are planted; for such sorts as the leaves fall off in winter, the best time is the middle or end of October, provided the soil be dry, but for a very wet soil it is better to defer it till the latter end of February, or beginning of March; and for many kinds of evergreens, the beginning of April is by far the best season, though some sorts may be safely removed at midsummer, provided they are not to be carried very far; but you should always make choice of a cloudy season, if possible at that time of the year, when they will take fresh root in a few days, and, on the contrary, when these trees are removed in winter, during which time they are almost in a state of rest, they do not take root until spring advances and sets the sap in motion, so that many times they die, especially if the winter proves severe."

Thus Miller leaves us a little in the dark, after all, as to the best season for planting evergreens in general: he says, as above, that when a large plantation of laurels is to be made, they may be planted any time during winter, when the weather will permit, but October is the best time; but in every other passage he says spring, autumn, or summer; and in his article on general planting, he says April is the best time, and endeavours to show that winter is a bad time for doing such work.

Loudon, in his *Encyclopædia of Gardening*, on the culture of nursery trees, page 979, says,—"All the deciduous sorts may be transplanted in February, or early in March; and all the evergreens from the middle of April to the middle of May, and during the month of August."

The same author, in his *Kalendarial Index*, in the above work, recommends the end of March, April, or early in May, and last week in August, for planting evergreens; and for the month of April, in the same index, we have the following directions given:—"Plant evergreen trees, as pine, fir, cedar of Lebanon, holly, and yew, during the month, but finish planting deciduous sorts as early as possible." "Wherever the plants are to be, or have been, long out of the ground, take good care to dry up their roots by exposing them as much as you can to the sun and air; do not be nice in planting."

I cannot but think that these recommendations have, through inadvertency, been printed, because they are quite at variance with judicious instructions given elsewhere by the same author; and, as far as I am able to judge by my own experience, or from the dictates of obvious analogy, are opposed to everything like successful practice.

We are told, in Sir Henry Steuart's *Planter's Guide*, 1st edit., p. 440, that "by planting early, that is, soon after autumn, or not later

than February and March, all trees (oaks and evergreens excepted) are surprisingly benefited." Now, this experienced planter has told us the time that is improper to plant evergreens; but I am not aware that he has anywhere expressly told when the proper time is for performing such work, though I think he has left us to infer it. He gives us an instance, p. 319, of having planted some hollies in March, and some of them having died. It is fair, therefore, to conclude that March is an improper time. Indeed he says so; and if winter, February and March is a bad time. If we exclude summer, which probably he would, there is only the autumn and April and May left when such work can be done; so that we may suppose, that had he recommended any particular time, it must have been either autumn or spring, the favourite time for planting evergreens with almost everybody except myself. Now, besides the foregoing authorities, many could be quoted, all recommending nearly the same season for planting evergreens.

If we ask nurserymen what is the best season of the year to plant hardy evergreens, the answer of five out of six will be spring or autumn, or perhaps early in autumn, or late in spring. If we ask practical gardeners the same question, the same answer will be received. If we go a little farther, and ask a nurseryman to take the trouble of looking over his books to ascertain what months in the year he executes the greatest number of orders for evergreens (no matter whether the orders are directed by the gentleman or the gardener, to be forwarded at a particular time, or whether, as is frequently done, the time is left to the judgment and discretion of the nurserymen), we shall find that the greatest number of orders for evergreens stand in their books for April and May (in some twice as many as for any other time), and next to that in August and September, and very few are sent out at any other time, all showing that the general feeling is that spring and autumn are the best seasons for planting evergreens.

But there is another kind of evidence on this subject, which I value more, but which I have often in vain attempted to obtain—the evidence of experience rather than of theory. I have often asked gardeners, if they have happened to plant evergreens in August or September, in November or December, in April or May, which of his plants he found to thrive best, which to succeed worst; but I rarely can get a better answer than, "I would consider those planted in autumn as more likely to succeed best"; or, "I would expect that those planted in spring would do best"; but most express their belief that those planted in winter would do the worst.

This, however, is not at all satisfactory to me. I want facts, but find it extremely difficult to obtain them from others. I want to know from gardeners, who may have planted evergreens repeatedly in these three seasons with equal care; I want to know, from their own observations, and at the end of a year or two after planting, which of these evergreens have succeeded best, and which have done worst, but never got one to answer satisfactorily.

This, I hope, I shall be able to answer satisfactorily from my own experience before I have done with this subject. I know it will be

considered a bold step in me (I tremble when I think of it), in the face of all the authorities already quoted, and in opposition to the opinion of a great proportion of the practical horticulturists in the country, to come forward and assert that the seasons usually recommended for planting evergreens, viz., spring or autumn, are far from being the best—are, in fact, under most circumstances, the very worst season which can be selected for performing such work. I know that many will exclaim, as soon as they see this, that I am wrong; the reader is quite entitled to think so unless I shall show, as distinctly on paper as I can in practice, that I am right.

First, then, if I shall be able to show that winter is no worse a season for planting evergreens than the seasons already recommended, I shall certainly have gained a considerable point. To render this not improbable, I may recall the attention of the reader to the fact, that the seasons recommended by the different writers quoted are various, and that, therefore, the point has not been looked upon as settled, and, if still doubtful, the decision may ultimately be in my favour. It farther appears that winter planting has, in certain circumstances, been permitted by authors, but not recommended. It also appears from the above quotations that the season recommended varies with the kind of evergreens to be planted. Now, if I am right in asserting, and my experience has taught me to be confident that I am, that the evergreens I have mentioned, as well as all other hardy evergreens that I am acquainted with and have had experience in, may be planted at the same time, and even in the same day, with equal success, another material point is gained; for when large plantations of evergreens are to be made, it will be found much more convenient to get them all from the nursery at the same time, and to plant them all at the same time, rather than to get one kind in spring, another in August, another in September, another in October, and so on.

I may mention that I have planted evergreens at all seasons of the year with nearly equal success, except from the middle of June to the middle of August, and even during this period I have planted some; but unless the weather is very dull and moist, and even with such weather it is difficult to prevent the plants suffering considerably, and in many cases it is years before they recover; although, however, I have planted evergreens ten months out of the twelve with little difference in the success, yet one season has a preference over the others with me, and when there is the power of choice, I would recommend late in autumn, winter, or very early in spring; that is, any time from the middle of October till the middle of February, and in general the beginning of this period is the best; that is, from the middle of October till the middle of December, always providing that the weather and the ground are favourable; that is, supposing there is no frost, no drying wind, nor much sunshine, and that the ground is not too much saturated with wet, either from continued rain or from the nature of the soil. One of the principal things to be attended to in planting evergreens, is to fix on a dull day for winter planting, and moist day for spring and autumn planting. There can be no secret in the proper treatment

of evergreens; if there were, I should say that it is in preventing their roots from becoming dry when out of the earth; to choose moist and cloudy weather for planting; and, still better, if we had the power, by foresight or otherwise, to secure a continuance of such weather some time after they have been planted. If the roots of evergreens be allowed to dry when out of the ground in spring, it is scarcely possible to prevent their suffering considerably and showing this injury for a long period after they are planted. Now, it is quite true that we occasionally have such weather as I have said is fit for our purpose in spring, and too often even in summer, and therefore it has happened, as I have already said, that I have planted successfully during ten months of the twelve. But though we seldom can have difficulty at any season in selecting a moist day, or at least some hours in which the weather is sufficiently moist for planting, yet I know no secret by which, at any season, we can determine that, after planting, we shall for a week or more be free from sunshine; and I know, in common with everybody who has any experience in planting evergreens, that they suffer considerably if exposed to a hot sun immediately after being planted. Though I know no means by which I can divine what the weather may be some days after planting, yet we all know that in winter there is a greater probability of moist cloudy weather than at any other season; and we also all know that, even if we should be disappointed, and the weather become clear after planting, yet the sun is but a short while above the horizon in winter and has but little influence. Half a day's sun in spring or autumn will do more harm immediately after planting than a whole week's sun from morning to night in the middle of winter. If, therefore, there is no other objection to planting in winter, it is on this account the best season, for we are often days, and even weeks, without sunshine, and I have seen no instance of evergreens planted in the middle of winter, and properly treated, thriving worse than others planted in August, September, April, or May, even when these got a few days or a week of dull moist weather after planting. If, then, we are certain, which I am, that evergreens planted in winter will thrive as well as those planted in spring or autumn, under the most favourable circumstances, and if we find, as I do, that evergreens planted in winter will do much better than those planted in spring or autumn, under unfavourable circumstances, then, surely, the winter planting must be the best; for we find, at that time, that we can always plant (except during severe frosts, or in a very drying wind) with perfect certainty of success, whereas, in spring or autumn, there is great risk of failure, except we can get a few dull days or moist days after planting, and this is quite uncertain.

Now, I think I have shown that we can plant evergreens during winter with greater certainty of success than at any other time; and I am equally convinced that we can plant them with less trouble, and, consequently, at less expense, than at any other season; for, when evergreens are planted in the winter, and treated as I shall recommend, as being found to be the best, they cannot require so much water when planted; indeed, the ground

will seldom take in so much as it will do in spring or autumn. When planted in winter they will scarcely ever require any watering during the following summer, unless it should prove very dry, and unless the plants are of a pretty large size. On the contrary, if planted late in spring, they will, in general, require once watering during the summer to ensure the same success as in those planted in winter; the same holds good with those planted in August or September, as we often find the ground as dry then as at any other time of the year, so that by winter planting we ensure the same success and save labour in watering. The advantages of winter planting are so great and manifest that it seems strange they should have been overlooked. I am persuaded that it is false theory that has excited all the prejudice that exists on the subject. We are told that evergreens planted in winter can push out no roots till spring set their juices in motion, and that, therefore, while in this state of inaction, they run great risk of being killed. Now, I must take the liberty of disputing the assertion upon which this inference is founded. Winter transplanted evergreens do make roots before spring, and therefore cannot, on account of the want of them, be more easily killed. I do not mean to say that in a continued frost which lasts for months, and where the whole earth about the root is congealed into a mass, the roots of evergreens will grow; but we never have such continuance of severe frost in this country. During the winter we often have intervals of a week or a fortnight, and even sometimes three weeks, of mild weather, and in such weather the roots of many evergreens do grow. Let any person that has a few duplicates of different kinds of evergreens to spare, plant or lay them in by the heels, and soak them well with water, any time during the period I have recommended as the best for planting; let him take these same plants up again in the end of March, April, or beginning of May following, he will find they will have made a considerable number of fresh roots between the time he put them in and the time he took them up. Every nurseryman knows, that of the cuttings of some sorts of evergreens put into the ground, as is usual, in September or October, many will have made roots during the winter, as will easily be seen by taking some of them up in March, April, or May.

Since, then, we find that the roots of some plants grow in winter, why not give the plants the benefit of these roots by planting them at such a time as will afford that opportunity before the hot weather of summer comes on? For, by having such roots, they will be better able to resist injury than if they had to make them after April and May.

I do not mean to say that all the evergreens that have been planted in the Royal Botanic Garden within these few years have been planted in the winter. I have already mentioned that I have planted them at all times, as it often happened that I had not a choice of season; a considerable number of them, however, has been planted in the winter, both in the dry part of the garden and in the wet part, and all have done equally well.

One thing, which I may mention, operates very powerfully against planting evergreens in winter. No gardener, unless he has had very extensive practice in planting evergreens at all times, and knows from his own experience that they may be planted with perfect safety in winter as well as in spring or autumn, is safe to plant evergreens, except at the times generally practised and generally recommended; for if, from careless planting or other causes, part of these evergreens that he has ventured to plant in winter does not succeed, he will be blamed for the failure, as having planted them at an improper season; nay, he will perhaps blame himself for so doing. Even his own men, amongst themselves, will say, "O, no wonder master did not succeed with these evergreens, when he has chosen to plant them at a time when nobody else but himself would have thought of doing such work."

If the same gardener had planted the same number of evergreens at the times usually practised and recommended for such work, and had the same number of failures as in his winter planting, no notice probably would have been taken of the circumstance, seeing the work had been done at what is considered the proper time.

The very same thing holds good with nurserymen; for, supposing they get an order for evergreens, to be executed at the time they would recommend as the best, if they execute this order in winter, and a quantity of the plants do not succeed, they will be blamed for sending them at an improper season. There cannot be a doubt but this is what operates with nurserymen, and prevents them from sending out such orders in winter; for it is evident that it would be more advantageous to them to have their orders made up in winter, as they would be thus enabled to get their ground cleared and ready for planting; whereas, by the present practice, their own evergreens are almost always too late of being planted in spring, partly from the ground not being cleared, and from it being uncertain how many evergreens may yet be required to fill up orders.

I have no title to originality in planting evergreens in winter, nor any wish to claim it. Many examples might easily be found of evergreens having been successfully planted in winter—planted, perhaps, before I knew what an evergreen was; and it is only astonishing that some one did not come forward earlier and make this more generally known. It is needless to wander through the country to seek such examples; I already know where to find some, and I am satisfied I could find many more.

I shall take one example, which may be seen without much trouble by any one interested about evergreens, and who is in, or who may happen to visit, modern Athens in winter. I say winter; because then, I think, evergreens are seen to more advantage than at any other season. Let any one look at the evergreens in Hillside Crescent, by the side of the new London Road from Edinburgh, in front of the house of the Right Honourable William Allan, Esq., of Glen, present Lord Provost of the City of Edinburgh. They are principally Portugal laurel, common laurel, laurestine, holly, Alaternus,

and a few specimens of Arbutus, and were all planted in the months of November and December, in the year 1824, and under his Lordship's own immediate auspices, and without any other watering, even at the time of planting, but that which fell upon them from the heavens. Of many hundreds, nay, I believe, several thousands, of those evergreens planted in that Crescent at the above time, very few failures occurred; but an instance of evergreens planted in the spring of the following year will be given hereafter (p. 342), which proved nearly a total failure. Now, let any person compare the evergreens in Hillside Crescent with all the evergreens in the public squares, crescents, circuses, places, or gardens in Edinburgh, and if they are not satisfied that the winter is a good time for planting evergreens, they must at least, I think, be satisfied that it is not the very worst time that can be fixed upon. This qualified acquiescence in my opinion, is, perhaps, all that I am entitled to hope for; for, notwithstanding all that I have said about planting evergreens, and notwithstanding my belief that all which I have said is founded on common sense, and has even proved to be correct by long and extensive practice, yet many a person, from prejudice, obstinacy, or indolence of mind, will argue, what everybody says must be right; and as almost everybody says, that spring and autumn is the best time for planting evergreens, it is not likely that anything I have said, or can say, will be the means of inducing people in general to change to the time that I am satisfied, from practice, is the best for performing such work. "Errors of long standing can only experience a lingering death."

The treatment, however, which I shall recommend is nearly the same at all seasons; only in winter they may be planted with perfect safety in a dull calm day, whereas in spring or autumn a moist rainy day is preferable to any other; but where a person has not a choice of such weather, then the work should be performed in the evenings after the sun gets low, particularly in spring or autumn planting.

The way, however, in which I have treated evergreens is not so easy in all its detail, where a great extent of ground is to be gone over, but I think in three cases out of four it may easily be adopted; indeed, it may be easily done in all cases, for it is only planting ten instead of twenty, and it requires no great depth of knowledge to see that ten plants which thrive well, is better than twenty plants, ten of whom will die, and perhaps five more remain sickly for years. From what I have seen, this is by no means an unfair calculation, particularly when large-sized evergreens are got out of a nursery (but of this I shall speak afterwards), sent to a distance, planted at the usual season, and treated in the ordinary way.

Some years ago, after we had made some progress in lifting pretty large plants, both evergreens and deciduous, and transporting them from the Old Botanic Garden to the New, an amateur chose to bestow some pains upon me to teach me how to move such. He was very minute in stating the exact process he adopted, and urged me to adopt the same plan. About fifteen years before that he said he had planted twenty pretty large plants, or rather small trees

(which, I suppose, was the full extent of his practice in the art); he also told me the exact sum of money each cost in removing and planting, which I considered very moderate; but, unfortunately, he closed his narrative by saying that he did not know from what cause—he supposed the plants had not been properly taken care of after removal—but every one of these twenty died the same year they were planted, and he added, "I suppose you expect a great many deaths among yours also." Now, it will surely be better to plant only one that will thrive and do well, than twenty which will die; therefore, nothing can be more evidently proper than the rule, "Do the work well, and do the less of it."

I have already mentioned, that in planting evergreens in winter, a dull calm day answers very well, but in autumn or spring a moist rainy day is the best. I have at times been as wet planting evergreens as I have been when exposed for hours on the windy side of *Ben Nevis* in a wet day, without great-coat, and a broken umbrella.

In planting evergreens, whether in a dull day, a wet day, or a dry day, it is very necessary to keep in view the expediency of keeping the plants for as short a time out of the ground as possible; if only a few minutes, so much the better; and in all cases when it can be done, where great numbers are to be planted, we should, if possible, have some men stationed to take up the plants, others to carry them, and a third set to put them into the ground. In all seasons, situations, and soils, the plants should be well soaked with water as soon as the earth is put about the roots.* Where the water is not at hand, so that it may be easily carried or wheeled by men, a horse with a water-barrel on wheels should be used, as I am certain this will be amply repaid by the success of the plantation afterwards. As soon as the plant has been put into its place, the earth should be filled in, leaving a sufficient hollow round the stem, and as far out as the roots extend, to hold water, which should then be poured in, in sufficient quantity to soak the ground down to the lowest part of the roots; in short, the whole should be made like a kind of puddle. By this practice, which is particularly necessary in spring and autumn planting, the earth is carried down by the water and every crevice among the roots is filled. Care must always be taken to have as much earth above the roots of the plants as will prevent them from being exposed when the water has subsided. I find the best plan is to take an old birch broom, or anything similar, and laying it down near to the root, I cause the water to be poured upon it; this breaks the fall of the water, and prevents the roots from being washed bare of such earth as may adhere to them; in this way time is saved, for the water may be poured out in a full stream from a pail, a water-pot, or even from a spout or pipe in the water-

*This is universally true, but the urgency is less where the evergreens are planted in winter to form underwood in extensive plantations. In this case the deaths without watering will be so few that they are not worth avoiding at much expense and trouble.

cart or barrel, where the situation is such that this can be brought up to the plant. After the first watering has dried up, the earth should be levelled round the stem of the plant, and as far out as the water has been put on, but not trod; if the plants are large, a second watering is sometimes necessary, but in ordinary sized plants one watering is quite sufficient, and after remaining twenty-four hours, more or less, according to the nature of the soil, the earth about the stem, and over the roots, should be trod as firm as possible, and after treading, should be dressed with a rake. Where this is practised, and the planting done at the time that I have recommended, there is scarcely a chance of any dry weather afterwards injuring them; but if this method, or something similar, is not practised, there will be a great risk of failure every year, in planting evergreens, particularly when they are planted at the usual times recommended, that is, in spring or autumn. I wish it to be distinctly understood, and I speak from practice, that I should always water evergreens when planted, whether the work is done in wet weather, dull weather, or dry, or whether the situation in which they are planted is wet or dry, sheltered or exposed, because the watering, as I have recommended, fills up the holes that may be in the earth about the roots and consolidates the whole mass much better than treading could do. It is therefore necessary at every season, but much less will be required after winter than spring or autumn planting. Within these few years I have planted an immense number of hardy evergreens, of all sorts and various sizes, both in wet ground and in dry ground, in autumn, winter, and spring, and they have been all treated in the way I have recommended.

In transplanting evergreens, it is desirable to leave as much earth about the roots as possible, but when treated in the way I have recommended, I consider the greater part of the earth that may be about the roots of importance, in preserving them from injury during the operation, rather than for any value it may have after the plant has been put into the ground. I am, however, speaking of ordinary sized plants, that is, from one to two and a half or three feet high; if much larger than this, I never could move them with success, without keeping a large ball of earth about their roots, and keeping it as entire as possible. One hint more, and then I have done with this part of the planting of evergreens. It will be found a useful appendage to the foregoing, without which, all that I have said will sometimes be useless, and the want of attention to which I have, at times, seen produce much mischief; it may prove especially useful to those who have much of such work to perform. It is, that I very seldom trust the planting of evergreens to workmen without being present to superintend the work. Every gardener, however, cannot do this, but when he cannot, he should give the charge to a very trusty man in his absence.

I am aware that when evergreens have to be got from a nursery and sent to a distance, where they must often be days, and even weeks, out of the ground, that the method I have recommended cannot be adhered to. In this case, nurserymen ought to be very

careful to injure the roots as little as possible in raising them, and to have them out of the ground as short a time as possible, and when packed, it should be in such a way as to prevent the roots from becoming dry, even if they were in the package for a fortnight. They should always be packed in hampers, with strong rods or stakes round the tops, and covered with a mat, and the tops of the plants should be left as loose in the inside as possible, never tied close together much above the level of the basket edge, as they sometimes are. When tied close together at the top, if they are long in the package, there is a great risk of many of them losing their leaves soon after they are unpacked, and with the best management, it will be long before the plants recover. Care should also be taken never to allow the roots to dry between the time they are taken out of the ground and the time they are packed. This method of packing would, no doubt, add a little to the weight, and, consequently, to the expense of carriage. The safety of the plants, however, will be found far to overbalance this additional expense of carriage. The careful way, too, in which they should be packed, would entitle the nurseryman to make a higher charge for his package; but this additional charge, too, would be amply repaid to the receiver by the superior state his plants would be in.

I am aware, however, that to attend to all this when evergreens are got out of a nursery in spring is very difficult. Let any man look into a nursery in April and May, the time that we have found that the greatest quantity of evergreens are sent out, and see a large order of evergreens of different kinds taken up from different parts of the nursery, see them all collected together and packed, he will find that at that season, in a dry day, under the most careful management, it is scarcely possible to get all this done before the roots have become perfectly dry. We know that evergreens are never taken up in a wet state to be sent to a distance, or, if they are taken up wet, they must be exposed till the leaves get dry before they are packed, which is nearly as bad as taking them up when dry. Now, these plants could, with perfect ease, be all taken up, collected together, and packed in a dull day in winter, even with ordinary care, without having their roots dried up; and I cannot too often repeat that this is always a primary consideration in transplanting evergreens. If, therefore, people will not plant evergreens in winter, I would, at all events, recommend them to get these plants out of the nursery in winter, to lay them in by the heels, soaking them well with water, and to let them lie there till what they call the best time for planting arrives; and then they will have their plants in a far better state than when got out of the nursery in April or May. I cannot help here taking notice of a quotation in the *Planter's Guide*, first edition, page 356, said to be obtained from one of the most candid and intelligent nurserymen in Scotland, for, although it alludes principally to forest trees, it applies equally well to evergreens.

This candid nurseryman is made to say—"Give gentlemen who are the most partial to planting but cheap plants, and they neither know nor care about the quality." (He is again made to say) "His

study, therefore, never is, nor can be, science, or the quality of his plants, but solely and exclusively the art of raising the greatest possible number on the smallest space of ground, and furnishing them to his customers at the lowest possible price."

Now, if this is the feeling among gentlemen and nurserymen (which I hope it is not), we cannot expect much attention, on the nurseryman's part, to the growing, taking up, and packing evergreens, in the best possible way, so as to ensure success with them when they arrive at their ultimate destination. He must receive a price for his article and for his packing which will enable him to live by his profession. This is, however, wandering out of my tract, and, perhaps, treading on rather brittle ground. I may mention, that in whatever way the plants are packed, or in whatever state they arrive, they should be unpacked immediately and laid into the ground, their roots covered over with earth (if possible, in rather a shady situation), and well soaked with water, until a favourable time arrive for planting them out. It will, however, in all cases where the plants have suffered in the package, be better to plant them out in a piece of nursery-ground, pretty close together for the first year, and plant them out the second year where they are intended to grow, always taking care to water freely. There are several kinds of evergreens which should never be ordered from the nursery unless they have been reared in pots; for among these, even with the most careful management in taking up, packing, and other after treatment, it is scarcely possible to prevent a number of failures. Even the *Arbutus* and *Alaternus* are among that number, unless they have been fresh planted in the nursery every year. The circumstance, however, of these plants having been kept in pots, implies that a nurseryman must have a higher price for them than for plants grown in the open ground without pots; but the superior state of the plants, and the success with them afterwards, would more than make up all the difference of price. I shall add a list, at the end, of those sorts that should always be kept, or at least a quantity of which should always be kept, in pots in the nursery.

I would beg leave, however, to recommend to every nobleman and gentleman who is at a great distance from a public nursery, where the carriage of large plants becomes expensive, and the long package often injurious, to get them in a young state and plant them in a nursery in their own premises, and when they arrive at a sufficient size they are then ready to plant out at any time when the weather is suitable for that work. Of the kinds raised from seed, such as have been one or two years transplanted out of the seed-bed, and of the kinds raised from cuttings, such as have been one year transplanted, I conceive to be of the most desirable size to order. The way that I have practised in nursing such plants, and which I have found to answer remarkably well, is to plant them out in rows in the nursery-ground at such distance between each row, and between each plant in each row, as will enable them to stand without being too much crowded at the end of the first year, and some sorts that are of slower growth may stand two

years before it is necessary to remove any of them. At the end of the first or second year, as it may be found necessary, every other row should be taken out, and, in some cases, every other plant in the row, and either planted out where they are to remain, or, if not considered large enough for that purpose, they should be planted in a piece of nursery-ground as before. The following year they should be again thinned upon the same plan; and this thinning may be repeated yearly for several years, till the plants that still remain attain a considerable size; and, although they have never been removed since the first planting, they are nearly as well prepared for removal as if they had been several times removed during the interval; for, by taking out the alternate rows and the alternate plants in the rows, the roots of such as remain must have been partly cut every year, thus compelling them to make fresh fibres, which is the object sought from their repeated removal.

Every person that has had any experience in planting evergreens must know that if they are allowed to stand long in the nursery without being transplanted (unless the foregoing practice is followed) there will be a much greater risk of failure when they are at last planted out; that this risk is greatly lessened by their having been frequently transplanted before. Every person that has a great extent of ground to plant with evergreens should get a quantity from the nurseries every year and nurse them as I have recommended, and then he will always have a succession coming forward; and when plantations of forest trees are about to be made, he will have it in his power to add infinitely to their beauty, by forming an underwood of *holly*, *portugal laurel*, *common laurel*, and *arbutus*. These would prove ornamental in the highest degree, would be excellent shelter, an exceedingly good cover for game, and, after they arrived at a certain age and size, would produce abundance of fruit or berries; and if it be ascertained that pheasants are fond of these fruits (as I know most other birds are), then they would produce food for them at a time when other food is scarce. I know that nurserymen in general are too enlightened and liberal-minded men to suppose that the practice I have recommended (even should it be adopted, which I fear it will not) would, in any way, hurt their trade. I am of opinion that the trade would be much benefited and the country much improved by it, because that every year an immensely greater number of evergreens would be planted. People soon tire of ordering evergreens year after year, when they find many of them die and many others remain sickly for years after planting. It is not unnatural that they should persuade themselves that it is the soil or climate that does not suit them; and then, of course, they cease to order more. I happened to be at a gentleman's seat in the month of July, 1825. In the spring of that year they had planted 500 Portugal laurels, which had been got out of a sale nursery, and when I saw them in July there did not appear to be 100 plants alive out of the whole, and not more than one-half of them were in good health—the others could not attain, for several years, the size they had reached when they were planted.

I do not intend to say anything on the raising of evergreens from seed or cuttings, as that seems to be quite as well understood by others as by me. I may be allowed, however, to mention that the same practice should be adopted in planting out of the seed-bed or cutting-bed as I have recommended when the plants are grown up, with this addition, that the roots of seedlings should be laid in puddle as soon as they are taken out of the ground, and then taken out of the puddle as they are planted. This will completely prevent the roots from getting dry during the time they are out of the ground; but it is also necessary to water them, for the watering keeps the ground in a moist state until the plants have got a sufficient hold of the ground to prevent them from suffering from dry weather which may follow. This practice would be an additional expense to nurserymen in planting, as a man could not plant near so many in the same time as he would do in the ordinary way; but from what I have done myself, and what I have seen others do, I am satisfied that the superior success of the plantation afterwards will more than repay the additional expense that may be incurred for labour in planting.

It may not be out of place here to mention that I consider it generally useless and, in most cases, as practised, hurtful to water in dry weather, during summer, evergreens which have been planted in spring. I am satisfied that in most cases more injury is done by watering in dry weather than by leaving the plants to their fate; besides, all the labour is saved and sometimes the plants also. It is a very common practice, when plants are supposed to want water in dry weather in the summer, to give them a little in the evening, from the rose of a watering-pot, so little that it does not penetrate into the ground an eighth part of an inch, and this is repeated two, three, or four times a week, as the state of the plants may seem to require. By this practice, the ground on the surface, from the hot drying sun through the day, gets hard and caked, which prevents any plants from thriving well; besides, not a drop of this watering ever reaches the roots of the plant, and therefore I consider it worse than useless. When watering in such weather is deemed necessary let it be done effectually, so as to reach the roots of the plant, and as soon as the water has dried up on the surface, let the whole part, as far as the water has extended, be regularly stirred over with the teeth of a rake. What I fear will not be believed is that in most cases in which artificial watering is necessary in the summer, a wet day ought to be selected for performing it, both for the sake of expedition and for the safety of the plants. It will, I know, seem a very foolish direction, and he will be called mad who says it is most beneficial to water plants while rain is falling abundantly; nevertheless, I am willing to stake my reputation for a moderate share of common sense upon it: I speak not theoretically, but practically. It has been my uniform practice, and I have for years seen its advantages. It is also necessary to observe that we must not think ourselves at liberty to stop short of drenching the lowest roots because it rains at the time. After such watering, if a little fresh earth can be laid over the surface, so much the better, but the

ground about the plants must never be left without being stirred over as soon as it gets a little dry; the practice is equally good, either in regard of old or of young evergreens.

I consider it unnecessary to mention any other evergreens than those I have already named, because they all require nearly similar treatment. *Rhododendrons* and *Kalmias*, however, may be lifted with perfect safety in autumn, winter, or spring, in wet weather or in dry weather, for when they are in ground that they thrive well in, they may be lifted with balls of earth, so large as scarcely to admit of their roots being disturbed; but at whatever time of the year they are planted, they, like others, should be well soaked with water, as already recommended.

There is but one reason why these evergreens are not more generally cultivated, namely, the expense in the way they are usually managed. Many, I am convinced, would not object to the expense of the plants themselves, but the difficulty and expense, in some situations, of procuring the soil which is represented as being essential to their well-being, prevents many from planting them to that extent which they would otherwise do. I shall, therefore, state here what will, in many cases, be found a cheap compost, and in which I find *Rhododendrons* and *Kalmias*, &c., thrive remarkably well, and, indeed, nearly all American evergreen shrubs, which are generally supposed to require, or are generally recommended, to be planted in peat earth. I say cheap, for when peat earth is difficult to be procured, and cannot be had at all, excepting from a considerable distance, it becomes very expensive. In many places, pit sand and vegetable mould, that is, the earth produced from the decayed leaves of trees, or other vegetable substances, or even rotted hot-bed dung, or a mixture of vegetable mould and rotted hot-bed dung, with sand, will answer equally well, and can often be got in abundance, where peat earth is scarce and expensive.

In good, fresh, hazelly loam, without any mixture whatever, *Rhododendrons*, *Kalmias*, &c., will grow and thrive perfectly. Indeed, if I may judge from the soil which adheres to the roots of imported American plants of these kinds, this is the kind of soil in which many of them are found naturally to grow at home. Many of them are also found in extremely thin strata of vegetable mould, over a subsoil of nearly pure sand. I never saw such peat earth, in which they are usually raised in this country, about the roots of imported American plants. As I never have seen any of the European species imported, I do not know what kind of soil they are found in; but I know, from experience, that in a fresh, hazelly loam some sorts will thrive admirably. Unfortunately, however, it is often as difficult to procure this kind of earth in Britain, and we have often to carry it as far as peat earth.

I, therefore, subjoin a statement of the proportions in which I recommend the substances I have spoken of to be mixed as a compost, in which to plant the delightful evergreens of which I am treating, and which every person, fond of horticulture, or "arbori-

culture," must desire to see greatly extended throughout the country.

Take *Peat earth*,
Pit sand,
Vegetable moula, or *old hot-bed dung:*

Let these three be mixed in equal proportions, and by being frequently turned, let them be thoroughly incorporated. Where vegetable mould, or old hot-bed dung, can with difficulty be got in sufficient quantity,

Take two parts of *peat earth*,
One part of *pit sand:*

Let these be well mixed, as above directed; but if the peat earth originally contain no sand, but is as pure as that commonly employed for fuel, it should be mixed with an equal quantity of sand. This last compost, however, will require a longer time before it is fit for use; it should, at least, be exposed for one winter, and during that time frequently turned. Even where peat earth can be got in any quantity, pit sand should be incorporated with it, to form a soil for these plants; for, in such a mixture, I have always found them to thrive greatly better than in pure peat earth.

There is not a doubt that where abundance of the proper compost has been prepared, it is well to obey the directions usually given, and to form entirely of it the border or plat, by previously removing the original soil to the depth of one and a half or two feet. Where little compost is prepared, or its expense felt, even when reduced by the substitutes I have recommended, I would advise that holes or pits be dug, accommodated to the size of the plants to be put into them; that some of the compost should be thrown into the bottom of the hole or pit; and after the plant has been put into its situation (the hole extending three or four inches in all directions beyond the roots of the plant), this hole should be filled up with the compost. In this way, one or two barrowfuls, according to the size of the plants, will be sufficient for each. Whether the plants are thus put into holes or pits prepared for each, or whether the whole border or clump is made of prepared compost, a top-dressing, to the depth of an inch or two, should be thrown upon the surface every second or third year, as the roots of all these plants rise to the surface, and without this will suffer from dry weather during the summer months. This observation, however, is chiefly applicable to plants in shrubberies or gardens, where the surface is kept clean by hoeing and raking; when raised as underwood, in plantations where the surface is grassy, and where the leaves of trees or other vegetable matter are allowed to lie and rot on the surface, a top-dressing is quite unnecessary.

The soil recommended above for the formation of the borders, I should recommend in preference to any other for top-dressing;

but where peat earth is not to be had, or is expensive from its distance, I should suggest the following composition as very well adapted for top-dressing.

Take one part *vegetable mould, old hot-bed dung*, or *old tan*, or *a mixture of all three;*
One part *pit sand*,
One part good *garden earth:*

Let these be thoroughly mixed together by frequent turning and exposure to the weather till they assume the appearance of one uniform mass of light sandy earth. This will form an excellent substitute for the former compost in top-dressing; and, indeed, I can assert from experience, that an abundant supply of such, completely incorporated and pulverised, will render us nearly independent of peat earth in cultivating these greatest ornaments of the garden or of underwood.

The beauty of those plants as evergreens, and the splendour of their flowers in May, June, and July, make it certain that the value of the addition which a profusion of them would give to every scene must be appreciated by everybody. I cannot, therefore, but believe that, if the treatment and soil which I have recommended, and in which I can confidently assert they thrive admirably, be adopted, attempts would be more frequently made to fill the parks and forests of landed proprietors with them. They are perfectly hardy—I have never known them suffer from the severity of our winters—so that they are more hardy than the Portugal Laurel, Common Laurel, or Laurestine, which have been known to suffer in some situations. I at present allude to the Rhododendrons and Kalmias, and I may include Azalea and Rhodora, though not evergreens, and many other shrubs, known by the name of American plants.

I have drawn out these observations far beyond the limits to which I at first thought they would have extended; but I have had two objects before me, and I could not accomplish them in smaller space. I was anxious to convince gardeners that the treatment of evergreens, at present generally recommended and practised, is injurious to them; and I was desirous of pointing out to proprietors of ornamental parks and ornamental plantations that subjects which their taste must dictate as fit for such situations may be obtained with much more certainty, and at much smaller expense, than is generally believed.

The statements I have made are contrary to the opinions, and opposed to the prejudices, of many of my professional brethren, and I doubt not will therefore be received by many with displeasure; but if I have made use of one expression which is calculated to give offence, or to hurt the feelings of any in the profession, I have done it inadvertently, and I am sorry for it. To my younger brethren, in particular, I would urge the following advice:—Believe nothing implicitly on my authority; exercise your own judgments; take every opportunity which you can possibly command to put to the

test of experiment the statements I have made, and abide by the decision of facts. If, after sufficient experience, I am found wrong, then reject as useless, or worse than useless, all which I have written. If the method I have recommended have a patient, careful, and candid trial, I entertain not the least fear that I shall be found wrong. Be assured that my confidence does not arise from theory; my confidence arises from long-continued, extensive practice and the almost invariable success with which I have been rewarded. That field in which I have been lately occupied is open to the public; and I fear no attack from any critic who will suffer himself to be led, in the formation of his opinion, by the state of the evergreens in the Royal Botanic Garden at Edinburgh. I write ardently upon the subject, because I feel keenly upon it. I admire evergreens; I am anxious to see them diffused in crowds over the country; and if the measures I have advocated be followed, I do not despair of seeing my wishes in a great measure realised.

One word more, and I have done. There never was a time in which so much was supposed to be done for the education of gardeners as at present; there never was a time in which more was expected from them; and there never was a time when their employers generally were so capable of judging of their proficiency; therefore, there never was a time in which more exertion was called for from a young man who has any ambition to rise in his profession.

I honestly confess that I shall be proud if I find that any representations of mine shall have increased the cultivation of evergreens; and I am ambitious to have it believed that the whole of these observations have been dictated, as in truth they have been, by a wish to benefit, not to criticise, any of my brethren.

A List of Hardy Evergreens, a quantity of which should always be kept in Pots in the Nurseries, and none of which should be ordered by Gardeners to be packed, and sent to a distance, unless they have keen kept in Pots.

Arbutus Andrachne - -	- Oriental Strawberry tree.
,, hybrida - - -	- Hybrid ,, ,,
,, Unedo - - -	- Common ,, ,,
,, ,, crispa - -	- Common curled-leaved Strawberry tree.
,, ,, fl. pleno -	- Common doubled-flowered Strawberry tree.
,, ,, fl. rubro -	- Common red-flowered tree.
Aristotelia Macqui - -	- Shining-leaved Aristotelia.
Aucuba japonica - - -	- Blotch-leaved Aucuba.
Buxus balearica - - -	- Minorca Box-tree.
Cupressus lusitanica - -	- Cedar of Goa.

Cupressus sempervirens - -	Evergreen Cypress.
,, ,, horizontalis-	Evergreen horizontal Cypress.
,, ,, stricta -	,, upright ,,
,, thyoides - - -	White Cedar.
Daphne Cneorum - - -	Trailing Daphne.
,, collina - - - -	Hairy ,,
,, Gnidium - - - -	Flax-leaved ,,
,, pontica - - - -	Pontic ,,
Erica arborea - - - -	Tree Heath.
,, australis - - - -	Spanish ,,
,, mediterranea - - -	Mediterranean Heath.
,, stricta - - - -	Straight-branched ,,
Ilex balearica - - - -	Minorca Holly.
Juniperus Oxycedrus - - -	Brown-berried Juniper.
,, phœnicia - - -	Phœnician Cedar or Juniper.
,, suecica - - -	Swedish Juniper.
,, virginiana - - -	Virginian Juniper or Red Cedar.
Laurus nobilis - - - -	Common sweet Bay.
,, ,, salicifolia - -	Common willow-leaved Bay.
,, ,, undulata - -	,, wave-leaved ,,
,, ,, variegata - -	,, variegated ,,
Ligustrum lucidum - - -	Wax-tree Privet.
Magnolia grandiflora - - -	Laurel-leaved Magnolia, and all the varieties.
Mespilus Pyracantha - - -	Pyracantha or Evergreen Thorn.
Phillyrea angustifolia - - -	Narrow-leaved Phillyrea.
,, latifolia - - - -	Broad-leaved ,,
,, media - - - -	Privet-leaved ,,
Photinia serrulata - - - -	Serrulate-leaved Photinia.
Pinus canadensis - - - -	Hemlock Spruce-fir.
,, Cedrus - - - -	Cedar of Lebanon.
,, halepensis - - - -	Aleppo ,,
,, maritima - - - -	Maritime ,,
,, palustris - - - -	Swamp ,,
,, Pinea - - - -	Stone ,,
Prinos glaber - - - -	Evergreen Winter-berry.
Quercus coccifera - - -	Kermes Oak-tree.
,, gramuntia - - -	Holly-leaved Evergreen Oak.
,, Ilex - - - -	Evergreen, or Holm Oak-tree.
,, Suber - - - -	Cork-tree.
Rhamnus Alaternus - - -	Common Alaternus.
,, ,, fol. argenteis -	,, ,, silver-striped.
,, ,, fol. aureis -	,, ,, gold-striped.
,, ,, balearicus -	,, ,, round saw-leaved.
,, ,, hispanicus -	,, ,, Spanish.
,, ,, latifolius -	,, ,, broad-leaved.
,, ,, maculatus -	,, ,, spot-leaved.
,, hybridus - - -	Hybrid Alaternus.
Thuja orientalis - - - -	Chinese Arbor-vitæ.
,, plicata - - - -	Nee's ,,
Ulex europæus fl. pleno - -	Double flowering Whin.

Ulex europæus strictus	- Upright Irish Whin.
Viburnum strictum	- Upright Laurestine.
" lucidum	- Shining "
Yucca gloriosa	- Handsome Yucca, or Adam's needle.

I may insert here the following "Recommendatory Notices" of this treatise which the publishers had culled from contemporary sources and inserted on the cover of McNab's other treatise on "Cape Heaths," of which a transcript follows. They are germane to this account of William McNab in expressing the esteem in which he was held in his time :—

Recommendatory Notices.

"This is a highly meritorious production."—*Edinburgh Literary Journal*, November 27.

"Our limits will not allow us at present to follow Mr. McNab through all the details of his practice, but we must refer to the pamphlet itself, which will be read with pleasure by those who feel an interest in the propagation of evergreens, and not the less so by those who are acquainted with the unassumming manners and real worth of the author."—*Quarterly Journal of Agriculture.*

"This little treatise is, we do believe, an excellent compend of really useful information. We recommend it very strongly for perusal to all who have it in their power to ornament a little villa garden, or to plant extensive policy grounds and preserves."—*Edinburgh Advertiser.*

"We are quite assured, then, that this publication will be read with much interest when it is known that it contains a detailed account of Mr. McNab's practice, which is founded on very common sense principles, and that he proves beyond the possibility of dispute that the treatment which will secure similar success to every cultivator is both much more easy, and far less expensive, than the system of maltreatment commonly recommended and followed."—*Edinburgh Courant.*

"Mr. McNab is an assiduous observer and a clear-headed thinker. His work contains much truly novel information, delivered with that diffidence which always accompanies true merit. It is just such a book as a practical gardener ought to write. We hope that his remarks will be attended to by our landed proprietors, and that the cultivation of evergreens may increase. There is not a better cover for game than your laurel, and we know no more beautiful and appropriate ornament to a dwelling-house than luxuriant clumps of evergreens."—*Edinburgh Literary Journal.*

"Every man who knows anything of the Botanical Garden at Edinburgh has heard of Mr. McNab, its excellent superintendent. He stands, we believe, at the very head of practical botanists. In many respects the subject is interesting, though, thitherto, it would

seem, but little understood, and Mr. McNab's hints, confirmed by pretty long experience, are worthy of attention."—*Edinburgh Evening Post.*

"This is a little pamphlet, in a modest shape, with a modest name, but the object at which it aims is neither inconsiderable nor of partial interest. We have read it with much interest and with much pleasure. It is the work of a practical man, addressed to practical men; and being perfectly satisfied of the reality of the errors which Mr. McNab endeavours to expose, and of the correctness of the practice which he wishes to establish, we are most anxious that his opinions should be extensively known; and it is with this view that we have thought proper to notice a pamphlet which we are convinced every cultivator ought to study in detail." —*Caledonian Mercury.*

APPENDIX B.

A | TREATISE | ON THE | PROPAGATION, CULTIVATION, | AND | GENERAL TREATMENT | OF | CAPE HEATHS, | In a climate where they require protection during the winter months. | By WILLIAM McNAB, | Superintendent of the Royal Botanic Garden, Edinburgh; | Associate of the Linnæan and Medico-Botanical Societies of | London; | Corresponding Member of the Horticultural Societies of London | and Edinburgh, &c. | Author of "Hints on the Treatment of Evergreens." | EDINBURGH: | THOMAS CLARK, 38 GEORGE STREET. | MDCCCXXXII.

As Scotland is a country already famed for native heather, it may appear somewhat paradoxical for anyone to attempt to recommend methods for the cultivation of any sort, where much expense and labour is annually expended to get a part of the genus eradicated.

It must be allowed, however, that native heather is turned to many very useful purposes, for in several parts of the Highlands of Scotland it is frequently used for a cover for houses where scarcely any thatch can be procured; and I can state, from my own experience, that a dry bed of native heather is, to the weary traveller in many parts of the Highlands, a real luxury.[1]

Of the kinds of heather which I intend more particularly to treat of, we need be in no apprehension that any will ever be acclimatized in this country so as to withstand our winters; for, as I shall afterwards show, though many of the Cape heaths are able to withstand a considerable degree of cold, I have no reason to think, from the trials I have made, that any of them will ever be brought to stand out of doors, even in our mildest winters, and, therefore, they never can become a pest to the agriculturist; and even the European heaths, not natives of Britain, although they stand our ordinary winters without protection, do not seem to

[1] "The stranger's bed
Was there of mountain heather spread,
Where oft a hundred guests had lain,
And dreamed their forests' sports again;
Nor vainly did the heath flower shed
Its moorland fragrance round his head."—Sir W. Scott.

increase from seed with the same facility as our native heather does. *Erica carnea*, which has been cultivated in the British gardens about half a century, appears to be the hardiest of all the European species, not natives of Britain, and even more hardy than *Erica vagans*, which is found native in the south of England. I have frequently seen *Erica vagans* killed down to the surface of the ground; and I believe it will always suffer in this way, when the thermometer falls to 24 or 25 degrees below freezing,[1] unless the ground is covered with snow, or there is some other covering over the plant at the time. I have never seen this plant wholly killed from the severity of our winters; and if injured, it pushes away freely from the roots again in spring, though exposed to a much greater degree of cold than mentioned above. The severest frost to which this country has ever been exposed, in my own recollection, has never injured *Erica carnea* in the smallest degree, which is not the case, as I before mentioned, with *Erica vagans*, and hardy as *Erica vagans* is, I have never seen it come up from self-sown seed, as is the case with most of our native heaths.[2]

So much indeed has already been written on the cultivation of Cape heaths, that it may be supposed little remains to be said on the subject. I am convinced, however, from what little I know, that much is yet to be learned in the right management of these delightful plants. The directions given by our best writers on their cultivation are often at variance with each other, and where this is the case, the inexperienced cultivator must always feel himself at a loss to know which of those statements he ought to follow. For instance, one says they will not thrive without good peat soil to grow them in (Sweet); another, that with a very few exceptions, a good sandy loam is the best, and that peat soil is not necessary for them, but even proves injurious (Bowie). The same author says they will not thrive in earth finely sifted; another, that if any substitute can be found for peat earth for growing heaths in, it is in leaf mould, sifted very fine, and mixed with fine sand (Loudon).

Other contradictory statements regarding their culture might be quoted, but I shall content myself with endeavouring to show what I have, from long experience, found to be a method which, if followed, will suit those plants so as to bring them to a high state of perfection, and when in such a state they are allowed by all to form by far the most ornamental tribe of plants for the greenhouse at all seasons. I trust I may be excused for quoting here a passage, on this subject, by the conductor of the "Gardeners' Magazine," vol. I., p. 366. "Of what other genus can it be said, that every species, without exception, is beautiful throughout the year, and at every period of its growth—in flower or out of flower—and of every size and age? Suppose an individual had the penance imposed on him

[1] In alluding to the thermometer, as I shall have requent occasion to do, I shall always take that of Fahrenheit, which fixes the freezing point at 32 degrees, and will therefore mention the number of degrees below that point.

[2] A list of all the hardy heaths, both native and foreign, is given in the Appendix.

of being forbidden to cultivate more than one genus of ornamental plants, is there a genus he could make choice of at all to be compared to Erica?—perpetually green, perpetually in flower—of all colours, of all sizes, and of many shapes!"

From the supposed difficulty in the management of Cape heaths, the cultivation of them was certainly on the decline for several years. About thirty years ago, some very fine collections and fine grown specimens of heaths were to be found in the neighbourhood of London, and several sorts then in cultivation are not now to be met with. I may mention some of these collections, such as the *Royal Botanic Garden at Kew, George Hibbert's, Esq., at Clapham; E. A. Woodford's, Esq., at Vauxhall; J. G. Angerstein's, Esq., at Woodlands, Blackheath; Messrs. Lee & Kennedy, nurserymen at Hammersmith; Mr. Richard Williams, nurseryman, Turnham Green, &c., &c.*

Now, any person that happened to be about London at the time I have mentioned, and might have occasion to visit it now, will, I am sure, agree with me in saying that there are not to be found in the neighbourhood of that great city such fine grown specimens of heaths as were to be seen about the end of the last and the beginning of the present century. Of late years, however, they are more sought after, and particularly since that public-spirited nobleman, the Duke of Bedford, published his *Hortus Ericæus Woburnensis*. This gave a considerable stimulus, and his Grace's collection at Woburn is now considered the best in England, both in number of species and their high state of cultivation. Many, I am convinced, would follow this noble example if they knew that Cape heaths are as easily grown as any other hardy greenhouse plant.

In Scotland, we have had several private collections kept up in great perfection for many years. The principal of these are *Lord Douglass's at Bothwell Castle*, and *Walter Frederick Campbell's Esq., M.P., of Shawfield and Isla.* An account of the management of Cape heaths, by Walter Henderson, gardener to the last mentioned gentleman at Woodhall, is published in the *Caledonian Horticultural Memoirs*, vol. III, p. 323, which I consider by far the best I have met with on the subject. I trust, however, I may be excused if I have occasion to differ a little on some points on their cultivation from such a respectable authority—an authority from which, I am proud to say, I have learned much useful information as well on the cultivation of heaths as in many other departments of gardening; and I may state, without the fear of contradiction, that Mr Henderson stands at the head of his profession as a practical gardener, and, what adds much to his reputation, is always found ready to impart knowledge to every one in the line who is anxious to obtain it. It is but fair to mention that Mr Henderson is a man of that stamp that would not write on any department of gardening unless he could show the good effects of it in his own practice, and in which he has always ample grounds to bear him out.

Professor Dunbar, in this neighbourhood, has perhaps the finest private collection of heaths of any in Scotland, and in high perfection. A catalogue of them has already been published in the "Gardeners'

Magazine," vol. 1, p. 131. Of a more recent date, Mr Cunningham, nurseryman, Comely Bank, near Edinburgh, has by far the richest sale collection of any in Scotland, and, I believe, few even in England excel it.

If I shall be fortunate enough to convey intelligibly my ideas on the cultivation of this highly interesting genus, I doubt not but we shall soon see them greater favourites than they have ever yet been.

I am quite aware that it is no easy matter for a man to communicate in writing what he has acquired by long and continued experience, and more particularly, for one who has not been much accustomed to use the pen; all that I shall therefore attempt is, to point out as distinctly as I can, the treatment which I have found, from long practice and observation, to answer best. Any person who does not wish to cultivate a full collection of them, may have a selection of from fifty to one hundred sorts, which will flower in succession the whole year.[1] I may mention that it is a mistaken opinion, but I believe a very general one, that Cape heaths will not thrive well in a greenhouse, intermixed with other greenhouse plants; but I know, from experience, that Cape heaths will thrive quite as well in a green-house, well ventilated, with other hardy greenhouse plants, such as some of those from the Cape of Good Hope and New South Wales, as they will do in a house by themselves.

Pelargoniums, however, and several other soft-wooded and more tender Cape and New South Wales plants, will suffer when expoesd to a degree of cold, in no way injurious to the genus Erica. I know that the degree of cold which Cape heaths will bear in this country, without in any way suffering from it, is far greater than has been observed in the country where they are natives.

We know, from undoubted authority, that certain species of Cape *Geraniaceæ*, and certain species of *Ericæ*, grow together in the same kind of soil, and in the same situation, intermixed one with the other, in their native country; but we know that in this country the same species of heaths will bear a degree of cold with impunity, which will materially injure, and in many cases kill, the *Pelargoniums* growing beside them. Many similar examples might be stated, but I mention only the Cape *Geraniaceæ* and *Ericeæ*, being two families which almost every one is more or less acquainted with.

Almost all the Cape *Mesembryanthemums* will bear as much cold, without suffering from it, as Cape heaths will do. The former, however, although they will thrive perfectly well in a house kept at a temperature for heaths, will also thrive equally well in a house kept at a temperature for Cape *Geraniaceæ*. Though they dislike a high temperature, they are certainly not so susceptible of injury from it as heaths are.

To grow Cape *Ericeæ* and *Geraniaceæ* well together would require far nicer management than I profess to be acquainted with. I know, however, that heaths will bear a degree of cold in the greenhouse in winter (which, I am persuaded, is beneficial to their health)

[1] A list of these will be found in the Appendix.

that will materially injure Cape *Geraniaceæ*. If, therefore, a particular point is to be found, to which the thermometer may be allowed to sink in the inside of a greenhouse during a severe frost, which will preserve the *Geraniaceæ* from injury and not produce too much fire heat for the safety of the heath, it is one which I have never been able to ascertain.

I am speaking, however, of these two families, so as to have them in a high state of perfection. They may be both kept in the same house, so as to make a tolerable appearance, but, I believe, not in such a state of perfection as if they were in separate houses, for the fire heat that is absolutely necessary during severe frost in the winter for the one, is, as far as my observation goes, sure to be, in some degree, injurious to the other. When the construction of the greenhouse is such (and this is generally the case) that one end can be kept warmer than the other, in such a house the *Pelargoniums* should be kept at the warmer end and the heaths at the colder, and with good management, they may be grown in this way tolerably well. Although Cape heaths will thrive perfectly well in a greenhouse well ventilated, along with other hardy greenhouse plants, yet I have little doubt they will have a much finer appearance when grown by themselves.

When it is known how easily they can be grown, and how little expense is necessary for fuel in keeping Cape heaths in this country, many noblemen and gentlemen may be induced to build houses and appropriate them wholly to this delightful family. In order to state my observations in this essay as distinctly as possible, I shall divide them into the four following heads, namely :—

1st. The propagation of heaths, and the treatment of them when young.
2nd. The soil best suited for their growth.
3rd. The different shiftings necessary.
4th. The general treatment when in the house, or out of doors, when it is necessary to have them there.

I shall, therefore, proceed to treat of the first branch of the subject, viz :—

1. The Propagation of Heaths.

The general mode (and, indeed, the best) of propagating Cape heaths in this country is by cuttings ; but in all cases where seeds of good sorts can be procured, either saved at home or imported from abroad, particular care should be taken in raising them, for there is a great probability of new varieties being produced, especially from seed procured in the heath houses of this country.

How far the disputed opinion may be correct, that cuttings or grafts, taken from an old and worn-out plant, cannot survive much longer than the term of life allotted by nature to the original plants from which these cuttings or grafts were taken, I shall not now stop to inquire ; but I may state, from my own observation, that I know

of no instance in heaths where they may not be grown as healthy and vigorous as they were the first day they were introduced into this country, where the same individual species has been successively propagated from cuttings for upwards of twenty years.

I find the greater proportion of heaths strike root freely when the young wood is taken, after it has become sufficiently firm, so as to prevent its damping off. The pots for the reception of the cuttings should be about nine or ten inches in diameter at the mouths. It is a good method, in preparing the pots for the cuttings, to fill them to within one inch and a half of the top with broken pots or coarse ashes, the upper part of which should be of a smaller size than those below, over which should be put a thin layer of fog (hypnum), to prevent the sand from working down among the draining; then the remainder of the pot should be filled with fine sifted sand to the level of the edge, and the sand pressed down very firm. After being well watered, the pot is then fit to receive the cuttings. I prefer pit sand for striking heath cuttings in; the colour of it is of little importance, whether white, grey, or yellowish; it should, however, be as free as possible of earthy and irony matter. The length of the cuttings must depend on the habit of the species. Of some of the free growing sorts, they may be about an inch and a half long, and from others that are of a more stinted growth, they may not exceed half an inch in length; in both cases they should be taken from the plant at the part where the young cutting sets off from the older wood. The leaves should be stripped off about half the length of the cutting, and the end should be cut clean with a sharp knife, or scissors. The cutting is then fit to be inserted into the pot prepared for its reception. In all ordinary cases, pots of the size I have mentioned will hold many different kinds of heaths. In extensive nursery collections, where great quantities of plants are wanted, one pot may be filled with cuttings of the same species, when such can be got in sufficient quantities; but in private collections this is not necessary, for a few plants of a sort, in general, are all that is required. When this is the case, the kinds selected to be put in the same pot should be as near of the same habit as can be judged of at the time. For example, I shall suppose four pots are intended to be filled with cuttings. Such as the following should be selected for each pot.

First Pot.	Second Pot.	Third Pot.	Fourth Pot.
Melastoma.	Pinea.	Ventricosa.	Aitoniana.
Petiveriana.	Pinifolia.	Prægnans.	Jasminiflora.
Petiveri.	Vestita.	Linnæana.	Ampullacea.
Sebana.	Grandiflora.	Linnæoides.	Irbyana.
Penicillata, &c.	Purpurea, &c.	Colorans, &c.	Inflata, &c.

Unless this is attended to, one sort will be found to strike root in a much shorter time than others in the same pot, which makes it more inconvenient when potting them out. This, however, must always happen to a certain extent, for a little difference in the age or firmness of the cutting, even when the work is performed by the

most experienced hand, will often make a difference in the time required to strike root. When the pot is thus filled with the cuttings, it should be well watered with a fine-rose water-pot and placed in a close shady part of the stove, admitting as little air as possible near to where the cutting pots are placed, and taking care to water them freely every day. Indeed, when put in this way, there is no risk of over watering them, for having them well drained, the water is allowed to pass freely through, and, so far from injuring the cuttings, they are benefited by it.

I am convinced that all Cape heaths will strike in this way when good cuttings can be procured of them. I very seldom use bell glasses for heath cuttings, nor do I consider them necessary for heaths in general. Some of them, however, which are more difficult to strike, such as *Erica glauca*, *aurea*, *taxifolia*, and a few other species, may be put under bell glasses and placed in the stove beside the others. Where no stove is at hand to put the cutting pots in, and where the situation in which they are to be placed has much air, then bell glasses are absolutely necessary. The pots, in this case, should be prepared for the cuttings which are to be covered with bell glasses in the same way as before recommended. The size of the pot must be regulated by the size of the glass which is intended to cover the cuttings. The glass, in this case, will require to be wiped occasionally to prevent any damp from injuring the cuttings; and when they have struck root, the glass should be removed gradually, some time before the cuttings are potted out. I am convinced that cuttings of heaths will strike root when put in at any season, if the cuttings are in a proper state, that is, when the young shoots are just old and firm enough to prevent them from damping off when first put in. Early in the spring, I judge, however, to be the best time for them; the cuttings will be rooted and potted out in sufficient time to get established in the pots before the following winter. Young cuttings and seedlings I consider very different in this respect from old plants. I shall hereafter show that old plants may be potted late in autumn, without suffering from it during the ensuing winter, but I have never found young cuttings or seedlings do so well if potted out late in the season, as at such a time as will enable them to get well rooted before the winter sets in. To those who may not already have had much experience in the propagation of heaths, I would recommend not to be discouraged although they do not succeed so well at first as they expected. Let them but persevere in their attempts and there is no fear of their ultimate success.

When the cuttings are rooted, which will be easily known by their beginning to grow freely, they should be potted into the smallest-sized pots and kept for ten days or a fortnight in a close shaded place; then expose them gradually to a more airy part of the house, taking care to shade them for a few hours in the heat of the day, if there happen to be much sun at the time. This shading should only be continued till the young plants are enabled to bear the full heat of the sun.

The soil for the first potting should be one-half peat and one-half

sand, always taking care to drain the pots well with small pieces of broken pots or cinders. The second potting must depend much on the season of the year; if the first potting is done in the spring, the second should be as soon as the young roots appear round the inside of the pots; but if the first potting is in the summer, then the second will not be necessary till the following spring. The soil for the second potting should be about two-thirds peat and one-third sand, and in all the after pottings the soil should be the same as will hereafter be recommended.

Having mentioned all that I consider necessary for the guidance of the inexperienced cultivator on the propagation of heaths from cuttings, I shall now say a few words on the treatment of those which are to be raised from seed. I am aware that *July* or *August* is the time recommended by some as the best for sowing the seeds of *Ericeæ*. The time, however, which I would recommend for sowing heath seeds is in February, or early in March. By sowing them at this season, we can always have the young plants sufficiently strong to stand the following winter. Whatever sized pots are used for sowing the seeds in, they should be filled, at least, two-thirds with broken pots or cinders, so as to have them well drained. The upper part should be filled to within one-fourth of an inch of the top with very sandy peat earth, and made level and firm; the seeds should then be sown on the surface, and scarcely any covering put over them. This precaution is absolutely necessary from the circumstance that the seeds of all the heaths are very small and unable to push through a deep covering. The pots, after sowing, should be watered with a very fine water-pot, and placed in a cold frame, under glass, where they should remain. They will require water every day, and if the weather be very dry, and much sun, they should be shaded with a matt for a time in the middle of the day. As soon as the seeds begin to vegetate, the frame should have a little air admitted to prevent damp, and this should be increased as the young seedlings gain a little strength. Whenever the plants are sufficiently large to bear handling without injury, they should be potted out into small-sized pots, always putting several plants in the same pot, particularly near the edge of it, as some of the seedlings may be expected to damp off in the first potting. The soil best suited for them is the same as for cuttings, namely, one-half peat and one-half sand; they should then be treated in the same way as is recommended for the cuttings when first potted out. I now come to the second part of the subject.

II. The Soil best suited for their Growth.

The soil which I have found Cape heaths thrive best in is a black peat soil taken from a dry heath, or common, which is never overflowed with water. In general, it should not be taken off more than five or six inches deep. This, however, must partly depend on the subsoil; for, in some cases, I have seen, at twelve or fourteen inches deep, the soil quite as good as at the surface. Whatever heath or other vegetable production is on the surface should be taken along with the peat earth to the compost ground, and there laid up into a heap

till wanted. It frequently happens that peat earth, taken from such situations as I have mentioned, has sand intermixed with it in its original state; but where this is not the case, a quantity of coarse white sand should be procured and mixed with the earth in the compost ground. This should be, at least, to the extent of one-fourth or one-fifth of the whole, and although a little excess of sand is used, it will never be found injurious to the health of the plant.

I prefer a coarse white sand, when such can be procured; but when that cannot be had, any coarse pit or river sand will answer equally well, and where an opportunity offers of procuring sand from free-stone quarries, or from the hewings of such stones used in buildings, it will answer equally well; but in either case let the sand be free of irony matter. When the earth and sand are properly mixed, I consider the compost fit for use.

I am aware that some difference of opinion exists on this point, some maintaining (perhaps such as are advocates for using vegetable manure in a fresh and green state) that peat earth is always best when taken fresh off the common and used immediately. Others consider it better after having lain for a year or two in the compost ground, and been turned over occasionally during that time; but, from practice, I have found no difference whether it is used immediately when brought from the common, or after it has lain for years in the compost ground. Care, however, should always be taken to have the compost ground in such a situation where the roots of trees cannot reach the earth during the time it lies there. The situation should also be dry and airy.

I am persuaded that we have as good peat earth in Scotland for the cultivation of heaths as is to be found in any part of Britain; and plenty, of superior quality, is to be had at no great distance from Edinburgh. Yet it is, nevertheless, true, that not more than thirty years ago, for all the Cape heaths that were grown about Edinburgh, peat earth was brought from the neighbourhood of London.

I have tried various soils to grow heaths in, but I have found none equal to the kind I have just mentioned, having grown them in it to greater perfection and seen them live longer than in any other I have tried.

There are, in the Botanic Garden at Edinburgh, heaths grown in the above-mentioned compost eight feet high, in tubs three feet over, and the plants are both bushy in proportion to their height and in great vigour; and these, when in flower, are covered with blossoms from the edge of the tubs to the top of the plants. These are, however, the freer growing kinds, such as *Erica Ewerana*, *Bonplandia*, *abietina*, *vestita-coccinea*, *grandiflora*, *&c.*

The dwarf growing kinds, such as *Erica depressa*, *atrosanguinea*, *petiolata*, *rupestris*, *Banksii*, *&c.*, *&c.*, could not, under any management, be grown to the above size. I may mention that I have used a small quantity of manure in the foregoing compost with very good effect, about one-eighth part of cow-dung. This should be well rotted before it is used. The way that I have always prepared this dung before using it is to take a barrow load of it and place it in

thin layers between layers of peat earth, and after it has lain for some time, chop the whole up together, and turn it over at intervals, till the dung disappears, and the whole mass assumes the appearance of black peat earth and sand; and where this manure is applied, about an equal quantity of sand should be added (that is, about one-eighth part of the whole) in addition to the sand that I have before recommended to be mixed up with the earth. This, I know, can be used with very good effect; but, for all ordinary purposes, I consider it quite unnecessary, as there is no difficulty in growing heaths very soon too large for the accommodation that is generally allotted for them, with the compost that I have mentioned without manure. I merely mention this, because I know it is the opinion of some that heaths will not thrive with manure added to the peat earth in which they are grown.

I know, however, that some heaths may be grown to a larger size, in the same space of time, with manure than without it; but, as I have already mentioned, I consider it quite unnecessary for all ordinary purposes, and any person who wishes to try its effects should do so very sparingly at first, till he is enabled to judge of the effect produced by it, as a little excess of manure is sure to injure the plants. Perhaps liquid manure might be used with very good effect for growing some kinds of heaths; but I am unable to give any particular directions in what proportion it should be used, as, from what trials I have made, I cannot come to any certain conclusion. But this much I know, that whoever wishes to try it, should do so at first with great caution, with quite as much as in using an excess of manure in its solid state.

This, however, is wandering from my original purpose, as I do not intend to advance anything but what I can support from practice. I shall, therefore, proceed to the *third* part, viz.:—

III. The Different Shiftings Necessary.

In shifting heaths from one pot or tub to another, I take any time from *March* till *August*, as opportunity will permit, or the state of the plants require. I have shifted heaths as late as November, and they have done quite as well as those repotted in summer. This time, however, is, in general, quite unnecessary, unless in the case of broken pots or other accidental circumstances, or in the case of heaths being planted in the open ground in the summer. If any of them should be required to be put into the house in winter, they may then be taken up and put into pots in the autumn, before the frost sets in very severely; but, unless under particular circumstances, it is quite unnecessary to shift heaths late in autumn, and I merely mention this to show that there is no danger to be apprehended from doing so at that time. I am aware that many say that heaths should be shifted in spring, or early in summer, in order that the pots or tubs may be filled with roots before the winter sets in; but if treated in the way I shall recommend, they will do just as well when shifted late in the summer as at an early period, and even in autumn, when necessity requires it.

Before beginning to shift, I have a quantity of the soil already mentioned riddled through a very coarse or wide-meshed riddle (if the plants are small, of course the riddle should be finer). I would always recommend the earth to be riddled, because it mixes the earth and sand much better than chopping can do; and if it has lain for some time in the compost ground, nearly all of it will pass through the riddle, but what little does not pass through, I keep to put in the pots over the draining. I use either broken pots or cinders for draining, whichever is most conveniently obtained. The latter I see is objected to as a drainer for some plants (*Gardeners' Magazine*, vol. 1, p. 224), but, from practice, I have seen no bad effects from using cinders for draining, and I know heaths thrive as well and their roots matt as freely among cinders as they do among potsherds. This, I think, is important to know, for the quantity of draining I use, and which I find quite necessary, for the growth of heaths is such, that to grow a large collection of them to a great size, would require a person to be in the neighbourhood of a pottery or brick work to get a sufficient supply. I always use plenty of draining. The largest-sized pots or tubs should have from three to four inches deep, and the smaller pots about the same in proportion to their size. There is scarcely any danger, indeed, of giving too much draining. When this is done, and the plant raised a little higher in the pot at each shifting than it had been before, that is, after two or three shiftings, the old ball about the stem of the plant should be raised two or three inches above the level of the edge of the pot or tub, keeping sufficient depth between the old ball of earth and the edge of the pot or tub to hold water. The annexed sketch will show the appearance of the plant when treated in the way I have recommended.

This is not a new practice, nor, if it were, is it one of my own invention; but from the good effects I have found result from it, I believe it is not so generally adopted as it ought to be. I was urged to adopt this practice upwards of twenty years ago by an eminent practical gardener, but, like many other inexperienced gardeners, I felt great reluctance in putting it in practice, for no other reason than that I fancied the plant looked as if it were ill potted, and, to my view, unsightly.

It would be foreign to my purpose at present to speak of any other plants but heaths. I may mention, however, briefly, that almost all the natural family of *Proteaceæ* are benefited by being treated in this way.

When the upper part of the old ball of earth and the stem of the plant are raised above the level of the edge of the pot or tub, as I have directed, there is scarcely a chance of the plant suffering from too much water being given it, even in winter; for, if by chance it does get too much, it can only be round the inside of the pot or tub, and at the extremity of the roots, the upper part of the old ball of earth and the stem being always so much higher, that the water runs down to the edge of the pot or tub, and the quantity of draining below will always keep the plant from suffering from a superabundance of water. It is also of advantage in winter to have the pots or tubs

raised on three pieces of wood, or bricks, above the level of the stage; this I consider beneficial to the health of the heath in winter, as well from its allowing a freer circulation of air under the pots or tubs, as from the increased facility with which a superabundance of moisture is allowed to escape freely from the pot or tub. I am convinced that heaths suffer more in the winter when grown in the ordinary way, from too much water and too much fire heat, than from any other cause whatever. But of heat I shall speak hereafter. In shifting heaths, I never reduce the old ball of earth more than by rubbing the sides and bottom with the hand, so as to loosen the outside fibres a little. I have often shifted heaths twice, and even three times, in the course of the spring and summer, with the greatest success. It is, however, quite unnecessary to shift a heath until the young fibres have come through the fresh earth given to it at its previous shifting, and begun to extend themselves round the inner edge of the pot or tub; but as soon as this takes place, they may then be shifted with advantage. This frequent shifting, however, is quite unnecessary, unless it be to encourage a favourite specimen; for in all ordinary cases, particularly when the plant is large, I consider one good shifting in two or three years quite sufficient. But in this case, when the plant is healthy (and it is quite unnecessary to shift it into a larger pot if it is not), I give it a much larger pot or tub than it had been grown in before. I am aware that this is contrary to the ordinary practice, as most people agree that heaths should not be put into a much larger pot than that from which it is to be removed; or, as gardeners would say, they should not be *over-potted.* Nevertheless, I know, from experience, that it is a good practice, and a great saving of labour, as all our large heaths are grown in tubs, some of them three feet over and two and a half deep.

These tubs are all made with iron catches, two on each tub, opposite to each other, and fixed on with strong rivets above the upper hoop. Two bent-iron handles are made to fit into these catches to lift the tub. These are all of the same kind and same size, so that the same pair of handles answers for lifting all the tubs.

When any of the plants in these tubs require shifting, they cannot be turned out by turning them upside down in the way practised in shifting plants in ordinary sized pots; all that is necessary with the tubs is to number the staves with a piece of chalk, and as the catch for the handle is above the upper hoop, the hoops can easily be driven off with a cooper's iron; the plant may then be lifted into the other tub prepared for it, and the tub out of which it has been taken may again be put together, and will answer a smaller plant.

Small tubs for plants will be found cheaper in the end than very large sized pots, for, under the most careful management, large pots are liable to get cracked or broken, particularly at the time of shifting; and I have seen no instance, either with heaths or any other plants, in which they have not thriven quite as well in tubs as in the best earthenware pots that are made.

In an oaken tub, with three good coats of paint on the outside and a thick coat of pitch or coal tar inside (and, in some cases, the tubs

we used were made out of oil casks) when, to all appearance, it is as impervious to moisture as even a glazed earthenware pot, but in such a tub I have seen no instance in which heaths did not grow as freely as in ordinary flower pots; and yet, though I have repeatedly made the experiment, I have seen no instance of a heath thriving in a hard burnt earthenware pot.

Besides the compost and draining which I have already mentioned, when I begin to shift heaths I have always at hand a quantity of coarse, soft, free-stone, broken into pieces, from an inch to four or five inches in diameter. Of these I always introduce a quantity among the fresh earth as it is put into the pot or tub, round the old ball of earth about the plant, and press them well down among fresh earth as it is put in. This I consider of great advantage to all sorts of heaths, but more particularly so to those that may have been shifted into a much larger pot or tub at once than what it had been grown in before, or in what I would call biennial or triennial shifting. These pieces of stone may be put in as large as the opening will admit between the old ball and the edge of the pot. In some of our largest tubs this opening is full four inches wide, and where much earth is required to be put in the bottom over the draining before the plant is put in, a quantity of these stones should be mixed with the earth also. I likewise use occasionally large pieces of soft burnt broken pots, put among the earth in the same way as the stones; but I prefer stones when I can procure them soft and free of iron. The quantity of stones which I introduce along with a large-sized heath at shifting, will, in most cases, if broken down into sand, and added to the sand previously in the soil, form about one-third part of the whole mass. When stones are introduced among the earth in the way I have recommended, heaths will never suffer so much in the summer from occasional neglect to water them as they would do if the stones were not introduced; because these stones retain the moisture longer than the earth, and in the winter they allow a freer circulation of any superabundant moisture which may be given through the mass.

I am aware that Mr Bowie (*Garaeners' Magazine*, vol. 1, p. 364) recommends small pieces of stones to be mixed with the earth in which heaths are grown. I may mention, however, that it was practised here long before Mr Bowie's paper appeared, which can easily be shown by examining the ball of earth of any of our oldest heaths in this garden.

What induced me first to try stones mixed with the earth were hints received from another meritorious collector now no more. But I shall have occasion to mention his name hereafter, as having received from him many other useful suggestions regarding the cultivation of heaths. It is but fair, however, to state that Mr Bowie, as far as I know, was the first to recommend this practice in print. Although the use of stones among the earth for growing heaths has been practised here more than ten years, and I have seen pieces of broken pots used in the same way, and for the same purpose, about London nearly thirty years ago, it cannot, therefore, be considered an invention of Mr Bowie's, and certainly it is not one of mine.

This, I believe, is all I can say of importance on the soil and shifting of heaths; I shall, therefore, proceed to the *fourth* and last part of this essay, and the one which I consider the most important of all, being convinced that no man will ever grow heaths well unless the practice I am now to recommend, or something similar to it, is attended to, namely:—

IV. The General Treatment of Heaths when in the House and out of Doors; when it is necessary to have them there.

Many of the following observations were derived from hints communicated to me in repeated conversations on the culture of Cape heaths with my much lamented friend, the late Mr James Niven, who certainly knew more of the nature and culture of that genus than any other man I ever met with. It is well known that Mr Niven was upwards of ten years at the Cape of Good Hope as a collector, and was well acquainted with all the situations in which they are to be met with in that country.

For many years before his death Mr Niven resided in the village of Pennycuick, in the neighbourhood of Edinburgh, where he rarely met with a Botanical friend. He died at Pennycuick on the 9th January, 1827.

Mr Niven's *Hortus Siccus* of Cape *Ericeæ* is now in my possession, and contains many species never yet introduced into Britain; at least many that I have never met with in cultivation. I beg it to be understood, however, that all I have hitherto stated, as well as what I am now going to recommend, is not the mere theory of Mr Niven, or of any other man, but is founded on my own successful practice.

When I mention the treatment heaths should have when in the house, I must let it be understood, that if I had sufficient accommodation under glass, I never would take heaths out of doors, unless it were for the purpose of shifting or taking them from one house to another. My practice would be to keep them in the house in the summer, giving them plenty of air, and to keep them cool during winter. I know it is the common practice to turn heaths out of doors for four or five months in summer and autumn, and it is also a pretty general opinion that by doing so it makes them hardier and enables them to stand the winter better than they would do if kept within doors during summer. From this opinion I must take the liberty of differing, as I know of no species of heath that will not bear as much cold in winter, without suffering from it if kept in the house during the summer, as they would do if they were turned out of doors, and many of them (perhaps all), I know, will bear more cold in the winter if kept in the house during the summer. For, by the latter practice, the young wood gets better ripened and better able to resist cold in the winter. It would be travelling out of my way at present were I to mention any other plants but heaths, but I may be allowed briefly to mention that heath is not the only genus among our greenhouse plants that is benefited by this mode of treatment. It is, however, unnecessary to dwell longer upon this, because no

place that ever I have seen has sufficient accommodation to keep the whole of the collection under glass during summer; for unless they are placed quite separate from each other, so that a free circulation of air can pass among them, they will suffer much more when crowded in the house in the summer than they will do in the same situation during the winter; for in winter they are in a more dormant state, and not growing with the same vigour. I would, however, advise every one to keep as many of their best specimens and best kinds within doors during the summer as they can, without having them crowded close together. I cannot give better directions than to say that one should not touch the other when in the house in summer, and if the nearest part of one to the other is two or three inches apart, so much the better. The house, however, should be well ventilated at all times, and, except in cases of high wind or heavy rain, both top and front lights should be open night and day; and besides watering the earth in the pots freely when they require it, they should be well watered over head with the garden engine every day, and if the weather is hot and dry this operation should be performed twice every day, namely, both morning and evening.

It is very seldom that heaths are attacked with any insect; the green fly is the only one I have observed, and this very seldom; but when it does happen, a little tobacco smoke for a night or two, when the house is shut close, will readily destroy it, and when this is necessary, it is always better to apply it for two nights in succession in a small quantity than to give too much at once. The same quantity of tobacco, if used for two nights in succession, will have a better effect in clearing the house of the insect than if used all at once.

I am aware it is supposed that heaths do not like the smoke of tobacco; but I have never seen them suffer from it, and I believe it will never injure them if too much is not used at one time. It answers all the purpose wanted, that is, in destroying the insect, by giving a little at two times, in place of giving a great quantity at once, and thus no risk is run of injuring the heaths. I never have seen heaths injured by tobacco smoke, even when a strong dose was applied; but it is always best to avoid extremes, for although I have not seen any injury arise from it, I do not mean to say that other people may not have observed it; and, therefore, the safest way is to use little at a time.

Part of the heaths which are intended to be turned out of doors during the summer should be removed as early in the spring as the weather will permit, as I have already said it is much more injurious to have them crowded in the house in spring, when they are in a vigorous state of growth, than during winter, when they are in a more dormant state.

If the weather be favourable, a part of them may be turned out towards the end of April, if a sheltered, shady situation is at hand to place them in. I may mention, that at this season, they should always be placed in a situation well protected from the easterly wind, for they will suffer much more from it after being turned out of the house in spring, if not well protected, than what they will do from a sharp frost late in autumn. Another part may be taken out of

the house in May, and by the middle of June the whole that is intended to be removed for the season. At whatever time they are put out, always choose, if possible, a moist dull day, and when this cannot be got, place them in a shady situation for some time, till they are enabled to bear the full rays of the sun without suffering from it. They should then be placed in the greenhouse ground, taking care to keep them at a sufficient distance from each other so as not to be in any way crowded together. Let them be plunged in the ground from two to six inches deep, according to the size of the pots. This saves much labour in the summer in watering, and it also keeps the plants from being blown over by the wind; and I have seen no injurious effects arise from it. Besides, the saving of labour in watering is far more than over-balanced by the time that is occupied in putting them in. Care, however, should always be taken to keep the bottom hole in the pot open so as to let the water pass freely through. Such plants as are in tubs, turned out in the summer, I never plunge in the way the pots are done; not from any fear of injuring the plant, but the tub. In place of plunging it, I raise it an inch or two above the surface with three pieces of brick, or pieces of wood, of equal thickness; for, in this case, the saving of labour in watering would not compensate for the injury done to the tub; and if the tub is large, no danger need be apprehended of its being blown over with the wind. The plant, however, should be well secured with stakes, to prevent its being broke by the wind. If plenty of coal ashes is at hand, a little may be put under each pot, to prevent worms getting into them, although I have very rarely seen worms get into the heath pots through the quantity of draining I use. The plants should be regularly looked over every day, and such as want water should be supplied with it; and if the weather is dry, they should be watered over head every day with the garden engine. During the summer this should always be done in the evening; but late in the autumn, what water they may require, either from the water-pot or the engine, should be given in the morning. Any of the plants out of doors, that may come in flower late in the season, should be removed into the greenhouse, as the heavy rains and high winds injure their appearance when in flower.

Although I have never seen heaths injured here by frost when fully exposed to the weather, till after November, it is then necessary to have them moved into the house; and to prevent the heath-house being crowded too early, a part of the duplicates may be left in an open shed, if such is unoccupied at the time, until the thermometer falls 7 or 8 deg. below freezing, as we have seldom such a cold here till past the middle of December. It is then necessary to move the whole into the house that is intended for them. In all cases, in the middle of winter, heaths will sustain no injury in the house, with the front lights open both day and night, until the thermometer falls more than 8 deg. below freezing. I would not, however, advise this to be practised in spring, in case of the same degree of frost happening at that time; for we have often mild weather in February and March, and so much sun, that the heaths are forced into a more vigorous state of growth than they

are in winter; and when in such a state they will not bear so much cold without suffering from it as they will do in the early part or middle of winter. For instance, in the spring of 1830 we had the thermometer, on the morning of 2nd April, 10 deg. below freezing.

I have had the whole heaths in the house frozen for days together so hard that the pots could not be removed from their places without breaking them, and fresh air constantly admitted at the time, and I have never seen one of them suffer in the smallest degree from it; but, on the contrary, found them thrive better than under any other treatment.

I have several times had the heath-house in winter without fire heat when the thermometer out of doors stood at 16 deg. below freezing. But in these cases the house was always shut close, and I have never seen the heaths suffer from this cold. I would not, however, advise any person to risk his heaths in such a temperature until he had himself tried some experiment on the degree of cold which they will bear; and from that he will learn more than he could from volumes written on the subject. A very little observation will soon convince him that heaths require but little fire heat during winter. When I mention fire heat I consider the mere matter of heat the same, whether derived directly from fire or from water or steam-pipes, provided that smoke and steam are excluded.

I have already said that heaths suffer from too much artificial heat, and all that I have read on their cultivation seems to concur in this particular; but I am not aware that anyone has pointed out what degree of heat or cold is injurious; and I have, indeed, only been able to ascertain this myself to a very limited extent.

The time, however, when these plants suffer most from heat is when a sharp frost sets in and no heat is applied till after the frost has taken effect in the inside of the house. Then a fire is put on, and the frost is driven out. It is better, no doubt, in such a case to keep out the thief if you can; but if once let in, keep him in and never attempt to force him out. We know that heaths in the open air will not suffer when the thermometer stands 4 or 5 deg. below freezing; and we know also that heaths in the house in winter will bear the same degree of cold with impunity. Now we shall suppose the thermometer out of doors to fall to 12 or 14 deg. below freezing, and no heat in the heath-house; the thermometer in the inside may then be 4 or 5 deg. below freezing. If there be no appearance of a change, then it is necessary to apply heat to the house; but all that is wanted in this case is just enough to keep the temperature from getting lower than it was when the heat was introduced. Suppose the thermometer to sink to 18 or 20 deg. below freezing during the night, the instrument inside should range as near as possible to what it was when the heat was applied. This, however, requires very particular attention. From what I know, heaths will suffer if, after the thermometer has fallen 4 or 5 deg. below freezing inside of the house, heat is added so as to raise the temperature and drive out the frost during the time the thermometer is still sinking out of doors. It would be much better if the house were left without fire heat, even

with the thermometer out of doors 15 or 16 deg. below the freezing point. Such treatment is bad for all plants, but more particularly for heaths. If we were certain that the thermometer during the night would not sink more than 10 or 12 deg. below freezing out of doors, no artificial heat whatever would be necessary in the heath-house.

It is an excellent practice in dull weather in winter, and even frosty weather, if much damp is in the house, to throw in a little heat during the day, but this should never be done unless the weather is such that plenty of air can be given to the house at the same time, nor even when frost is in the house; and the heat should always be stopped before the air is taken off. This, however, is unnecessary unless the plants appear to suffer from damp. Very little water should be given during frost, indeed none, except to those which appear to suffer from want of it; but in mild, dry weather they should be watered freely with the watering-pot, and the engine should also be used once or twice a week, according to the state of the weather; that is, when it is dry and mild, with much sunshine.

It is a very general opinion that heaths will not thrive in a low and damp situation. This, however, is so far incorrect, for heaths will thrive quite well in such a situation where the house can be well ventilated and attention paid to drying up the damp during the day in the way I have directed. Indeed, in pits covered with glass, if we had the power of keeping them free from damp in such a situation, we could keep heaths perfectly well without fire heat by covering the glass during severe weather with straw or matts. The glass covering is quite sufficient to protect them from injury until the thermometer falls more than 7 or 8 deg. below freezing; and then it is advisable to apply some additional covering. The woolly-leaved kinds, such as *Erica Massoni, gemmiflora, bruniades, pubescens* &c., are very liable to suffer in such situations. It is, however, very difficult to lay down any general rule for this, further than by mentioning particular species that have been tried; for *Erica ferruginea*, which is very similar in habit to the two first mentioned species, that is, *Erica Massoni* and *gemmiflora*, will bear cold and damp to a much greater extent without suffering from it than these others will do.

I am aware that it is difficult to preserve heaths for any length of time without suffering in a dwelling-house; but this, I think, is easily accounted for, as in such situations they are never allowed a sufficiency of air, or, if they get enough at one time, they are totally excluded from it at another; and if it is during the winter, they are often shut up in the drawing-room, where the heat during part of the night is sufficient for our tenderest tropical plants, with perhaps a sharp frost out of doors. No wonder, then, that heaths do not thrive in such situations, and subjected to such treatment.

There is a very considerable difference in the degree of cold which Cape heaths will bear without suffering from it. Many of them will be much injured when the thermometer falls 8 or 10 deg. below freezing; many others will require 10 or 12 deg. below freezing to produce the same effect. A list of those which I have repeatedly

tried, as well those that are hardier as those that are tenderer, will be given at the end of this essay. This list, of course, is very limited, but still it is a beginning, and everyone that has it in his power may add to it from his own trials, or prove, for his own satisfaction, those which I have tried. In every collection where heaths are grown to any extent there must be several every season which will be ejected from the house, either for want of room or from being unsightly, ill-grown specimens; and it is much better to plant them out or keep them in pots in the open air than to cut their heads off and throw them to the rubbish-heap as soon as they are condemned, particularly as this selection generally takes place at the end of the season, when the plants are put in the house. If kept in pots it cannot be much additional labour to keep them alive by giving them a little water until their executioner comes round, which will, in general, be some time in December; but not always so, for, on the 20th January, 1829, we had 29 species of heaths planted out which remained without injury till the 21st and 22nd January the same season. The thermometer then fell 14 deg. one night and 17 deg. the other below freezing, when they were all totally destroyed. The frost before that had never been more than 9 deg. below freezing, viz., one night in November, 1828. This, however, is the only instance that I know in which heaths stood so long without injury from frost. I have, however, known them suffer very little till the beginning of January; but, in general, we have here the frost sufficiently severe either to injure or quite kill them some time between the middle and end of December—very seldom earlier.

It must be understood, however, that I am speaking of the part of the country in which I reside. Of course, in other parts, if the thermometer falls 14 or 15 degrees below freezing in October or November, it will produce the same effect as such a cold could do in December. I have not, however, observed such a cold about Edinburgh till the latter month.

Any person who will take the trouble to treat his surplus heaths in this way will soon gain more information for himself on the degree of cold they will bear than he will be able to obtain from any author.

I have no wish to introduce the disputed question whether plants may be accustomed, after long cultivation, to bear more cold than when first introduced into this country from a warmer climate, or what we would call acclimatized. I know from experience, however, that young heaths, one, two, or even three years old, whether they are from cuttings taken from the old plant, or from seed produced by the same plant from which the cuttings were taken, when planted out in the open ground, or kept in pots out of doors in summer, will not bear so much cold as the older plants in autumn or middle of winter. Indeed, this is the case with the greater part of plants (heaths as well as others) that I have had an opportunity of trying in this way.

We should, therefore, always prefer old plants to put out when we have the power of choice, before young plants; and when we

have not such choice, we should always protect the young plants with additional covering during winter, beyond what will be necessary for the older ones.

Let any person try the experiment with a broad-leaved myrtle, a plant which most gardeners have it in their power to try; he will find that the old myrtle (if the winter is not very severe) will resist the cold, and, if partially injured, will always set out again in spring from the older wood; but the young myrtle, in a similar situation with the old, will, in most cases, be totally killed the first winter, although the young plant had formerly been taken as a cutting from the older, or raised from seed from the same plant.

In stating the degree of cold which heaths will bear without suffering from it, I have been careful always to keep rather above what I know they will endure; and any person who will take the trouble to observe accurately the cold that heaths will bear, will find that they will not suffer when the thermometer falls a little lower than what I have stated. It would require observations made for a series of years, and a correct statement of the situations and soil in which the different kinds are found at the Cape, to come to any certain conclusion what degree of cold they will bear in this country.

It appears, however, from the short list of habitats which Mr. Bowie has given in the "Gardeners' Magazine," vol. I, p. 365, when compared with the observations which I have made, that those which are found in pure sand, or in loam, and exposed to drought, are hardier here than those that are found in rocky places, or in shady or moist situations.

From the preceding statement it will appear, as I have already mentioned, that heaths require very little fire heat during winter, probably not more than six or eight nights during our severest winters; the expense of fuel, therefore, can be no object in their cultivation.

I have to apologize for having extended these observations to a much greater length than I at first anticipated; but on revisal I found I could not abridge them without in some degree impairing their usefulness to the inexperienced cultivator of heaths, for whose benefit they are chiefly intended.

Royal Botanic Garden,
Edinburgh, November 8th, 1831.

APPENDIX.

List of Hardy Heaths.

Erica
- arborea
  - stylosa
- australis
  - superba
- carnea
  - præcox
- ciliaris
- cinerea
  - alba
  - atrosanguinea
  - carnea
  - monstrosa
  - rubra
- mediterranea
- minima
- multiflora
- ramulosa
- stricta
- Tetralix

Erica
- alba
- carnea
- umbellata
- vagans
  - alba
  - pallida
  - tenella
- viridipurpurea
- vulgaris (Calluna)
  - alba
  - aurea
  - coccinea
  - decumbens
  - flore-pleno
  - spicata
  - spuria
  - tomentosa
  - variegata

List of the most Ornamental Heaths, which will flower in succession at all times of the year.

Erica	Time of Flowering.
abietina	Sept.-Mar.
acuminata	Mar.-June.
Aitoniana	June-Oct.
ampullacea	June-Aug.
andromedæflora	Apr.-June.
ardens	Apr.-June.
aristata	May-July.
Blandfordiana	Mar.-June.
Bonplandia	Apr.-June.
Bowieana	Mar.-Sept.
bruniades	Apr.-Aug.
buccinæformis	May-Aug.
carneola	May-Aug.
cerinthoides	Sept.-June.
Cliffordiana	Sept.-Feb.
colorans	Oct.-June.
Coventryana	Mar.-June.
cubica	Apr.-July.
Cussonia	Jan.-Mar.
depressa	June-Aug.
echiiflora	Apr.-June.
Ewerana	July-Aug.
elegans	Apr.-July.
erosa	June-Aug.
expansa	Mar.-July.
exsurgens	Aug.-Nov.
fasicularis	Feb.-May.
florida	May-Aug.
glauca	May-July.
gracilis	Mar.-June.
grandiflora	May-Sept.
grandinosa	May-Sept.
hyacinthoides	June-Aug.
inflata	June-Sept.
Irbyana	July-Oct.
jasminiflora	July-Sept.
kalmiflora	Aug.-Feb.
Lambertia	Aug.-Apr.
Linnæana	Jan.-May.
superba	Mar.-May.
linnæoides	Nov.-May.
magnifica	June-Nov.
mammosa	Sept.-Mar.
melastoma	Apr.-July.
metulæflora	Apr.-Sept.

Erica	Time of Flowering.
Monsoniana	Oct.-May.
mucronata	Apr.-Aug.
mundula	Mar.-July
mutabilis	all the year.
nigrita	Mar.-Aug.
odorata	Apr.-July.
Parmentierii	June-Aug.
Patersonia	Mar.-July.
perspicua	May-Aug.
picta	Mar.-June.
prægnans	May-July.
primuloides	May-July.
Princeps	Apr.-July.
propendens	May-July.
pubescens	Mar.-Nov.
pyramidalis	Feb.-May.
quadriflora	Mar.-Aug.
radiata	May-Aug.
reflexa	May-Oct.
resinosa	Feb.-Aug.
retorta	July-Aug.
Savilea	July-Aug.
scabriuscula	May-July.
Sebana	Mar.-June.
Shannonea	July-Sept.
Solandar	all the year.
spuria	May-Aug.
sulphurea	Mar.-June.
taxifolia	June-Dec.
Templea	May-Aug.
Thunbergii	June-Aug.
togata	June-Aug.
tricolor	June-Sept.
tubiflora	Apr.-July.
tumida	July-Sept.
ventricosa	June-Sept.
alba	June-Sept.
carnea	June-Sept.
coccinea	June-Sept.
erecta	June-Sept.
stellifera	June-Sept.
superba	June-Sept.
verticillata	Sept.-Mar.
vestita-coccinea	Apr.-Nov.
alba	
purpurea	

Hardy Cape Heaths.

Heaths which will stand in the open air in autumn or middle of winter without protection, with the thermometer 7 or 8 deg. below freezing, without suffering in any way from such a degree of cold.

Erica
- acuminata
- aggregata
- campanulata
- cerinthoides-superba
- comosa alba
- conferta
- congesta
- corifolia
- cruenta
  - superba
- cupressina
- curviflora
- Ewerana-pilosa
- expansa
- exudans
- ferruginea
- flaccida
- globosa
- glomerata
- gracilis
- grandiflora
- hispidula
- hyacinthoides
- ignescens
- intertexta
- leucanthera

Erica
- longiflora
- longipedunculata
- lucida
- mammosa
- margaritacea
- montana
- nigrita
- pendula
- perlata
- physodes
- pubescens-minor
- ramentacea
- rosea
- serpyllifolia
- setacea
- Sparmannia
- splendens
- tenella
- tenuiflora
- tetragona
- transparens
- triflora
- ventricosa
- viridescens
- verticillata

Tender Cape Heaths.

Heaths which are tenderer than those mentioned in the preceding List, and when exposed to the same degree of cold there stated will be injured by it, but will not suffer although fully exposed to a temperature 4 or 5 deg. below freezing.

Erica
- abietina
- albens
- articularis
- assurgens
- baccans
- barbata
- Blæria
- Bonplandia
- caffra
- calycina
- cerinthoides-alba
- comosa-rubra
- colorans
- concinna
- Coventryana
- cubica-minor
- cyclindrica
- daphniflora
- decora
- depressa
- discolor
- divaricata
- elata
- Ewerana
- gelida
- halicacaba
- incarnata

Erica
- Linnæana
  - superba
- linnæoides
- mollissima
- nudiflora
- mundula
- pellucida
- persoluta
- perspicua
- prægnans
- propendens
- pubescens-major
- quadriflora
- radiata
- reflexa-rubra
- rubens
- Sebana
  - aurantiaca
- simpliciflora
- sessiliflora
- spicata
- spuria
- triceps
- trivialis
- tubiflora
- urceolaris
- vestita-rosea
- viscaria