

## ROBERT L. HARROW, V.M.H.

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WHEN our President came to Kew in 1890 all the student gardeners and sub-foremen prepared to give him a very cool reception, not because of any dislike for him, but because the circumstances of his coming to Kew did not meet with their approval. In short, Mr. Harrow came to Kew as a sub-foreman, instead of as a student; this was due to an arrangement between the Kew and Cambridge authorities whereby Mr. Harrow came to Kew and I think Mr. G. Lamb went to Cambridge, exchanging positions. The coolness of his reception did not deter Mr. Harrow; he ignored it and set about his duties in the Fernery Department with that quiet, persistent enthusiasm which has characterized his whole life and raised him to the very responsible position he now occupies as Curator of the Royal Botanic Garden, Edinburgh. Notwithstanding the strong "feeling" that existed when he came to Kew, and although he took little interest in cricket and the few other sports indulged in in those distant days, Harrow became one of the most popular men of his time, and I cannot remember a "farewell party" that was better attended than the one given in his honour (we held our "farewells" at Isleworth in those days) just before he went to Edinburgh.

The privileges of a friendship that has remained unbroken for about thirty-five years, permits me to say that no task he has ever had to undertake has been too great for "R. L. H." His reserve force is extraordinary, and difficulties that would have broken the heart of a more robustly demonstrative man have been overcome by him without any apparent effort. Studious, persistent, keenly observant (therefore entirely capable), and with the saving grace of humour, Mr. Harrow has accomplished wonderful work at Edinburgh under the late Sir Isaac Bayley Balfour and the present Regius Keeper, Prof. W. Wright Smith, both of whom have recognized his skill and ability. It is a pleasure to all his friends to know that during the year of his Presidency of the Kew Guild his fine work for horticulture and horticultural botany has been recognized by the Royal Horticultural Society, which has bestowed upon him the coveted honour of V.M.H.—Victoria Medal of Honour in Horticulture.

Of Mr. Harrow's early experiences there is little need to write. Kent is the county of his birth, and in it he served his horticultural apprenticeship, afterwards serving with Messrs. B. S. Williams at Holloway and eventually passing to the Cambridge Botanic Garden, where, being "diligent in business," he found favour with the late Mr. R. Irwin Lynch and gained promotion. From Cambridge he came to Kew, as stated above, and in January 1893 he went to Edinburgh with a fine recommendation from Sir Wm. Thiselton-Dyer; it is in the Scottish capital that his life's work may be seen by all who visit its famous Botanic Garden.

C. H. C.

## ANNUAL REPORT, 1925-1926.

THE Committee have pleasure in submitting for the consideration of the members of the Guild the Annual Report for the year ending April 30, 1926.

The Annual General Meeting of the Guild was held at the Imperial Hotel, Russell Square, W.C. 1, on May 20, 1925. The President of the Guild, Mr. William Dallimore, occupied the Chair, and was supported by a large and representative gathering of fellow Kewites. The Meeting was followed by the Annual Dinner, when the President presided over an attendance of 134 members.

At the Annual General Meeting the principal items that were discussed were the proposed Kew Guild Educational Scheme and the William Watson Memorial Fund, and it was resolved that subscriptions should be invited from within the Guild in furtherance of the objects stated.

Subscriptions amounting to £110 0s. 0d. have been received in connection with the Educational Fund, and one grant has been made from the amount subscribed, *i. e.* a refund amounting to £4 4s. 0d. in respect of expenses incurred as entrance fees, to a young Kewite who recently gained the National Diploma in Horticulture. The Committee wish to take this opportunity of inviting further subscriptions to this fund, and would remind members that the sum aimed at when the Scheme was first initiated was £1000.

Subscriptions amounting to £48 18s. 0d. were received for the William Watson Memorial Fund. A Memorial headstone was recently erected over the grave of the late Mr. William Watson, A.L.S., V.M.H., at St. Albans Cemetery.

The Committee wish to place on record their appreciation of the way in which our Secretary has carried out the duties which were necessitated by the appeals in connection with the Schemes formulated at the Annual General Meeting, and in particular in reference to the William Watson Memorial Fund.

The decision arrived at on the occasion of the Annual General Meeting, "that the capital sum of the Dummer Memorial Fund, amounting to £61, should be invested in some gilt-edged security, and that the interest should be used as it accrued annually, to provide a prize for the best collection of British Native Plants made by a Student-Gardener while at Kew," had resulted in the capital sum being invested in 4 per cent. British Funding Loan, 1960-90.

The receipts for the year amount to £54 8s. 9d., and the expenditure to £25 16s. 3d.

Mr. R. L. Harrow (Edinburgh) has been nominated by the Committee to be President of the Guild for the ensuing year. The Members of the Committee who retire are Messrs. A. D. Cotton, F. G. Cousins, C. H. Curtis, and W. Leslie. The following have been nominated to fill the vacancies:—Messrs. J. Coutts, W. H. Johns, W. W. Pettigrew, and D. Tannock.

Mr. R. F. Williams has again consented to be nominated as Hon. Treasurer for the ensuing year, and Messrs. S. A. Skan and C. H. Curtis are recommended as Auditors. Mr. E. G. Dunk will continue to act as Secretary and Editor.

The Committee wish to impress upon members that articles and notes of interest should be forwarded to the Secretary-Editor at every opportunity that arises. Without this assistance it is impossible for a Journal worthy of the traditions of our Association to be published. The Committee regret that the 1926 number of the *Journal* was published later than in recent years; it was solely due to the fact that copy was very late in coming in. It is noted with pleasure that increased support has been found among business firms of long standing, who have occupied advertising space within the pages of the *Journal*. It is very desirable that we should give our patronage to these firms, and so ensure obtaining the valuable financial assistance that results from this service.

### BALANCE SHEET.

YEAR ENDING 30TH APRIL, 1926.

RECEIPTS.			EXPENDITURE.		
To	£	s. d.	By	£	s. d.
*Balance from 1924-25 A/c .	135	2 2	Subscriptions to Royal Gardeners' Orphan Fund.....	1	1 0
Life Subscriptions .....	14	7 0	Subscriptions to Gardeners' Royal Ben. Institution ...	1	1 0
Annual Subscriptions:—			Purchase of Typewriter ...	11	10 0
Arrears up to and including 1925 .....	7	6 0	Honorary to Secretary and Editor .....	10	0 0
Subscriptions for 1926 ...	1	18 0	Treasurer's and Secretary's Postages .....	2	4 3
Advance Subscriptions for 1927 .....	0	5 0	*Balance.....	163	14 8
Special Sales of the Journal .	5	1 0			
Dividend on £300 New South Wales Stock .....	12	0 0			
Dividend on £26 6s. 3d. 5 per cent. War Stock .....	1	6 2			
Interest on Deposits in Post Office Savings Bank .....	3	14 1			
Advertisements in 1925 issue of the Journal .....	6	5 0			
Advertisements in 1926 issue of the Journal .....	1	12 6			
Balance from 1925 Dinner Account .....	0	14 0			
	<u>£189</u>	<u>10 11</u>		<u>£189</u>	<u>10 11</u>

\* Includes Balance of War Memorial Fund, £29 0s 6d.

## CAPITAL ACCOUNT

as on the 30th April, 1926.

LIABILITIES.		ASSETS.	
	£ s. d.		£ s. d.
Thomson Bequest .....	92 8 6	£300 New South Wales 5 per cent. Stock (1935-55)	300 0 0
248 Life Subscribers of £1 at two-thirds rate .....	165 6 8	£26 6s. 3d. 5 per cent. War Stock (1929-1947).....	26 6 3
181 Life Subscribers of £2 at two-thirds rate .....	241 6 8	*781 Journals at 4d. each ...	13 0 4
Balance of Assets .....	29 10 8	†241 Journals at 1s. 3d. each	15 1 3
		Deposit in Post Office Savings Bank .....	163 14 8
		Value of Typewriter after allowing for depreciation.	10 10 0
	<u>£528 12 6</u>		<u>£528 12 6</u>

\* Face value written down two-thirds.

† Face value written down one-half.

## DINNER ACCOUNT, 1925.

(Dinner held 20th May, 1925.)

RECEIPTS.		EXPENDITURE.	
	£ s. d.		£ s. d.
134 Tickets at 7/- each .....	46 18 0	134 Dinners at 6/6 .....	43 11 0
		Dinner Tickets, Circulars, and Toast List .....	1 9 6
		Postages .....	0 17 6
		Stationery .....	0 3 0
		Carriage on table decorations and incidental expenses...	0 3 0
		Balance .....	0 14 0
	<u>£46 18 0</u>		<u>£46 18 0</u>

## BENEVOLENT FUND.

Balance Sheet and Statement for year ending 30th April, 1926.

RECEIPTS.		EXPENDITURE.	
	£ s. d.		£ s. d.
*Balance from 1924-25 A/c..	80 5 5	Purchase of £70 Stock of 4 per cent. Funding Loan...	†60 18 0
Subscriptions .....	0 10 0	Commission thereon .....	†0 3 6
Interest on Deposits in Post Office Savings Bank .....	1 12 4	Loan to member .....	7 0 0
		Balance at Bank .....	14 6 3
	<u>£82 7 9</u>		<u>£82 7 9</u>

\* Includes £61 1s. 6d. Dummer Memorial Fund.

† Expenditure on behalf of Dummer Memorial Fund.

Note.—The actual Assets on 30th April, 1926, of the Dummer Memorial Fund and the Benevolent Fund are £60 18s. 0d. and £21 6s. 3d. respectively.

## EDUCATIONAL FUND.

Balance Sheet for year ending 30th April, 1926.

RECEIPTS.			EXPENDITURE.				
	£	s.	d.		£	s.	d.
Total Donations .....	110	0	0	Printing and Stationery ...	2	2	6
				Refund of expenses incurred by Mr. W. H. Barker, N.D.H., in connection with the examination taken by him for the National Di- ploma in Horticulture, and in accordance with the regulations governing the grant of assistance out of the Fund .....	4	4	0
				Balance at Bank .....	103	13	6
	<u>£110</u>	<u>0</u>	<u>0</u>		<u>£110</u>	<u>0</u>	<u>0</u>

## WILLIAM WATSON MEMORIAL FUND.

Balance Sheet for year ending 30th April, 1926.

RECEIPTS.			EXPENDITURE.				
	£	s.	d.		£	s.	d.
Total Donations .....	48	18	0	Postages, Receipt Book and Receipt Stamps .....	2	5	0
				Cost of Memorial Stone and Lettering thereon .....	32	7	2
				Cemetery Fee .....	4	15	0
				Secretary's expenses in- curred on visit to St. Albans, and other inci- dental expenses .....	0	13	0
				Photograph of Memorial ...	0	10	0
				Balance at Bank .....	8	7	10
	<u>£48</u>	<u>18</u>	<u>0</u>		<u>£48</u>	<u>18</u>	<u>0</u>

The foregoing Accounts have been compared with Vouchers, Bank Books, Receipts, etc., and found correct—

R. F. WILLIAMS, *Hon. Treasurer.*  
E. G. DUNK, *Secretary.*

W. DALLIMORE,  
S. A. SKAN, } *Hon. Auditors.*

May 3, 1926.

## ANNUAL GENERAL MEETING.

OWING to the industrial crisis in this country and the uncertainties of the means of travelling, it was very reluctantly that those responsible for the arrangements in connection with the Annual General Meeting and Dinner, which was to have been held at the Clarendon Hotel, Hammersmith, London, W. 6, on May 26th; 1926, had to inform members of the indefinite postponement of the event.

At a Committee Meeting held early in July it was resolved to hold the adjourned Meeting in the Lecture Room at Kew on July 31st at 6 p.m.

The date fixed proved an inconvenient one to many and, in consequence, the attendance was very low, only sixteen members being present. Among this number were Messrs. A. C. BARTLETT, T. F. CHIPP, W. DALLIMORE, E. G. DUNK, T. H. EVERETT, A. E. P. GRIESSEN (India), J. H. HOLLAND, H. G. KING, A. OSBORN, T. W. TAYLOR, and J. WEATHERS. Mr. DALLIMORE, the retiring President, occupied the Chair. The business was of a formal character, and consisted principally of the adoption of the Annual Report and Balance Sheet, which had previously been circulated amongst the members of the Guild. Mr. J. WEATHERS moved the adoption of the Report and Balance Sheet, and congratulated the Association on its financial position, though disappointment was expressed at the low figure of annual receipts from ordinary subscriptions.

Mr. A. C. BARTLETT seconded the adoption of the Report and Financial Statement, and on the proposal of the CHAIRMAN the motion was agreed to.

Mr. WEATHERS remarked on the poor response that had attended the appeal for subscriptions to the Educational Fund, and suggested that the Watson Memorial Fund balance of £8 7s. 10d. should be added to the existing money available, as there did not appear the slightest possibility of the original sum of £1000, which was aimed at, being received. Mr. DALLIMORE suggested that as the attendance was so small it would be better to leave any discussions as to the disposal of the Educational Fund to the Annual General Meeting of 1927. This suggestion was agreed to.

The SECRETARY then explained to the Meeting that the Dümmer Memorial Prize for 1925 had been awarded to Mr. T. EVERETT, whose collection of British Native Plants was adjudged as the best sent in for examination. The prize consisted of Mr. Bean's 'Trees and Shrubs Hardy in the British Isles' (2 volumes) and contained an illustrated book-plate with a portrait of the late Mr. R. A. Dümmer. Mr. DALLIMORE presented the volumes to Mr. EVERETT.

A vote of thanks to Mr. DALLIMORE concluded the Meeting.

## THE MUTUAL IMPROVEMENT SOCIETY.

Session 1925-26

THE ANNUAL GENERAL MEETING was held in the Garden Library during September 1925, when the following officers were elected for the session:--Mr. J. COUTTS (Chairman); Mr. T. W. Taylor (Vice-Chairman); Mr. W. FRY (Hon. Secretary); Mr. S. F. OVENDEN (Assistant Hon. Secretary); Messrs. KNIGHT, WILLOUGHBY, and HAYES (members of the Committee).

In compiling the syllabus for the session the number of offers to read papers was far in excess of the dates available, so very reluctantly many had to be declined, though with a wider range of subjects to choose from it was possible to include almost every branch of horticulture.

The Director, Dr. A. W. Hill, opened the session with an extremely interesting paper on "Antarctica," and dealt at length with the peculiarities which are associated with identical floras appearing in widely separated areas. The theories put forward as offering possible solutions to this puzzling state of affairs were very fascinating, and the whole subject was one which held our attention to the close of the lecture. On November 16th, 1925, we had an unexpected visit from Mr. W. Cradwick, who, in a witty talk, told us of the chief products of Jamaica and the general characteristics of the island. Mr. Dallimore gave us his "hardy annual" (as it is generally termed), and it was as welcome and instructive as ever, for he has always sound advice and encouragement for those who feel doubtful about their prospects and feel generally "fed-up." Mr. Raffill's lecture was illustrated with some really excellent slides, and his talk on "Wonders of Plant Life" provided us with one of the most interesting lectures that have been delivered for several sessions. Mr. F. P. Knight came to the help of the Society by filling a gap occasioned by illness, and his homely talk on the Kew Arboretum was of great interest, although some might consider it a subject too well known to appear on our syllabus. The lecturers throughout the session dealt with their subjects in a very thorough manner, and all the papers were of a very high standard and quite comparable with previous years. It is now well recognized that Mr. Coutts and Mr. Taylor have done so much for the Society that their continuance in office is almost synonymous with its success.

The Hooker Memorial Prize was awarded to Mr. W. G. Fry, and the Society's Prize to Mr. S. F. Ovenden.

Three "trips" were arranged during the summer months. The first, to the propagating department at Hyde Park, was conducted by our Chairman on June 3rd, 1926, and some thirty members enjoyed a very pleasant evening thanks to the kind attention of Mr. T. Hay, the Park Superintendent. Rothamsted Experimental Station was also visited, but the inclement weather which prevailed prevented us seeing

very much of the work that is being done in the open at this Institution, and as the journey was made by char-a-banc it will be realized that we had full benefit of a rainy day. The third and final trip of the season was made to the John Innes Horticultural Institute at Merton. Thirty-seven members of the Society spent a very pleasant evening and saw the many branches of research work in which this Institution is engaged.

*Syllabus.*

1925.	Subject.	Lecturer.
Oct. 12.	Antarctica (L.L.).....	Dr. A. W. Hill, F.R.S., etc.
„ 19.	R.H.S. General Examinations.....	Mr. T. H. Everett.
„ 26.	Some Plants of the Lake District (L.L.) .....	Mr. T. R. Hayes.
Nov. 2.	Birds and Horticulture .....	Mr. W. H. Bromley.
„ 9.	Hardy Fruit .....	Mr. S. B. Sayer.
„ 16.	Agriculture in Jamaica .....	Mr. W. Cradwick.
„ 23.	Vines .....	Mr. C. MacGregor.
„ 30.	Tropical and Subtropical Aquatics .....	Mr. W. E. Bassett.
Dec. 7.	Plant Associations of the Western Highlands .....	Mr. C. V. Marquand, M.A.
„ 14.	Market Gardening in Ireland .....	Mr. R. C. McMillan.
„ 21.	The Culture of Vegetables .....	Mr. J. Robbie.
 1926.		
Jan. 4.	The Opportunities of Kew .....	Mr. W. Dallimore.
„ 11.	Peaches .....	Mr. J. H. Lock.
„ 18.	Daffodils .....	Mr. P. Trevaskis.
„ 25.	Sidelights on Horticulture .....	Mr. J. W. England.
Feb. 1.	Chrysanthemums .....	Mr. C. R. Stock.
„ 8.	Wonders of Plant Life (L.L.).....	Mr. C. P. Raffill.
„ 15.	A Tour through the Kew Arboretum.....	Mr. F. P. Knight.
„ 22.	The Botanic Gardens, Cambridge .....	Mr. G. Ford.
Mar. 1.	Notes from Holland.....	Mr. H. Bruins-Lich.
„ 8.	An Impromptu Debate.	
„ 15.	The Secretary's Report.	

(L.L.=Lantern Lecture.)

W. G. FRY, *Hon. Secretary.*

THE CRICKET CLUB, 1926.—The Annual General Meeting was held on April 4th, 1926, when the following officers were elected for the season, viz.:—Mr. S. F. Ovenden (*Hon. Secretary*), Mr. G. Ford (*Captain*), Mr. A. G. Hopkins (*Vice-Captain*), with Messrs. W. Franklin and E. V. Willoughby as members of the Committee. Mr. Ovenden obtained a position in the Gardens at La Mortola, and at a Meeting held on June 7th Mr. C. Stock was elected to the vacant position of *Hon. Secretary*.

A fixture list of 23 matches was arranged; of these, 17 were won, 5 lost, and the remaining fixture was unfortunately scratched. As far as the records for previous seasons can be traced the season 1926 was a record one in so far as successes to the Club are concerned. This satisfactory state of affairs was due to the unusual enthusiasm displayed by members throughout the entire season.



The fixture which aroused the keenest enthusiasm and interest throughout the Establishment was the annual match Staff *versus* Student-Gardeners, which was played on Kew Green on June 16th. The Staff batted first, on what appeared to be a batsman's wicket, but were dismissed for 45 runs, this being due in no small measure to the excellent bowling of Jarman, whose analysis was 4 wickets for 14 runs. The Student-Gardeners then went in to bat, and half an hour later the tea interval was taken. The Director and Miss Hill entertained both teams with their friends to tea on the Lawn Tennis Ground. During the interval rain began to fall, and it appeared doubtful whether further play would be possible. The Staff team, however, were determined to obtain a decision, and it was decided to play on in spite of the inclement weather. The Student-Gardeners finally won the match by the small margin of 3 wickets (46 runs for 7 wickets being the final score). The second Wednesday afternoon fixture proved to be the most exciting match that has been played for several seasons. Our visitors were Cliveden, who batted first and put together the useful total of 99 runs. Only 90 minutes were left the Gardens to obtain the necessary runs to ensure a decision being arrived at. The opening pair, Messrs. Ford and Willoughby, compiled a very useful 35 runs before being separated. Four wickets, however, fell with but 47 runs being scored, and matters did not appear too happy for the home team. Franklin, however, treated the spectators to a display of lusty hitting, and was responsible for bringing the score to within 20 of our opponents' total, and at the same time raising the hopes of Kewites very considerably. Messrs. Roberts, Goldsmith, and F. A. Barham added runs, and the last was responsible for the winning hit a few minutes before the time agreed upon for drawing stumps.

A new innovation was a match with the University Botanic Garden Staff at Cambridge. Owing to the long journey the members of the team were obliged to leave Kew early; leave was granted by the Director as with the Wednesday afternoon fixtures. A very interesting game resulted in a win for Kew by 14 runs. At the tea interval, Mr. F. G. Preston in a short speech expressed the hope that this match would become an annual event and so prove a bond of fellowship between the Staffs of the two Institutions. At the close of the match we were shown around the Gardens, and the return journey was made later in the evening.

The match at Cliveden provided a very pleasant outing, despite the inclement weather in the early afternoon. The match ended in a victory for Kew by 52 runs. After tea had been taken the team was shown round the beautiful estate by the head-gardener.

The remaining matches in which the Gardens' team were successful were those against Victoria Working Men's C.C., the 6th Richmond Scouts, the Kew Section of the Ministry of Labour, the local branch of the British Legion, Beverley Park, and the John Innes Horticultural

Institution. The five matches in which Kew was defeated were those played against the John Innes Horticultural Institution, the Kew Section of the Ministry of Labour, 6th Richmond Scouts, the Victoria Working Men's Club, and Aldenham. The return fixture with the last named team had to be scratched, owing to the General Strike.

The batting honours go to Mr. W. Franklin, who scored 156 runs during the season, averaging 15·6 per match; Mr. G. Ford averaged 13 runs per match, with an aggregate of 182; the highest score was made by Mr. W. Franklin, who compiled 36 out of a total of 70 in the match against the Kew C.C. II. on July 13th. Mr. C. Pateman headed the bowling averages, having taken 34 wickets at an average of 4·64 runs; Mr. G. Ford occupied second place with 45 wickets with an average of 5·02; while Mr. E. Willoughby secured 18 wickets for an average of 5·77 runs, and Mr. W. Franklin 22 wickets for an average of 6·81 runs. Mr. H. Patten helped in the dismissal of 11 opponents by securing that number of catches, Mr. G. Ford secured 9, and Mr. C. F. Coates 7.

The Committee wish to take this opportunity of thanking all members and supporters for their wholehearted interest in the activities of the Club during the past season.

It may be of interest to future members of the Club to know that char-a-banc trips were arranged and added interest to all the away matches during the past season.

C. R. STOCK, *Hon. Secretary.*

THE SWIMMING CLUB, 1926.—The Annual General Meeting was held on April 8th, when the following officers were elected:—Mr. H. Bruins-Lich (Hon. Secretary), Mr. W. G. Fry (Captain), Mr. M. Goldsmith (Vice-Captain), Messrs. G. Ford and F. A. Barham (Committee). Early in the season Mr. Bruins-Lich left Kew, and Mr. Fry was requested to act as Hon. Secretary and Captain of the Club.

The season 1926 brought to light very little new talent and no outstanding performances have to be recorded, but at the same time the Club amply fulfilled its purpose, and many enjoyable evenings were spent at the Richmond Public Baths and in the River Thames. The sunless periods during the summer months and the Coal Strike of 1926 rendered aquatic sports somewhat a chilly ordeal, and attendances were often very low on club nights, both at the baths and in the river. The principal event during the season is always the Mile Championship race from Brentford to Kew Bridge, and this year aroused quite as much enthusiasm as in former years. Friday, August 13th, was chosen for the event (the superstitious should note this date), and the weather was unkind from the spectators' point of view, as rain fell heavily during the race. Major T. F. Chipp (in the absence of our President) officiated as umpire, assisted by Mr. Coutts, while Corporal Sealy again acted as starter and timekeeper. Six entries were

received, the competitors being Messrs. F. A. Barham, G. Ford, W. Fry, H. Goldsmith, H. Ritchings, and F. Thorns. All were soon away at the start, but after the first 100 yards or so Goldsmith, Ford, and Fry took the lead. Goldsmith swam a very fast stroke and Fry was soon swimming equally as well. It was obvious, however, that pace must soon tell, and Fry was forced to slacken and was overtaken by Ford, and later had to leave the water. Goldsmith now had a distinct lead, and though Ford made a very determined effort, the former with his easy style and endurance won an easy victory in 19 mins. 30 secs. The respective time of the other competitors was:—Ford, 20 mins. 15 secs.; Barham, 20 mins. 20 secs.; Ritchings, 22 mins. 5 secs.; and Thorns, 23 mins. 10 secs.

The race was followed by a Flannel Dance, held at the Kew Pavilion, which was well attended. The Championship Race is usually the termination of the season's activities, but it was pleasing to note that members continued their practice for several weeks later; this in itself is sufficient indication that much pleasure was obtained by the members of the Club during the season.

W. G. FRY, *Hon. Secretary.*

#### THE BRITISH BOTANY CLUB, 1926.

THE General Meeting was held on March 15th, 1926, when Mr W. E. Bassett was elected as Honorary Secretary, and Mr. T. H. Everett, Mr. F. P. Knight, and Mr. C. R. Stock were elected as members of the Committee.

The season 1926 was, on the whole, very successful, although at its beginning botanizing was somewhat hindered by the General Strike, when several members acted as Special Constables, and by unfavourable weather, which caused the postponement of two evening trips and made the drying of specimens difficult.

Seven evening outings were arranged, one of the most interesting being conducted by Mr. Irving through the Queen's Cottage Grounds.

After the middle of June the weather was much drier, and the preparation of specimens became easier.

The half-day trips were all favoured with hot, sunny weather, and Burnham Beeches, Guildford, Staines, and Gravesend were visited. The journeys to Guildford and Gravesend were made by road, and all taking part decided this to be a much more pleasant way of travelling than by train. The best thanks of the Club are due to the members of the Garden and Herbarium Staffs, who have conducted the outings and done so much to make them a success.

At the end of the season twelve collections were submitted for examination, certificates being awarded for all of them. The best collection was made by Mr. W. Nemes, those of Mr. R. C. McMillan and Mr. R. C. McGregor also receiving special mention. The other

collectors were Messrs. B. W. Allison, V. C. Barham, A. J. Cheek, L. Cook, J. W. England, J. Lawson, J. C. Nauen, J. Robbie, and P. Trevaskis.

W. E. BASSETT, *Hon. Secretary.*

#### THE LECTURES, 1925-26.

**Genetics.** Lecturer, Mr. W. B. Turrill, M.Sc. 10 Lectures. Maximum marks, 100. Highest aggregates: A. W. Anderson, 100; W. E. Bassett, 99; T. H. Everett, 99.

**Plant Pathology (Fungi).** Lecturer, Mr. A. D. Cotton, F.L.S. 25 Lectures. Maximum marks, 250. Highest aggregates: J. R. Sealy, 246; O. B. Orchard, 243; R. F. Williams, 234; W. G. Fry, 226.

**Soils and Manures.** Lecturer, Mr. F. Crowther, A.R.C.S. 10 Lectures. Maximum marks, 100. Highest aggregates: O. B. Orchard, 98; W. E. Bassett, 92; S. F. Ovenden, 92; A. E. Wise, 91.

**Advanced Systematic Botany.** Lecturer, Mr. C. H. Wright, A.L.S. 25 Lectures. Maximum marks, 250. Highest aggregates: A. E. Wise, 229; S. F. Ovenden, 227; W. E. Bassett, 223.

**General Botany.** Lecturer, Mr. T. A. Sprague, B.Sc., F.L.S. 36 Lectures. Maximum marks, 300. Highest aggregates: T. H. Everett, 300; M. C. Goldsmith, 270; C. McGregor, 270; R. C. McMillan, 270; J. Robbie, 270; S. J. Roberts, 270; S. G. Sayer, 270; C. R. Stock, 270.

**Geology and Soils.** Lecturer, Dr. H. H. Thomas. 10 Lectures. Maximum marks, 100. Highest aggregates: S. J. Roberts, 94; A. G. Brown, 88; G. J. W. Ford, 88; M. Goldsmith, 88; J. H. Lock, 88; J. C. Nauen, 88; L. Stenning, 88; C. R. Stock, 88; L. Strachan, 88; P. Trevaskis, 88; T. H. Everett, 88.

**Plant Ecology and Elementary Systematic Botany.** Lecturer, Mr. W. B. Turrill, M.Sc., F.L.S. 12 Lectures. Maximum marks, 100. Highest aggregates: J. W. England, 97; W. C. Ibbett, 97; R. C. McMillan, 94; V. G. Barham, 93.

**Economic Botany.** Lecturer, Mr. W. Dallimore. 20 Lectures and Demonstrations. Maximum marks, 150. Highest aggregates: W. E. Bassett, 150; T. H. Everett, 150; A. E. Wise, 146; J. W. England, 136.

**Plant Pathology (Insect Pests).** Lecturer, Dr. J. W. Munro. 12 Lectures. Maximum marks, 100. Highest aggregates: A. E. Wise, 85; T. H. Everett, 84; W. C. Ibbett, 80; J. H. Lock, 80; S. J. Roberts, 80; P. Trevaskis, 80.

**Physics and Chemistry.** Lecturer, Dr. P. Haas. 25 Lectures. Maximum marks, 100. Highest aggregates: W. Everitt, 95; J. Lawson, 92; L. Cook, 90; W. E. Stewart, 90.

## APPOINTMENTS AND RETIREMENTS.

IN the recent King's Birthday Honour List we noted with much pleasure that the Director had received the Honour of the Companionship of the Most Distinguished Order of St. Michael and St. George. Mr. G. H. Cave, lately Curator of the Lloyd Botanic Gardens, Darjeeling, was appointed a Member of the Most Excellent Order of the British Empire.

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MR. H. N. HOWES, M.Sc., F.L.S., lately Economic Botanist, Department of Agriculture, Gold Coast Colony, has been appointed an Assistant in the Museums at Kew.

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MR. F. L. SQUIBBS, formerly of the Botanical and Forestry Department, Hong Kong, has been appointed Assistant Curator, Botanic Gardens, Dominica, British West Indies.

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MR. T. D. MAITLAND, M.B.E., has been appointed Superintendent, Botanic Gardens, Victoria, British Cameroons.

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MR. H. T. MACMILLAN, F.L.S., who recently retired from the position of Superintendent, Peradeniya Botanic Gardens, Ceylon, is now in Persia as Botanical Adviser to the Anglo-Persian Oil Co., at Abadan.

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MR. J. RICHARDSON has been appointed Superintendent of Parks at Salford, having resigned the position he formerly held at Mesnes Park, Wigan.

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MR. W. DUNK has been appointed Superintendent, Open Spaces and Gardens Department, Marylebone, London, W.

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MR. T. J. JOHNSON, lately Assistant, Horticultural Division, Delhi, India, has been appointed Superintendent, Government House Gardens, Bengal, a charge comprising the exquisite grounds of Calcutta, Barrackpore, Dacca, and Darjeeling.

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WE learn that Mr. L. F. RUSE, formerly Superintendent of the Government Gardens at Saharanpur, has been appointed Superintendent, Government Gardens, Lucknow, U.P., India.

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MR. A. E. P. GRIESSEN is returning to India to resume his duties as Deputy-Director of Agriculture, Garden Circle, Saharanpur, relieving Mr. W. Head, who has been officiating in his absence.

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Mr. A. J. HOPKINS has been appointed Head Gardener at the Villa Yolandot, Ospedalletti, Ligure, Italy, in succession to Mr. A. A. Cavanagh, who is proceeding to the Liebig Company's Yerba Maté Plantations, Territorio de Misiones, Argentine Republic, South America.

Mr. W. FRANKLIN has succeeded Mr. P. W. Conn as Foreman at the University Botanic Garden, Cambridge. Mr. Conn is now Superintendent of Bedwelty Park, Tredegar, Monmouthshire.

Mr. J. A. MCPHERSON has been appointed Curator of the Public Gardens and Reserves, Invercargill, New Zealand.

Mr. DALLIMORE has succeeded Mr. J. M. Hillier as Keeper of the Museums at Kew. A brief account of Mr. Hillier's activities will be found in the *Kew Guild Journal* for 1924, while reference to the 1926 issue will give many interesting details of Mr. Dallimore's career.

RETIREMENT of Mr. Robert Ward, M.B.E., Superintendent of Botanic Gardens and Agricultural Stations, British Guiana. (Reprinted from *Journal of the Board of Agriculture*, British Guiana, July 1926, p. 176).

"With the retirement of Robert Ward, M.B.E., from the service of this Colony, we have lost a botanist whose modesty has, perhaps, caused many to lose sight of the great work he has done for the Herbarium of this Colony.

"Mr. Ward has been so long associated with the Botanic Gardens that one can hardly visualise him in any other connection. Born in Perthshire, Scotland, on April 23rd, 1860, he served his apprenticeship in the Dunkeld Gardens, the property of the Dowager Duchess of Athol. When his journeyman'ship terminated, he entered the service of Dickson & Co., of Edinburgh, one of the principal Nurserymen in Scotland. He spent three strenuous years at Dickson's, where he learnt much of the practical work of gardening.

"He was still, however, determined to carry on his studies in Botany, and for this purpose he entered Kew on April 2, 1883. Here he did excellent work, becoming sub-foreman in the Decorative Department, and having under him men who have since become famous in the Botanical World. He spent over three years at Kew, and in 1886 came to British Guiana to take charge of the nurseries at the Botanic Station.

"When he arrived in this Colony no one knew anything about propagation work, potting of plants, pruning, and general garden work, with the exception of Mr. Jenman and Mr. Waby. Together with the

well-known botanist, the late George Samuel Jenman, F.L.S., the then Government Botanist, Mr. Ward set to work, and it was not very long before he transformed the existing nursery into something that the Colony could be proud of. It must be remembered that, at that time, he had to teach practical work to everyone, since not one of the labourers knew anything at all of nursery work. He was an expert at grafting and potting, and the raising of every kind of seedling. He found some of the East Indians apt pupils, and turned out several very skilled men. His capacity for downright physical hard work, we make bold to assert, has never been equalled by any man in this Colony, not excluding the great Sugar-King, William Russell. Tireless himself, he was able, in some mysterious manner, to infuse energy into all the men under him. It was not long before his skill and ability gained recognition, and he was offered the post of Botanist in one of our West African Colonies, This he accepted, but when he saw how much his chief grieved at the idea of his leaving, with the great work they had started not completed, he afterwards declined the appointment. Not long after this he was appointed to carry on under Mr. Jenman, and afterwards under Jenman and Professor Harrison, the important work of raising Seedling Sugar Canes. For this work, about the year 1901, he was specially thanked by His Majesty's then Secretary of State for the Colonies.

“When the new Department of Science and Agriculture was formed, Mr. Ward was drafted into this, and continued the work of raising Seedling Canes, and assisting in the training of farmers and others in practical Agriculture. Without Mr. Ward's help, we are very doubtful whether these experiments would have been carried to so successful an issue.

“The amount of sheer hard work he has put in with respect to these experiments is inconceivable! He was ever ready to put his Work first, and his Pay last. As long ago as 1888 Jenman, writing about the work in the Herbarium in one of his annual Reports, stated that ‘the classification has been completed by Mr. Ward, working on holidays and in unofficial hours.’ We have known him, for reasons that seemed good to himself, remain in the fields, day after day, from 6.30 A.M. to 9 P.M., weighing canes by lamp-light, so as to push on with work which was urgent. The extra pay for the men usually came from his own pocket. This may have been unwise, but it is characteristic of his whole life in the Colony. Utterly unselfish, devoted entirely to his work, and modest to a degree which bordered on being foolishly so, he was the most loyal of officers. His devotion to Jenman and Harrison had something in it that was almost pathetic. His æsthetic taste in flowers and his knowledge of tone-value in colours was most remarkable. There has never been anyone in this Colony who so thoroughly understood the culture of the grape. Again, out of his own pocket he imported and cultivated at the Experimental

Station a number of the most delicate varieties of grape, teaching the pruning of the vines to anyone who cared to learn. He grew most magnificent Black Hamburgs and other superior varieties with splendid success. Amongst his apt pupils was the late Mr. D. V. Jacobs, who, for a number of years, cultivated grapes quite successfully at Buxton, East Coast, Demerara.

“To Sir John Harrison, Mr. Ward was invaluable. On all Sir John’s trips into the Interior, Mr. Ward was his valuable companion. He also made several trips into the Interior in the interest of our local flora. He added materially to the collection of the very fine Herbarium at the Botanic Gardens here, and to Herbaria in many parts of the world. It was he who obtained seed of the rare and interesting palm, *Hyospathe elegans*, at Eagle Mountain, Potaro. His knowledge of plant-life was not confined to the practical side, though he will be remembered more especially in this connection. He has, also, a sound scientific knowledge of plant-life—sounder than many suspected.

“Mr. Ward took a very great interest in the Agricultural and Live Stock Shows held in this Colony, and only those who were associated with him know the amount of absolutely unselfish service he gave to make every show a success. It is of interest to note that Mr. Ward during all these active years of service has had but one holiday of six months, most of which was spent in a hospital in London, owing to a fracture of the arm, the result of a fall from his bicycle.

“Mr. Ward will be assuredly a great loss to the Colony, but, nevertheless, the good work he has done has already borne fruit. He deserves all the happiness which a man in sound health and vigour should secure after some forty years’ strenuous work in this Colony, in his honoured retirement from his duties. We trust that he will still favour the Board of Agriculture (of which he has been appointed a Honorary Member) with his advice from time to time.

“Recognition to workers often comes slowly, and where the modesty of a man is a marked feature it may be years before any appreciation is publicly expressed. It was not until quite recently that the distinction of the Membership of The Order of the British Empire was conferred upon Mr. Ward.

“To Mr. Ward, Work, with a very large capital, meant almost everything, Stern though he was in connection with Work, his Charity, given freely to all, is well known. Indeed, his kindness of heart was only equalled by his greatness in having an honest purpose in life. He recalls to us that famous line in Horace’s Odes : *Iustum et tenacem et propositi virum.*”



## KEWITES AS AUTHORS.

COTTON AND ITS PRODUCTION\*.—Cotton is essentially a subject for the expert, whether he be grower, shipper, trader, manufacturer, or author, and the opportunity to write a book on so important a Key industry falls to the lot of but few men. The author of the work under review left Kew in 1908, and, as he tells us himself in a prefatory note, much of the information given was collected during the twenty years in which he had charge of Agricultural Departments in West and East Africa, and during travels in Ceylon, South Africa, Rhodesia, Australia, and the United States of America. Practically every phase of the industry, in the course of its 536 pages, is covered—historical, botanical, countries of production, cultivation, marketing, diseases and pests, by-products, &c. The United States, India, Brazil, China, Russia, as chief producing areas are dealt with in full. There are two chapters on cotton production in the British Empire other than India, and one cannot fail to be struck with the developments made in recent years under the combined efforts of the British Cotton Growing Association (since 1902), the Empire Cotton Growing Corporation (since 1920), and the various Departments of Agriculture in the Colonies, where Mr. Johnson indicates great possibilities for further development still exist. When one considers that the largest producer—the United States—out of the immense production of more than 13,000,000 bales of 500 lb. each, requires at least 60 per cent. for her own use, and when proposals to reduce the area under crops and to reserve a matter of 4,000,000 bales in order to keep the price up to a certain standard, the advisability of maintaining an efficient and increasing standard of production within the limits of the Empire becomes self evident. Provided expenses of cultivation are kept within a reasonable figure it should be possible, in the not far distant future, to make Lancashire, our chief manufacturing centre, more independent than at present of supplies of raw material from foreign sources.

Another very useful feature is the excellent series of maps—26 in all—illustrating the cotton areas in each of the countries dealt with.

A long list of the principal and more recent publications on cotton most of which the author has consulted, concludes the work.

The value of the whole is enhanced by an Introduction by Sir Wyndham R. Dunstan, K.C.M.G., and a Foreword by Sir William Himbury (Managing-Director of the British Cotton Growing Association), both eminent authorities on the subject.

In general, the main facts of the past, present, and future of cotton are marshalled with advantage to the reader, bearing out, as stated in the Introductory Note, that "the book furnishes the most complete guide and encyclopædia which has yet appeared" on the subject.

\* 'Cotton and its Production.' By W. H. Johnson, F.L.S. Published by Macmillan & Co., Ltd. London, 1926. Price 30s. net.

**THE PRUNING OF TREES AND SHRUBS.**—This book, by Mr. W. Dallimore, gives an account of tree and shrub pruning as practised at Kew. Trees for all sorts of positions are dealt with, and the latter part of the work consists of an alphabetical list of genera of shrubs giving details of pruning required for various species. Although Kewites of late years are not apt to associate the author with practical cultural work, those of an earlier date think of him in no other capacity. The book includes numerous illustrations, and is published by Messrs. Dulau & Co., London, price 4s. 6d. net.

**AIMS AND METHODS IN THE STUDY OF VEGETATION\*.**—This work is the first publication of the British Empire Vegetation Committee, set up by the Imperial Botanical Conference, held in London during 1924. It is divided into three parts: General, Regional, and Types of Vegetation. The first deals with essentially ecological methods, terminology, the physico-chemical investigation of the habitat, biotic factors, and special groups of plants. The second part consists of five papers by as many authors, dealing with vegetation study in various parts of the Empire. The last part is composed of eight papers, each one complete in itself, by specialists on vegetational types characteristic of the different Dominions and India. The work is illustrated by 19 plates of photographic reproductions and some text-figures.

The editors accept in general the succession scheme and nomenclature for vegetation as put forward by F. E. Clements. In their conception of climax, however, they differ from Clements, in that they accept an edaphic climax in addition to a climatic climax. They do not state why a biotic climax should not also be recognised, when, as sometimes happens, "certain kinds of conditions of biotic factors make the development of the climatic climax permanently impossible, and may divert the succession into a different path." The word *permanently* is used in a relative sense. The climatic climax is stated to be "the highest type of plant community that can exist in a given climate," but the word "highest" may have several interpretations given to it.

The methods of studying the main groups of factors which mould vegetation are mostly summarized in a clear concise manner which is, however, sufficiently detailed for students with a general scientific training, to be able to adapt the processes in the field without the aid of other guides. An exception is the paragraph on hydrogen ion concentration which might well have been elaborated in greater detail. The chapters on Fungi and Lichens are interesting general accounts of the ecology of these groups, but are different in their context from the rest of the part in which they are placed. It is unfortunate that so many papers are referred to by authors and dates alone in the text,

\* 'Aims and Methods in the Study of Vegetation.' Edited by A. G. Tansley and F. F. Chipp (British Empire Vegetation Committee and the Crown Agents for the Colonies, 1926. Price 12s. 6d.).

but are omitted from the list of Select Literature at the end of the chapter. That portion of the work devoted to Seaweeds is a clear exposition of the methods of studying the ecology of this group.

The accounts of concrete study of various regions and types of vegetation from an ecological standpoint are naturally very varied. They certainly suffice to indicate the wide scope of the science, the material available for many workers, and the variety of methods and basic schemes which may be used.

This book, which is extraordinarily good value for the price, should be in the hands of every student of vegetation in the British Empire. Beginners will find it the best introduction to the study of plant ecology yet published, and even professional ecologists will find it of value. It is an indication that the study of living plants and vegetation, as apart from mere herbarium and floristic work, is going to be undertaken seriously in the widely-scattered Dominions and Colonies of the British Empire; and, it may be added, that Kew is prepared to aid with her great resources and unifying central position in co-ordinating the work of the numerous field-workers, without whom no results can possibly be obtained.

W. B. TURRILL.

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#### KEW NOTES AND GLEANINGS.

THE total number of visitors to the Royal Botanic Gardens, Kew, during the year 1926 was 1,162,547—a decrease of 509,293 on the figures of the previous year. It should be borne in mind, however, that on January 1st, 1926, the penny charge for admission was re-imposed on the recommendation of the Select Committee on Estimates. The charge was discontinued in April 1924, and subsequently no bar was placed on the right of re-admission, in consequence of which the public made full use of free access to the Gardens. The period of restricted railway and transport services while the General Strike and other industrial disputes were in vogue (from May onwards) doubtless affected attendances very considerably. Comparative figures for the years when charges were in vogue are given:—

1922.....	1,143,758
1923.....	1,186,662
1926.....	1,162,547

The greatest monthly attendance was during April, the figures being 214,415; the highest Sunday attendance 22,589 (July 11) and the greatest single-day record 62,117 (April 5). The lowest monthly record was December, with 9,937 visitors, the lowest Sunday numbers 409 (February 7), and the lowest weekday attendance was 18

(January 22). Visitors on Sundays totalled 475,076 and on weekdays 687,471. 1,248 bath-chairs and 9,293 perambulators were admitted to the Gardens on payment, in addition to many admitted as season-ticket holders. That advantage is taken of the educational value of the Gardens by the authorities in the neighbourhood (particularly in the London area) is emphasised by the fact that school parties aggregating upwards of 15,000 were admitted at specially reduced fees.

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A consignment of native British Trees, comprising Beeches, Oaks, Alders, Horse-chestnuts, Elms, and Cricket Bat Willows, was recently dispatched, per the S.S. 'Balranald' to the Sydney Botanic Gardens. Should the plants arrive in Australia in a suitable condition, it is intended that they shall be planted at Canberra by the Duke and Duchess of York and other notabilities on the occasion of the opening of the new Parliament Buildings, and that they should form the nucleus of plantations which are to be established there. The plants were placed in the vegetable chamber on board the steamship, and it is not anticipated that they will be subjected to a higher temperature than 40° Fahr. during the voyage, so that high hopes are entertained of their safe arrival.

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AN event of more than usual interest during the past summer has been the flowering of a fine specimen of *Amorphophallus titanum*, Beccari, the giant aroid of Sumatra. During the summer of 1925 the plant sent up a leaf to a height of about eleven feet, the circumference of the blade being about eight feet. In 1926 the plant commenced to grow in the second week of May. From July 23rd daily measurements were made of the height of the developing flower. On this date the height was 2 feet 11½ inches. For the next week growth was very rapid, from three to four inches a day. The rate of growth then diminished, the height on August 1st being 5 feet 5¾ inches, and on August 4th, when the spathe opened, 5 feet 9 inches.

The spathe commenced to open at 9 A.M. on August 4th. By 2 P.M. it was fully expanded, and emitted a nauseating stench. Measurements at 2 P.M. were:—Spadix, 4 feet 9 inches long, 11½ inches diameter; spathe, 3 feet 3 inches long, 3 feet 9 inches diameter; peduncle, 1 foot long.

At its period of fullest development the plant presented a handsome sight, the reflexed inner surface of the spathe being of a dark chocolate-brown, the spadix butter-yellow, the outside of the spathe was pale greenish yellow, and the peduncle dark green mottled with a lighter shade.

- The flower remained opened and in good condition until noon the following day, when it began to close. The spathe withered and the spadix collapsed finally some two days later. (Reprinted from *Kew Bulletin*, 1926, pp. 374-375.)

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For many years a collection of pictures and plans relating to the Royal Village of Kew, and to the early history of the Gardens during the latter part of the eighteenth century, have been exhibited amongst the botanical pictures in Museum III, at Kew.

These pictures relate to the period when H.M. Queen Caroline, H.R.H. the Princess of Wales (Augusta of Saxe-Gotha), and the Earl of Bute, H.M. King George III., and Sir Joseph Banks took so great an interest in the Royal Gardens, and when Sir William Chambers was engaged to design several of the buildings.

It has long been felt that this interesting historical collection should be more adequately displayed, and on learning that some alteration was contemplated in the arrangement of the pictures in Kew Palace, permission was sought for their exhibition in the building around which so much of the early history of Kew and the Gardens has centred.

H.M. the Queen has been pleased to convey the King's gracious permission for the pictures to be displayed in the Palace, and they have now been hung in the King's Antechamber and in the King's Bedroom. (Reprinted from *Kew Bulletin*, 1926, p. 369.)

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MR. WILLIAM HALES, A.L.S., who recently was elected Chairman of the Kew Guild Committee, has always been associated with tropical plant-life, and we are very pleased to note that the Trustees of the Chelsea Physic Garden have expressed their deep appreciation of his services, and have arranged for a tour of the Tropics to be undertaken by him. Mr. Hales left England early in December last *en route* for Ceylon. While there visits will be made to Kandy, Peradeniya, Nuwari Eliya, and other important horticultural centres. From Ceylon the itinerary will be *via* Penang, Ipoh, Kuala Lumpur, Singapore, Batavia, Buitenzorg, Garvat, Djoeka, and Sourabaya. From Java Mr. Hales will return home *via* Singapore. All Kewites will join in congratulating Mr. Hales on his good fortune and in wishing him *bon voyage*. Doubtless Mr. Hales will be willing to contribute an article to a future issue of the *Journal*, when many interesting details of the wonders of tropical gardens will be disclosed by his able pen.

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MR. and MRS. TURRILL had another very successful trip in the Balkan Peninsula last summer. Over 600 botanical specimens and

more than 200 packets of fruits and seeds were brought back to Kew. They crossed the Rodope mountains from Bulgaria to Greek Thrace, exploring large areas which had never been visited previously by botanists. A noteworthy discovery was the presence of the Oriental Beech (*Fagus orientalis*, Lipsky) in a valley in the southern Rodopes. Later Musalla was visited and many endemics were collected, including *Primula deorum*, Vel. The highest peak of the Balkan Peninsula was climbed in a bitterly cold wind-storm. From Musalla the Rila Dagh was crossed, and a four days' stay in the Rila valley resulted in the discovery of the fine new species, *Anthemis sancti-johanni*, recently described in the *Gardeners' Chronicle*. Varna, on the Black Sea, was reached via the Isker Gorge and the North Bulgarian Plain. A full investigation of the interesting flora of the Black Sea coastal district preceded visits to Burgas, the Bosphorus, and Constantinople. The return journey followed the route Adrianople, Svilengrad, Sofia, Lom, up the Danube to Vienna, and thence home through the Tyrol, Switzerland, and France.

## KEW METEOROLOGICAL NOTES.

	Rainfall in inches.	Temperature.	
		Maximum.	Minimum.
1926.		F.	F.
January .....	2.47	53°	11°
February .....	2.47	59	24
March .....	0.16	60	26
April .....	2.94	71	28
May .....	1.99	78	27
June .....	3.03	76	39
July .....	2.06	87	47
August .....	0.99	81	42
September .....	1.30	90	29
October .....	2.08	70	21
November .....	5.11	56	24
December .....	0.36	52	19
Total Rainfall for 1926 ..	24.96	—	—

The rainfall for 1926 showed an increase of .45 inches compared with 1925. Severe frosts were experienced in January, on one occasion 21° of frost being recorded. The hottest day (September 19), when 90° was registered as shade temperature, was followed by the first frost of the autumn one week later. March and August were unusually dry, also May. On May 13, however, a heavy downpour resulted in the fall of more than an inch of rain. The rainfall for the month of November (5.11 inches) is the heaviest fall since records began at Kew, while December's fall (0.36 inches) is the lowest.

## WEDDING BELLS.

Mr. Harry Maw	to Miss Agnes Torrance Macaulay at Clapham, London, S.W.....	Dec. 5, 1925.
Mr. J. A. Robertson	„ Miss Grace Wardell at Christ Church, Richmond . . . . .	April 29, 1926.
Mr. M. Free	„ Miss Maude Hickok at Brooklyn, N.Y., U.S.A. . . . .	June 5, 1926.
Mr. W. M. Campbell	„ Miss M. V. Avery at Putney, S.W.	June 5, 1926.
Mr. C. V. B. Marquand	„ Miss Ivy Constance Groves at Croydon . . . . .	July 12, 1926.
Mr. G. O. Flynn	„ Miss Gladys C. Coleman at Han- well, Middlesex . . . . .	July 28, 1926.
Mr. J. J. Mackintosh	„ Miss Grace Ellen Cheetham at Manchester . . . . .	Sept. 15, 1926.
Mr. F. B. L. Butler	„ Miss Norah Cecilia Farmer . . . .	Oct. 19, 1926.

## THE CANADIAN MEDAL OF HONOUR.

ON the occasion of the Convention of the Canadian Florists' and Gardeners' Association, held at Port Stanley, Ontario, on July 28th, 1926, Mr. E. B. Luke, President of the Canadian Horticultural Council, presented to Mr. Henry J. Moore, who left Kew in August 1907, the Carter Medal. This annual award is known as the Canadian Medal of Honour, and is presented to those who advance the cause of horticulture in Canada, and is recognised as the premier award in this respect throughout the Dominion.

Mr. Moore is now Lecturer in Horticulture to the Province of Ontario, having been appointed in May 1924. Fellow Kewites will learn with pleasure of this distinction that has been conferred on one of their number, and we offer our congratulations to Mr. Moore upon the award.

## OPENING VISTAS.

The leaves come down, the gold and crimson leaves,  
Seeking a winter bed the leaves come down;  
The trees stand in the garden bare and brown,  
Summer is dead, and Mother Ceres grieves.  
Lo, now the flowers fade! Bright crystal tears  
Sparkle upon the early morning grass.  
The year is weeping for her youth—*Tout passe!*  
We, too, shall falter 'neath the weight of years.

The leaves come down. Alas! the trees are stripped.  
But stay; between those branches brown and sere  
The hills (in soft blue misty lines) appear  
With purple slopes and summits golden tipped.  
Thus age doth bring us solace for its ills—  
The leaves come down, and we can see the hills.

D. E. STEVENSON.

(*Chambers's Journal*, November 1926.)

### THE NEW PINETUM AT BEDGEBURY.

ON several occasions during the last two years, notes have appeared in the *Kew Bulletin* and other periodicals about the new National Pinetum that is being formed at Bedgebury, and as Kew is chiefly responsible for that Pinetum, a short account of the undertaking may be of interest to Kewites.

The project of forming a new National Pinetum became necessary owing to the increasingly difficult problem of cultivating conifers in the vitiated atmosphere of Kew. This, together with poor and dry soil, had for years made the satisfactory growth of certain kinds, particularly the silver firs and spruces, impossible, and it became necessary to seek a place where better atmospheric, climatic, and soil conditions prevailed.

The difficulty of financing the scheme was solved by the Forestry Commission offering a selection of sites in their forest areas. Moreover, the Forestry Commission agreed upon a joint project of a Pinetum and a series of Experimental Forest Plots, under the control of a Committee composed of Forestry Commission and Kew representatives; H.M. Treasury agreeing to the expense of formation and upkeep being jointly borne by the two interested bodies.

After visiting several sites, that at Bedgebury was selected as being the most suitable. Bedgebury is situated on the borders of Kent and Sussex, in the triangle formed by Goudhurst, Cranbrook, and Wadhurst, and has the advantage of being in the midst of very beautiful surroundings. The estate was formerly one of the most renowned of the many fine private properties of Kent. The mansion, a very large and imposing structure, is surrounded by fine gardens, a well-timbered park containing a lake, several acres in extent, and further afield by some 2000 acres of woods, plantations, and farmlands, the whole well-watered by numerous brooks and several lakes.

After various vicissitudes, the estate came into the hands of H.M. Woods and Forests some time after the Armistice, the mansion became a young ladies' school, and the woods and plantations passed into the hands of the Forestry Commission. Had the country been searched through, it is doubtful whether a more satisfactory place could have been found for a National Pinetum. Such a place must be within a comparatively short distance of London, it must possess good soil that will never become very dry, and the climatic and atmospheric conditions must be satisfactory. All these conditions are found at Bedgebury, and, in addition, the land is undulated and lends itself to landscape effect. That the soil suits conifers is very evident from the many fine trees growing about the estate that were planted from 40 to 60 years ago.

An effort will be made to include every hardy species of conifer, and provision is being made so that every plant can develop without



being crowded by its neighbours. Whenever possible six plants of a species are planted and three plants of a variety. The stronger growing kinds are planted from 20 to 35 feet apart, others are spaced as necessary. Several avenues have been left through the 50 acres at present under treatment, the widest one being 100 feet wide and narrower ones 30 feet to 60 feet. With avenues of these widths it is considered that there will be ample space between the trees when they are fully developed. A record is being kept at Kew of every tree planted, and it is arranged that measurements shall be taken every five years for the first 25 years at any rate. All the plants have been provided by Kew, and Kew is responsible for the scientific side of the work.

The first trees were planted in March 1925. These were followed by other plantings in February 1926, and November 1926, and further additions will be made when necessary. The forest plots have not yet been started.

#### WHERE THEY ARE AND WHAT THEY ARE DOING.

Mr. WILLIAM LESLIE writes from Toowoomba, Queensland:—"In spite of your grumble about the difficulty of obtaining sufficient copy to maintain the high standard of our *Journal*, the 1926 issue is one of the most interesting yet published. In order that some copy may be forthcoming from the lands of the Southern Cross, I am sending along these few notes for inclusion in the next number.

"I recall my early days in Trinidad and wonder what great strides are being made at the College of Tropical Agriculture there. This institution may be said to have originated, to no small degree, in the old Victoria Institute. In 1905 or 1906 a mild sensation was caused in the Government House Gardens when the *Victoria regia* flowered for the first time.

"The notes on Kumasi in the last issue of the *Journal* are of great interest. When I was stationed on the Gold Coast one of my particular endeavours was that of teaching the gold-bedecked chiefs to cure their cocoa properly. At that time martial law was still in vogue, out of respect to the warlike tendencies of the Ashantis. In response to an invitation from the Commissioner—then Captain Armitage—I proceeded one evening to the old fort for a few hours' relaxation. I found a sentry ready to stop intruders, but a glimpse of my white skin, harmless appearance, and the sound of my voice were sufficient to re-assure him of my intentions. Time and people have caused many changes there also—now there are railways and motor roads—yet I can recall but bush tracks.

"Australia! What of it? It can be said without fear of contradiction that this country is easily the healthiest and happiest land I have ever visited, and in particular the State of Queensland. Nearly

everyone out here has magnificent flower gardens, and the homes of even the engine drivers and railway porters in Toowoomba are comparable with the best suburban houses around London. Every Tom, Dick, and Harry spends his leisure moments in the garden, but few care or need pay a gardener 14s. for a day of seven or eight hours. In Toowoomba, a city of about 28,000 inhabitants and some 5000 houses, each with gardens varying from 20 poles to 20 acres in extent, there may be a dozen gardeners constantly employed, excluding those in the public gardens. Yes! we have quite a good Botanic Garden here, and although the Curator is not a Kewite, he is perhaps the next best—a really first-class English gardener, very skilful in artistic landscape art, and who attains a measure of success in embellishing the city gardens and open spaces. The streets, too, are well furnished with ornamental shade trees. It may be an item of interest to devote a few lines to mentioning a few trees which are used for the latter purpose. Our principal shade-tree and wind-break is the Camphor Laurel (*Cinnamomum camphora*); planes, conifers, and wattles too are usually employed, together with the Pepperina (*Schinus molle*).

“Fruit trees are my chief interest nowadays, and the Government has assigned me a post as Instructor in Fruit Culture. My duties are almost entirely to assist fruit farmers in combating pests. Fruit fly and scale insects are the chief concern in this district. The early varieties of apricots and peaches escape the fruit-fly maggot; but it is almost impossible at the present time to secure good crops of the mid-season varieties, owing to the ravages of this pest. Some garden enthusiasts put mosquito netting over their trees and secure maggot-free fruit at double the cost the choicest fruit from other districts can be purchased in the local market! Others, however, take a sporting chance, only to have to feed their pigs with all their later varieties.

“Young present-day Kewites could do much worse than to cast their cares for ordinary garden work to the winds, and come out to Queensland. Here, in a delightful climate, together with plenty of hard work, bananas can be grown for home consumption, and, given reasonable success, an income of £200 to £2,000 per annum is assured. Others, who do not care to take the risk, might qualify as plant inspectors under the Plant Diseases Act, and would ultimately become instructors in fruit culture at a salary of from £320 to £380 *plus* liberal travelling allowances. The Department of Agriculture is a real “live wire”; there are twelve inspectors and seven instructors in the sub-department of Fruit Culture. In the Stock and Dairying section, there are about one hundred and thirty similar officers; in Cotton, fifteen; in the Sugar section, about one hundred; and in the section dealing with General Agriculture, there are about fifty officers. These numbers do not include purely scientific and clerical staff. The ranks of these officials are readily filled locally, though there is no stipulated training institution for would-be candidates. The Department of

Agriculture is subdivided into the following sections, each dealing with its own special interests:—Agricultural Chemistry, Cotton, Fruit, Stock, Sugar, Seeds and Fertilisers, Dairying, Publicity—including Photography, Wool, Entomology, and Agricultural Banking and Accountancy.”

Mr. T. D. HATFIELD writes:—“Looking back some fifty years one forgets a great deal, especially the names of old acquaintances. I entered Kew in 1877 when I was 21 years of age. Mr. Nicholson was in the office and with him Mr. Smith—the Smith who was formerly at Syon. I was sent to work in the ‘yard’ under James Seward, who was then foreman, and a more disagreeable man I have never since met. I did not get on at all well in this department and when the opportunity presented itself I promptly asked for a change, and was transferred to the Propagating Department under ‘Dicky’ Lynch, and later to the T. Range, where I had charge of the Begonia and Cape Houses. Later I was promoted to deputy-foreman and had charge of the Tropical Plant Houses. After a year’s stay, Mr. Smith decided that it would be advisable for me to learn something of fruit culture and persuaded me to go to Syon House.

“Recollections of Kew, some rather serious, others comical, that come to my mind I will relate as they come to me haphazard. I hadn’t been long in the ‘yard’ when Bill Crisp, the packer’s grandfather, asked me where I came from, and when I said Hull (evidently by me pronounced ‘Hool’), he asked me whether my people kept ‘dooks.’ I was much offended at this, and I don’t think we were ever really on friendly terms while at Kew. Then there was Paddy Culkin, a real Irishman, but as much a Kewite as the rest of us where Kew was concerned. He was odd man in the yard, and one, Pantling by name, who worked in the paintshop, was always at loggerheads with him, and we fellows did all we could to keep up the unpleasantness. While in the yard I had charge of the Cape bulb house, but as most of the plants were dormant at the time they were of little interest to me, but to the late Henry Elwes they were a great source of pleasure. He bothered me quite often as to cultural methods and interested me with stories of his world-wide travels. Somehow or other Mr. Elwes took a liking to me and offered to help me when seeking a situation on leaving Kew. I was then 21 and I suppose a man of 40 looked old to me. Some years later, my late employer, Mr. Walter Hunnewell, told me that Mr. Elwes and Dr. Henry were visiting the estate, and I expressed great surprise, for in my estimation Mr. Elwes was quite 100 years old, and I was much interested to learn that at that time he was but 74.

“One Sunday morning two of us were ‘bathing’ in the *Victoria Regia* tank when a small girl and her mother surprised us. This young lady proved to be Princess Mary of Teck, the present Queen of England.

“Sir Joseph Hooker visited the United States and spent a great deal

of time travelling about the country together with Professor Asa Gray. On his return he wrote up his travels and gave his first lecture before the Kew fellows as he said that, 'his first duty was to us,'—anyway it was remarked that we were good enough to practise on!

"I can't say that I was personally acquainted with Charles Darwin, but once he gave me a note to take to the Herbarium. Darwin wrote a book on 'The Movements of Plants,' and in this connection 'Dicky' Lynch asked us all to note anything unusual, and I remember that one observation I made proved new to science, that being the drooping at night of the leaves of *Euphorbia fulgens*."

Mr. J. A. MCPHERSON writes from Granity, West Coast, New Zealand:—"My nursery is situated at Granity, on the sea coast. The climate is very mild with an abundant rainfall. Flowering trees and shrubs, pines, and gums are grown for distribution to the miners who comprise the population of this district, and for general use in beautifying the surrounding townships. The two towns adjacent to this place are Millerton, which is built on a hill some 800 feet above Granity, and Denniston, a little farther south, at an elevation of 2000 feet. At Millerton almost any hardy tree and shrub can be grown, but at Denniston the conditions are too severe, the town being on almost bare rock, and the rainfall for the half-year just ended was recorded at 89·55 inches! 6¼ inches have been known to fall in less than 24 hours. Wherever soil can be found at this latter town, trees or shrubs will be introduced. Street trees are an entirely hopeless proposition owing to the rocky ground. An idea of the prevailing conditions will be better conceived when I tell you that of all the electric light and telegraph poles erected in Denniston, only three holes had not to be dynamited! I use a horse to ride to Millerton but take train and car to Denniston. The towns in the vicinity owe their existence to the coal mines which are owned by the Westport Coal Company.

"It will be of general interest to know that the best steam coal in New Zealand is obtained right on the tops of the hills. Often when roaming over the hills one comes across big outcrops of first-class coal. There are no pits or pitheads with shafts as one sees in England. The seams are worked directly into the hillsides on an easy gradient. The full trucks coming out pull the empty ones into the workings. Some of the seams are 30–40 feet in thickness, and no seams are worked under 5 feet. The miners in New Zealand have few of the difficulties to contend with such as the English miners have, and in good ground they readily earn £2 or even more per day, payment being made in accordance with the output.

"It may be an item of interest to fellow-readers to know that Mr. David Tannock was Superintendent of the grounds and courts connected with the New Zealand and South Seas Exhibition,

Mr. M. J. Barnett is now Curator of the Public Gardens at Oamaru and is making a name for himself."

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Mr. A. W. MAYNARD, Assistant Curator of the Hamilton Park, Bloemfontein, South Africa, who left Kew in April 1914, was chosen as the representative of that city to attend the unveiling ceremony of the South African National War Memorial at Delville Wood on October 10th, 1926. The following extracts from the *Bloemfontein Friend* of September 8th, 1926, may be of interest in connection with this unusual honour which has been accorded to a fellow Kewite.

"Mr. Maynard is a gardener by calling—it is his boast that he comes of three successive generations of gardeners. He received his training at Kew and was brought out by the late Dr. H. H. W. Pearson, Honorary Director of the National Botanical Garden at Kirstenbosch, in the Cape Peninsula, to assist him there. That was in April 1914. Then the War broke out. Mr. Maynard responded to the call for recruits, but was repeatedly rejected on medical grounds. In October 1915, he was, however, accepted for garrison duty for the duration of hostilities, and served with the Cape Peninsula Rifles, 9th Infantry Regiment, in the Cape Peninsula for 318 days. After many applications, he was given a transfer to the 1st South African Infantry and proceeded to Europe.

"He served in France for two years and 208 days, *i.e.*, from October 11th, 1916, onwards. He was demobilised at the dispersal camp at Maitland on April 8th, 1919, after having served for three and a half years in all. He then returned to his work at Kirstenbosch for a time, after which he was appointed municipal gardener of the Queenstown Municipality. There he stayed for about a year, and then became Assistant Horticulturist (to Mr. Frith) of the Railway Department at Johannesburg. From there he came to Bloemfontein in April 1920.

"Private Maynard, as he remained to the end, saw a good deal of fighting in the war. He took part in the offensive at Arras in February 1917, but came through unscathed. He was present at the battles round Menin Road and Ypres in September of the same year. After the latter engagement he was taken from the trenches suffering from 'G.S.W. gas shell mustard'—so the Army Medical Corps reported on his case. For this he was detained in hospitals in Etaples and Rouen for four months. He rejoined his regiment in time to be in the thick of it when the German offensive of March 1918 was launched. He was taken prisoner and had to spend nine months in prison camps. During that time he was sent to work in coal mines at Wurslen near Cologne. He was repatriated to England *via* Holland two weeks after the signing of the Armistice."

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Mr. S. F. OVENDEN writes from La Mortola, Ventimiglia, Italy:—  
 “The Gardens of La Mortola are very beautiful, and contain excellent collections of plants, in which subtropical species predominate. I am learning the Italian language in my leisure moments, which should be particularly useful to me, although unfortunately the peasants here do not speak a pure rendering of it, doubtless owing to the close proximity of the French frontier.

“When I came here in July last the weather was unusually hot, and all my time was taken up watering the collections under my care. Many thousands of plants are grown annually for spring bedding displays, and I must say that the decorative side of gardening is thought more of than the purely botanical. Everything has to be grown in pots, and it is an easy matter to imagine the routine work that is necessary to bring them through the heat of an Italian summer.

“The Primulas are now being put out (Nov. 21), and by the New Year will be almost over. Cinerarias and Cyclamen will take their place, and by the end of April these, too, will be finished. I sometimes wonder whether the labour spent in their production is worth while for so much transitory glory, when considering what is possible with plants of a more permanent nature! La Mortola, however, is in keeping with all other estates on the Riviera, and must necessarily outstrip her neighbours in the matter of spring blossoms. I have no doubt but that it will be a perfect paradise of colour in the early months of the year, and will make a whole-hearted appeal to all who are fortunate enough to see its glories. I am quite sure that the fame of these Gardens is well established, solely, perhaps, on account of the glorious displays of early spring.

“Mr. Braggins is an excellent man, and it is wonderful the amount of work he gets done in the course of the year. Wine-making and olive-oil production do not fall to the lot of every head of such an establishment as this, but here they are just part of the routine. A fair quantity of grapes are grown, and there are many old olive-trees on the estate—some must be at least 300 years old. The olives are being pressed at the present time in a very old water-mill that has served this same purpose for hundreds of years. Although very primitive its effectiveness is extraordinary. A large stone wheel, turned by the stream outside, revolves in a vertical position in what is really a huge stone mortar. This gradually crushes the ripe fruits, and afterwards the whole sticky mass is placed into rope bags and squeezed in a press. The crude oil runs off into wooden tubs, and after standing for several hours, the surface is skimmed and the oil filtered several times before being finally ready for use.

“Last Sunday I was at the Villa Yolandot on a visit to Cavanagh and Hopkins. Cavanagh left here on Wednesday for England and the Argentine, and now Hopkins has the trials and adversities of Italian gardening with Italian labour before him. He is bound to find life a

little monotonous at first, but there will always be much to do in his work, and time passes very quickly in this delightful climate.

“The rain we have had lately has freshened everything considerably, and many plants are in full flower. *Tecomaria capensis* is a mass of brilliant scarlet blooms, and *Hakea laurina* is extraordinarily beautiful too. The scarlet and yellow berries of *Cotoneaster pannosa* and *C. angustifolia* are very pleasing sights also, more especially when our thoughts fly back to Kew and its early winter fogs!”

Mr. C. S. WALSH writes from San Rafael, Province of Mendoza, Argentine, South America:—“I was very pleased to receive my copy of the *Journal of the Kew Guild*, which is full of interest from cover to cover. My attention was particularly drawn to the note by F. G. Walsingham, writing from Florida, U.S.A., stating ‘that when the opportunity occurs’ he hopes to go to Central or South America. I asked myself, ‘Why do not Kew men come to the Argentine?’

“I have only met one Kewite out here, J. Schön, a successful nurseryman in Florida F.C.C.A., near Buenos Aires. We spent a very pleasant evening together some few months ago, and I am looking forward to seeing him again when next I visit Buenos Aires.

“Perhaps Walsingham and others may be rather doubtful as to the prospects here. My opportunity came when a firm in England asked me to come out to Buenos Aires on a business venture which would only occupy from two to three months. This would give me ample time to learn the prospects offered in the Argentine, so therefore I accepted their offer on condition that I would be free to terminate the engagement should a more suitable berth present itself. I found many opportunities, my only difficulty being that I could not speak a word of Spanish. In spite of this I had several offers, including that of Director of Experimental Stations for the Buenos Aires and Pacific Railway Company, which I now hold. We have three Stations, of which I have the supervision and direction, the principal one being Rama Caida, near San Rafael, Provincia Mendoza. This is approximately 500 acres in extent, and is devoted to fruits, vines, cereals, potatoes, etc. We have started a nursery for raising forest and ornamental trees and shrubs, and hope to find suitable subjects for planting in this province. We have also grafted some 150,000 fruit stocks during the present year. Our Monte Coman Station is devoted to fruit (apples, pears, plums, cherries, etc.), and contains probably the largest collection in the Argentine. Here records are kept as to their suitability to the climatic conditions and usefulness for commercial and export purposes. Our Godoy Cruz Station is devoted entirely to the cultivation of vines.

“Whilst opportunities may be found in any province in the Argentine, I am perhaps better able to speak of the Province of Mendoza, insomuch as my activities are at present confined to this

region. Irrigation is the life-blood of the province. The total area under irrigation is 577,839 hectares, of which 277,139 hectares are devoted to fruit and vine culture, the latter occupying some 78,000 hectares. There are some 685,865,400 kilos. of grapes harvested, from which 502,531,404 litres of wine are produced. Of this quantity, 405,318,400 litres are exported. The appropriate quantity of fruit exported to the U.S.A. and Great Britain is 1,512,000 kilos. There is no doubt, whatsoever, that this province has great possibilities. In the last decade, shipments of fruit from San Rafael alone have increased from 250 tons to 9000 tons: these figures alone speak for themselves.

“The climate is excellent, and particularly suited for fruit-growing. As opportunities offer themselves, I visit the large fruit-plantations, many of them owned by Englishmen. Thousands of trees are still being planted annually. The cultivation of pears seemed especially suitable to this area, and there is every indication of a large increase in the quantity available for export. Should any Kewite have the opportunity to come out to the Argentine, my advice to him would be not to hesitate, but one point that should be borne in mind is to learn the outlines of the Spanish language first, as this is half the battle on the road to success in this country.”

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#### A VISIT TO THE UNITED STATES AND CANADA.

AFTER a remarkably smooth and pleasant voyage on the S.S. ‘Caronia’ in company with Dr. A. B. Rendle, Dr. E. J. Butler, Dr. Ostenfeld, of Copenhagen, Mr. Sprague, and other botanists, the troubles of landing at New York and battling with the Customs authorities somewhat marred the end of this portion of our journey to attend the International Congress of Plant Sciences at Ithaca, New York State. Dr. N. L. Britton, Director-in-Chief of the New York Botanical Garden, kindly met me at the Quay with his car, and dispelled all unpleasant remembrances of the landing formalities with a luncheon of soft-shelled crabs, mushrooms—now largely grown in disused brewery cellars,—and other gastronomic delights of the great city. This was followed by a tour of the New York Botanical Garden, where we formed one of the constant stream of motor-cars which perpetually race through the Gardens and destroy all chance of peace and enjoyment near the main roads, which run in various directions through the grounds.

The journey to Ithaca was made the same night, and one thus had the first experience of the American sleeping-car, in which during my tour I spent seventeen other nights. The first night enabled me to discover all the drawbacks of the arrangements, which on the whole are few compared with the advantages. The longitudinal berths are comfortable and roomy, though sometimes rather short, but the arrangements for washing and dressing might well be improved. Woebetide the traveller who happens to forget the number and position of his berth,



for he may well find himself in somewhat of a Pickwickian dilemma. The long cars are occupied both by men and women, and it is thus neither discreet nor permissible to peep through the green curtains along the dimly-lit corridor in the hope of finding one's own location. The only method in such a case is to hunt painfully and silently below the berths until one's own boots or shoes can be discovered.

The week at Ithaca—Cornell University—was a week full of botanical activity, as I met and talked with nearly every American botanist as well as with many from Europe, some of whom were old friends of Kew, and with most of whom Kew had at some time been in correspondence. Fortunately everyone, aliens as well as citizens of the States, wore large labels with their names and country of origin printed on them, so that when one's memory failed, as it often did among so many new faces, it was always possible to go up to a delegate and read his name before committing an egregious blunder!

On one of the excursions to a boggy piece of country near the town, it was of great interest to find *Sarracenia*, *Drosera*, and *Parnassia* growing with several species of *Vaccinium*, as well as the saprophytic *Monotropa*, *Trillium*, *Actæa*, and various Orchids, etc., while *Taxus canadensis* was found growing in deep shade, and on the higher ground *Monarda*, *Asters*, *Solidago*, *Waldsteinia*, and several species of Rubi were abundant.

At Ithaca I had the pleasure of meeting H. M. Blanche, our Old Kewite, who is now holding the distinguished position of Chief Forester, Finger Lakes State Park Commission, Ithaca, and I was pleased to see several examples of his good work in connection with the preservation of the many beautiful public parks and reserves in this portion of the state.

In the small garden attached to the Horticultural Department of the University some interesting plants were to be seen, and various genetical researches were being carried out; there is, however, no proper Botanical Garden connected with the University.

Leaving Ithaca at the close of the Conference, I journeyed to St. Louis, to visit the Missouri Botanical Garden, where, under the guidance of the Director, Dr. George T. Moore, and Mr. G. Pring, late of Kew, I spent a very enjoyable day. The last Director of Kew to visit Henry Shaw's well-known garden was Sir Joseph Hooker in July 1877, when he was in America making his botanical tour with Asa Gray (see *Kew Report*, 1877, p. 7).

The Missouri Garden is a garden in the proper sense of the word, since it is enclosed by walls, and visitors must enjoy its beauties on foot, nor can it be entered at night. Here Orchids are among the principal plants cultivated under glass, though many other subjects are well represented. The tropical day-flowering water-lilies, with *Nelubiums* and *Victoria regia* flowering freely in the open, are among the most interesting features.

Owing to the smoke of the great city, it has been found necessary to find a new site for the Garden, and this, which lies some 38 miles away, I visited with the Director and Mr. Pring. A fine site of several hundred acres has been acquired and is as yet undeveloped, but a large range of Orchid-houses has been erected, and some of the houses are already occupied by the collection of Cattleyas and Odontoglossums. Before many years are past the new Botanical Garden should be a place of pilgrimage for botanists and horticulturists.

The difficulties in the way of successful gardening, both at St. Louis and New York, are very great, and it is difficult for anyone accustomed to our suave conditions to appreciate them fully. With a summer temperature at St. Louis rising to 110° F. in the shade and falling to about 30° F. below zero in the winter, one can understand that, after all, the lot of the British gardener is a fairly happy one.

From St. Louis, I journeyed two days and three nights to the Grand Canyon, arriving there about 8 A.M. on the Friday morning. The ride on muleback to the Colorado River, 4000 ft. below the rim, was a wonderful experience, especially as the back of the mule was at an angle of 45° or more with the horizontal most of the way. Even in this position, however, I was able to gather *Fallugia paradoxa*, *Lobelia cardinalis*, and scarlet Pentstemons in flower.

Rejoining the train the same evening, I journeyed on towards Los Angeles, passing through the Mojave desert of S. California, inhabited by the remarkable giant tree Yuccas, *Clistoyucca arborescens* (see *Kew Bulletin*, 1926, p. 69), which cover many thousands of acres and create the impression that one has suddenly been transported to another planet.

Before reaching Los Angeles, I was met at San Bernardino by Dean Elmer D. Merrill, Dean of the College of Agriculture, University of California, who was my kind host at Berkeley, and motored through the Orange-, Lemon-, and Palm-groves of Southern California, visiting on the way the magnificent Cactus garden of Mr. Henry P. Huntington at El Molino.

At Los Angeles a lecture had been arranged, and I endeavoured to encourage the citizens who were interested in such stationary objects as plants, rather than in objects or subjects in motion, to establish a botanic garden in this wonderful climate, where, provided water can be obtained, almost every plant from the temperate and subtropical regions can be grown to perfection. A few days ago I heard from Los Angeles that the Mandeville Canyon, which I visited, has been secured, and a thousand acres set aside for a botanical garden. Every care will be taken to preserve the native flora, as I urged, and additional native specimens will be planted with the object of converting the Canyon into a "real California garden." This should prove to be a most interesting and valuable project. I was greeted at Los Angeles by a telegram from Mr. Hecke and a letter from Mr. Ussher.

Thence I journeyed with Dean Merrill by the night train to Berkeley, and gave three lectures by invitation at the University of California on the three days after my arrival, my days being spent in seeing the various botanical departments of the University and also a very fine collection of Gladioli at the nursery of Mr. Carl Salbach.

Having delivered my lectures, at one of which Mr. A. R. Gould, late of Kew, was present, I was able to devote several days to the interesting regions in the neighbourhood, and was taken to the Sierras and Yosemite Valley by car by Professor H. M. Hall, a journey of some 150 miles. We stayed at various altitudes, and when we were camping at 10,000 ft. our car was raided by a bear during the night who ate all next day's lunch for four people. On the way to the mountains we passed by fields of cotton and millet, prune, walnut, apricot, and peach orchards, vineyards, fields of tomatoes and melons, and many kinds of beans. The country was everywhere very dry, and cultivation in the fields is only possible with irrigation. As we ascended the mountains the dwarf shrubby trees of *Esculus californica*, their leaves already shed and the large fruits hanging on the bare branches, were striking objects among the bare granite rocks. Here also were growing *Ceanothu sthyrsiflorus*, the small-leaved *Quercus Douglasii*, *Arctostaphylos tomentosa*, and many other shrubs. Then came the region of the Pines in zones, starting with *P. Sabiniana*, *P. Jeffreyi*, *P. monticola*, the magnificent Yellow-Pine (*P. ponderosa*), and at higher levels the Sugar-Pine (*P. Lambertiana*), with its huge cones pendent from the ends of the branches.

Dodecatheons, Swertias, Lupins, and Pentstemons were among the common plants in the alpine regions. *Sequoia gigantea* is, of course, the celebrated tree in the Yosemite National Park, but the magnificent Redwoods, *S. sempervirens*, which were visited later at Scotia and Eureka, north of San Francisco, were far more impressive, since they grow in pure stands with trunks up to 300 ft. high. Owing to the deep shade the floor of the Redwood forests is carpeted only with ferns and *Oxalis*, and these vast trees, with their trunks sometimes 15 or even 22 ft. in diameter and 2000-3000 years old, make one realise with somewhat of a shock the insignificance of *Homo* however *sapiens*.

Still, among all these wonders of the natural vegetation, Man, whose destructive hand is everywhere appallingly apparent, has something to his credit, and the splendid Golden Gate Park, San Francisco, which is mainly the work of Mr. Maclaren, is an achievement of which San Franciscans legitimately feel proud.

Mr. Maclaren, who has been in charge since 1887, has converted an area of a little over one thousand acres of blown sand, on the Pacific side of the peninsula, into a magnificent park with spacious lawns of green turf and noble groups of trees and woodland areas. Here Rhododendrons flourish as in Cornwall, and tree-ferns thrive in a sheltered valley.

To a vast city like San Francisco the Golden Gate Park must be of immense value: it is the nearest approach to a botanic garden in the West, though far removed from such an ideal.

A splendid site for a fine botanic garden belonging to Leyland Stanford University, some 40 miles to the south of the city, where I spent an interesting day, is available for a great botanic garden in the West, and it is much to be hoped that the many plant-lovers, in California especially, will seize the magnificent opportunity now open to them and establish a garden commensurate with their great commercial developments and worthy to rank with the notable botanic gardens of the world.

From Berkeley a journey of two nights and a day through the States of Oregon and Washington landed me at Seattle at 6.30 A.M. on a Sunday morning—the two previous nights of the Wednesday and Thursday had been spent in going by train to the Redwood forests and back, while the days had been crowded with long drives by motor-car etc. At Seattle, after a short interval for bath and breakfast, I was taken by friends to Mt. Rainier by car, a distance of 140 miles, and reached Paradise Inn, situated 5557 ft. above sea-level on the slopes of the mountain, at 2.30 P.M., passing some serious forest fires on the way, and then up through forests of Douglas Fir (*Thuja plicata*, *Abies amabilis*, *Pinus contorta*, etc.). A walk and climb over the alpine meadows to a height of about 8000 ft., well above the base of the glaciers, was quite invigorating after four strenuous days, with four nights in the train.

The slopes of Mt. Rainier in early summer must be a wonderful sight. As it was, the crimson patches of *Vaccinium* and masses of golden-yellow *Anemone* leaves in the bright green grass made a lovely picture. *Erythronium* in seed was abundant, while pink and yellow *Mimulus*, *Bryanthus*, *Phyllodoce*, Potentillas, Lupins, Calthas, and Saxifrages were seen in quantity. The Dwarf Mountain-Ash (*Pyrus sambucifolia* ?), with its scarlet berries, was also a beautiful sight. On the lower slopes in the wet, shady places the Skunk Cabbage (*Lysichiton*) was commonly to be seen.

In the Redwood region, I visited a huge Lumber Mill, where such quantities of timber were being cut up daily by machinery into every sort of plank etc. that the needs of America, as it appeared to a novice, could be met for many months, while at Tacoma a lumber factory I was taken over was solely occupied in turning out doors of every sort and kind, made of Thuja wood entirely by machinery, in sufficient quantity, it seemed, to meet the world's demand for a year, especially when I reflected that the Director's house at Kew had probably not had a new door for the last hundred years! Yet this was only one of many such factories in the United States and British Columbia and elsewhere, all engaged in making doors to the number of some 20,000 a week. Where can they all go? Yet, despite this output, I am credibly informed that it is still possible to see a door made by hand

in a carpenter's shop in England! In fact, I have seen the process with my own eyes; and to the eye of the expert and the artist there is a charm and beauty about the hand-made article, be it door or box, which no machine-made article, however well finished, can ever achieve.

Give me to fashion a thing;  
 Give me to shape and mould;  
 I have found out the song I can sing,  
 I am happy, delivered, and bold.

(LAURENCE BINYON: *The Secret.*)

Still, however much we may regret to see the destruction of these forests for the purposes of "Applied Botany or Forestry," yet for these trees to be "converted"—sad misuse of the word—into a machine-made door is a far nobler end than having the degradation of being pulped to supply the demands of the voracious newspaper-reading public, an infamy which may well be styled "Mis-applied Forestry."

To turn to a pleasanter subject: nowhere can the flowers we enjoy in our gardens be seen to greater perfection, I believe, than around Victoria on the Island of Vancouver, or in the gardens around the City of Vancouver on the mainland.

In all the beautiful gardens I visited, annuals and perennials were flourishing with a luxuriance unknown at home, and it was pleasant to see the excellent taste and delight in quiet colour-effects that everywhere abounded. Among natural charms on the island the Dog-wood (*Cornus Nuttallii*), just turning a rich crimson, the magnificent Douglas Fir forests, with their carpet of ferns and Gaultherias, and fine old trees of the Madroña (*Arbutus Menzesii*), with their smooth red stems leaning horizontally over the waterside, were sights which remain fixed in one's memory.

Both at Victoria and at Vancouver lectures were required, and the sight of the Kew Flag pole, the gift of the Government of British Columbia, evoked much interest, and a burst of applause when on the last slide it was seen with the large flag floating at the top.

My holiday time camping out in the Cascade Mountains, and the glory of the scenery and the solitude; as well as my stay in the Rockies, where in mid-September a foot of snow and 22° of frost were encountered, must be passed over, as it is impossible to give a picture of the impressive grandeur of the scenery in a few words. As I saw the mountains, pure white with fresh snow, the lower slopes clad with masses of deep olive-green conical Spruces and here and there patches of Aspen (*Populus tremuloides*), with leaves all golden-yellow, glistening in the sun, I suppose I had a vision of beauty—due to the exceptionally early fall of snow—which few have ever had the good fortune to enjoy.

My way homewards lay through snow, for twenty-four hours from Banff, covering the prairie and stooks of cut corn almost as far as Winnipeg, and eventually Toronto was reached and the University visited. Thence to Niagara across the lake by boat, on which I made

friends with the assistant purser, who proved to be a 4th-year medical student at the University, earning the necessary cash to enable him to resume his studies at the end of the long summer vacation.

Five minutes—dare it be confessed—were all that could be spared for a visit to Niagara Falls, but the magnificent view I had of them at dusk was all that could be desired, and I caught the train to Buffalo for the night journey to Washington, well satisfied.

At Washington I spent two crowded days under the guidance of officials of the United States Department of Agriculture, seeing as much as possible of the internal arrangements of that great organization. Of particular interest was the work of the Bureau, which deals with plant introductions, with regard to which it appears essential that the utmost care must be exercised.

It says much for the vitality of the vegetable organism that it is able to survive the ordeal of the plant introduction regulations, and eventually, bereft of all soil and after being subjected to indignities, to which even the human passenger does not have to submit, to reach the special plant-houses surrounded with coats of oil and screened with gauze, faint and weary, but in many cases still capable of renaissance.

Once in this Holy of Holies, however, and placed in its own gauze cage inside the insect-proof, oil-moated house—a place into which the gardener or visitor may not enter until he has donned, in an outer chamber, rubber boots, overalls, and washed his hands in an antiseptic solution—it is somewhat like Moses of old. Here it is actually in the United States or rather, through the gauze screens, in sight of the United States, its “promised land,” but, as an individual, it will never get there! From the original introduction, cuttings are taken as soon as the poor unfortunate is strong enough to produce shoots, and the parent plant is then destroyed. The cuttings, however, are still suspect of germs they may harbour—or should I say harbor,—so cuttings are again taken from them, and these after due inspection are at length permitted to escape into the New World.

All these precautions sound unnecessary to those of us who are familiar with the ease of introducing new plants to Great Britain; but when it is remembered with what facility noxious fungi and insects can spread in the United States, with their wide range of climate and conditions, and the havoc that has already been wrought by introduced pests, it is realized that in the main the meticulous care exercised by the Department is essential in the best interests of the agricultural and horticultural welfare of the country.

A lecture, I need hardly say, was demanded at Washington, and then I passed on to New York, as usual by night, where three interesting days were spent—one devoted to the New Botanical Garden, another to the Boyce Thompson Institute at Yonkers, where physiological experiments of all kinds are in progress and Mr. J. H. Beale, late of Kew, is in charge of the Arboretum and Gardens, and a

third day at the Brooklyn Botanical Garden, where Professor C. Stuart Gager has developed the educational side of a botanic garden in a very useful and interesting manner, ably assisted by our Old Kewite, Mr. M. Free. At the New York Botanical Garden, I had the honour to give one of the Saturday afternoon lectures, and was introduced to the audience by the Director. Among the large company, it was pleasant to find no fewer than six Kewites present—Messrs. Free, Beale, Downer, Agate, Williams, and Vallance.

Afterwards Dr. Britton most kindly entertained a company of forty-five botanists and horticulturists to dinner, and, somewhat to my embarrassment, I had to respond to very kind and eulogistic speeches about Kew from such veteran masters of the science as Professor Coulter, Dr. Britton, Dr. Rusby, Dr. Harper, Dr. Gager, and Dr. Crocker.

Elated, though not with wine, and crowded with pleasant memories, I left by the night train for Boston, sleeping for the seventeenth time on the journey as one by now to the manner well accustomed.

My two days at Boston were spent to the best advantage, thanks to the kindness of Dr. B. L. Robinson, Director of the Gray Herbarium, Harvard University, and Prof. C. S. Sargent, one day being spent at Harvard and the other at the Arnold Arboretum.

Space compels me to forego an account of the Arnold Arboretum, but the Acts of Professor Sargent and all he has done, are they not written in the chronicles of Kew by the able pen of Mr. Bean (*Kew Bulletin*, 1910, p. 261). Suffice it to say that, under the kind guidance of Prof. Sargent and Mr. Wilson, I was able to see and enjoy to the full the magnificent collection of trees and shrubs, some of which were bearing a profusion of fruit the like of which can never be seen in England. Here I also spent a pleasant time with Mr. Judd, of Kew, in the nursery and propagating department, but unfortunately missed seeing our other Kewite, Mr. Van de Voet, who with Messrs. Wilson and Judd and many others have helped to demonstrate in the United States the importance of Kew in the realms of horticulture and the value of the training they have received.

My tour, like the patience of my readers, is now nearing its end. A final journey by night brought me to Montreal at 8.50 A.M. Fortunately I awoke about 6 o'clock, in time to enjoy the beautiful scenery on the borders of Vermont and the Province of Quebec, and all the glories of the crimson, scarlet, and brilliant yellow of the Maples, Willows, and other trees on the hillsides and in the valleys, resplendent with their autumnal colouring.

McGill University, where I was the guest of an old friend, one of the professors, is, like the University of Toronto, an Institution of which Canada may justly be proud, since in both they have striven, with no small degree of success, to combine all the best features of our old home Universities with the needs of a great and rapidly-developing

new country. Yet another lecture had to be delivered at McGill, a lecture which it was a distinct pleasure to give, since it was owing to my host, who was a science master at Marlborough when I was at school there, that I was encouraged to pursue the paths of Science and abandon the road to the Elysian fields of the Classics, which my attainments would probably never have allowed me to enter.

Both at the Arnold Arboretum and in gardens at Montreal the severity of the winter renders gardening operations a difficult task, and many subjects, introduced by Mr. Wilson, whose beauty we can enjoy at Kew, cannot withstand the conditions of Eastern North America. Where the snowfall, which gives protection, is light, as at Boston, many plants are killed by the intensity of the frost.

From Montreal I travelled home by the Canadian Pacific Railway Company's S.S. 'Melita,' a most pleasant ship, despite the fact, that I had to give a lecture on board; and the journey down the St. Lawrence, with all the glories of the autumnal colouring on either bank, was a sight never to be forgotten. Icebergs in the Straits of Belle Isle and their accompanying chill added one more interesting experience to a journey crowded with pleasant memories, and the sight of the Isle of Wight and Southampton Water on October 14th made me realise with a shock how much I had seen and done since setting out on August 7th.

"See this world before the next" is a slogan of the Canadian Pacific Railway, and I feel that, thanks to that great company and the other railways, over which I travelled some 7000 miles in the United States and Canada, I have been able to accomplish something towards this desired end.

"Not one of all my days can irksome find;  
Not one but I with pleasure call to mind."

ARTHUR W. HILL.

1926.

#### CAMERON'S HIGHLANDS, MALAYA.

A VISIT to one of the small hill stations in Malaya is always of much interest to the botanist; but when he is fortunate enough to be able to undertake a journey into a large area of unexplored mountainous country between 3000 and 7000 feet high, he cannot but feel elated at the thought of helping to "blaze a trail" to "fresh fields and pastures new," situated in a temperate climate yet almost on the equator, and to travel amongst an extraordinarily rich flora containing many new plants and numerous others belonging to the striking Himalayan element that have survived through the ages in these low latitudes. He knows, however, that to reach these Elysian fields his powers of endurance will be severely tested; but any temporary qualms he may experience concerning the hardships likely to be encountered are quickly dispelled, and he looks forward impatiently to the time when he can leave the hot, steamy, and depressing plains with their miles



and miles of valuable though most dull and uninteresting rubber and coconut plantations.

Towards the end of 1922, I was asked to accompany an expedition which had for its object the rediscovery of a large highland area in the backbone of mountains that extends throughout the Peninsula, which had been seen by Mr. William Cameron, a Government Surveyor, in 1885. Cameron, in his report, stated that he had discovered a well-watered central hill-country in the mountains of Pahang, at a mean elevation of 4500-4750 feet above sea-level, where, over a wide area, there were gentle slopes and pamah (plateau) land with rounded hills shut in on all sides by loftier ranges. A part of this district was subsequently passed through by Mr. Leonard Wray in 1887 when collecting plants and animals for the Perak Museum. He reported that he found and followed Cameron's elephant tracks for some distance in the Lubok Tamang Valley below the Highlands and saw the sites of his camps.

It was thought that if the area could be rediscovered and made accessible by road and rail, it would prove an inestimable boon to the inhabitants of the lowlands of Malaya, and also enable cinchona, tea, and other valuable hill-crops to be grown on a commercial scale. After many days of strenuous exertion the expedition reached a tract of country in Pahang with a mean elevation of about 5000 feet and some 40 miles from Tapah, in Perak—our point of departure,—which was considered to be eminently suitable for the purpose indicated, and which apparently Cameron found some 37 years previously.

Beyond dealing with the agricultural possibilities of the Highlands and making a few general notes of the vegetation, I was not able to do more than take cursory note of the many striking plants I saw there; but enough was seen to fill me with an ardent desire to revisit the area at some future time.

It may be mentioned in passing that in 1909 Mr. H. N. Ridley, F.R.S., when Director of Gardens, S.S., collected extensively along a part of the track we followed. He did not, however, enter the area now known as Cameron's Highlands; still, his paper, which was published in the 'Journal of the Federated Malay States Museums' for December 1909 under the title "The Flora of the Telom and Batang Padang Valleys," proved an excellent and most helpful guide to the vegetation of the region.

As a result of my report on the area from an agricultural standpoint, the Government decided to open an experimental station for hill-crops in the Highlands, and allocated a sum of money to the Department of Agriculture for the purpose. In January last, Milsum, another Old Kewite, and I were asked to visit the Highlands in connection with the work of this new station; and, needless to say, I was delighted at the prospect of returning once more to the area and studying its most interesting flora.

In the following account of this visit I propose to describe certain of the interesting features of the area and some of the noteworthy plants which we saw on the journey to and in the Highlands.

Taking the morning train from Kuala Lumpur, we reached Tapah—a town in Perak—100 miles distant, about mid-day, and then packed ourselves, our camping outfit, and supplies for the journey into motor-cars, and set off on a run of 20 miles to the foot of the hills, where the road ends and the mountain-track starts. Arriving here, we found sixty Sakai, men, women and children—the small dark brown, almost black aborigines of the mountains—awaiting us to act as porters. After allotting to each person a suitable load, we set off on foot on our first lap of eight miles to No. 1 Camp at Jor, about 1800 feet above sea-level. This part of the journey was hot and of little interest, and besides there were many annoying leeches on the road. The naked Sakai collected most of these pests, and scraped them off their legs from time to time with their large knives. All, however, reached camp at night with bleeding limbs, to which they promptly applied wood-ashes or tobacco. They did not appear to suffer any ill-effects from the bites. No large wild animals were seen, although on our first expedition one of the party with his Sakai were chased off the track by a large tigress which was guarding a cub.

After the Sakai had been given their rations of rice, salt fish, and tobacco, they wandered off in family groups to the small rough palm-leaf shelters they had built at different points in the jungle near to the camp, lit their fires, and proceeded to cook their food in green bamboo-joints. At night the scene around the camp was most weird and fascinating, for one could catch fleeting glimpses of the little naked jungle-folk when their bodies were lit up by the flickering flames of the fires. All were resting or sleeping in front of the fires, with their feet close to the live embers in order to maintain warmth in their bodies. The fires were not allowed to go out, for, besides providing warmth, they served to scare away any wild animals that might have been prowling around. Next morning we started off for our next camp at Sungei Ringlet, some 10 miles distant, just over the Perak-Pahang divide at an altitude of about 3800 feet. The weather was fine and the track quite good—conditions which were in striking contrast to those of 1922, when we had to cut our way through long stretches of wet jungle and wade in the streams. Soon after leaving Jor we reached an area with large masses of bamboos, including the magnificent giant bamboo (*Dendrocalamus giganteus*, Munro), with its huge culms 8–10 inches thick and often reaching a height of 80 feet. Other old friends were the large blue-flowered climber (*Thunbergia laurifolia*, L.), which appears to be almost always in flower, and the tree Hibiscus (*Hibiscus macrophyllus*, Roxb.), whose large yellow flowers with a maroon centre are very conspicuous. The handsome bicour variety of *Torenia atropurpurea*, Ridl., was also noted. This is a stouter

and taller plant than the type. The lower part of the corolla tube is deep purple with the limb creamy-white.

In this district also we saw fine specimens of the tall Fan-Palm (*Livistona cochinchinensis*, Mart.) and the dark-leaved *Arenga Westenhouti*, Griff. The former makes a good pot plant, so that opportunity was taken to collect seed and seedlings of it to take back with us. In one place we saw a group of tall trees with their trunks almost covered to a height of 30-40 feet with what appeared to be the strong-growing *Vanilla montana*, Ridl. The plants were flowering freely, but no fruit was seen. A striking tree, with its masses of crimson flowers, was the Immortelle (*Erythrina lithosperma*, Miq.). Ridley thought that this species was undoubtedly wild here. Even if it is not indigenous, it appears to be quite at home and holding its own in the mountain-forest. Arriving at the top of the pass, which is 4300 feet above sea-level, and through which the boundary line between the States of Pahang and Perak passes, we paused to survey a glorious panorama of the mountains and valleys of Pahang, all closely covered with unexplored virgin jungle. In the far distance we could see Gunong Berembun, up the slopes of which mountain we had to climb before we could reach the Promised Land beyond. Unfortunately, we were unable to stay here long to admire the view, for we were immediately beset by large numbers of particularly tame honey and dammar bees, seeking the salt in the perspiration streaming from us. They clung so tenaciously to any exposed portion of our bodies that the only thing to do was to move off quickly. Just below this pass there is an almost perpendicular and very slippery descent of perhaps 200 feet, used by the Sakai and known to us as the "butter slide." The brave take their chances on the slide, whilst the timid take the long walk round. We chose to test the slide, and after performing many ape-like movements, and spoiling the appearance of our clothes, we rejoined the track and soon found ourselves amongst vegetation which differed considerably in many respects from that through which we had just passed on the other side of the ridge. We had not proceeded far before we came to a small bog, several yards square, filled with the beautiful *Impatiens oncidoides*, Ridl. The plants were in full flower, and their large bright lemon-yellow flowers made a most delightful picture in the sunlight. Our only regret was that no photograph of them could be made with any chance of success. Milsum promptly collected a supply of seed to send to Kew, where we hope that success has been attained in raising plants. After such a pleasing experience, much of the weariness of the flesh vanished; still, we did not seek further treasures that day, and soon reached our second camp at Sungei Ringlet, after a short descent of 400 feet from the divide. Breaking camp early next day we set off for Tanah Rata, about 9 miles distant, at the southern end of Cameron's Highlands. The track was good and fairly level for some distance. The soil of this district is for

the most part a sandy loam derived from altered sedimentary rocks and granite. We saw many fine specimens of the conifers, *Dacrydium elatum*, Wall., and *Podocarpus imbricatus*, Bl.—one tree of the latter measuring 10 feet in circumference at 3 feet from the ground. Some seedlings of it were carefully collected, for, strange to say, several of the interesting local species of conifers found in the mountains thrive well under cultivation in the plains. Epiphytic orchids were abundant; among the striking ones seen were *Bulbophyllum maximum*, Ridl., with its large leaves and fine flowers massed together on a long peduncle, each flower being from 4–6 inches long and of a pretty light green colour with a violet centre; *B. polystictum*, Ridl., a rare plant with solitary large flowers, shaded and quaintly marked in green, yellow, pink, red, and black: and *Ceologyne Dayana* (fig. 1), a well-known species; whilst terrestrial ones were represented by a species of *Acanthophippium* (probably new), with large leaves and short racemes of yellowish flowers, and *Tainia Maingayi*, Hook., whose deep purple flowers were quite conspicuous.

Numerous ferns covered the banks along the track; these, together with the pretty little *Sonerilla picta*, Korth., with its rose-pink flowers and glistening foliage, were most pleasing. In other places there were lovely groups of tree-ferns (*Alsophila* spp.) (fig. 2), and the large banana (*Musa truncata*, Ridl.), with its distinct dark brown-purple pseudostems and purple-violet bracts. When nearing the River Bertam, which flows along a long narrow valley named Lubok Tamang, we passed through Sakai clearings, where we found, besides food-plants such as tapioca, sweet potato, yam, maize, millet, Jacob's Tears, gourds, and pumpkins, such interesting plants as the edible wild raspberries (*Rubus rosaeifolius*, Sm. and *R. glomeratus*, Bl.), the sanicle (*Sanicula europaea*, L.), and the Pennywort (*Hydrocotyle javanica*, Thunb.). On reaching the fine mountain-stream named the Bertam, one of the first plants to catch the eye along its banks was the violet (*Viola serpens*, Wall.), growing in large spreading clumps and flowering very freely. The flowers are faintly fragrant, pale lavender streaked with violet-purple. The occurrence here of this species is noteworthy, because to date it has not been recorded from any other part of the Peninsula except Penang Hill, where it is now extinct. Here, again, is to be found the newly-discovered honeysuckle (*Lonicera malayana*, Hend.), also peculiar to this locality. Perhaps one of the most striking epiphytes which we saw on a tree overhanging the river was *Medinilla venusta*, King, with its cymes of large pure white flowers. A pretty little legume with orange-scarlet flowers, namely *Desmodium Scalpe*, DC., was very abundant, and is yet another plant which has not been found elsewhere locally. Labiate plants were not plentiful, but the salvia-like blue-flowered *Scutellaria discolor*, Colebr., was fairly common. A rare species of considerable merit that we had not seen before was *Disporum pullum*, Salis., var. *multiflorum*. This Liliaceous plant, which bears

umbels of greenish-red flowers followed by dark blue berries, stood out quite prominently along the track.

We were much struck with the charming Gesnerad (*Didissandra filicina*, Ridl.), which was very common on shady banks. Besides possessing attractive purple flowers, its leaves are fern-like and quite decorative. If not already in cultivation it should certainly be introduced.

On reaching the end of this interesting valley at the foot of Gunung Berembun, we started on the ascent of about 1000 feet to the Highlands, following closely the River Bertam, which descends from the Highlands in a fine series of cascades, which were discovered on our first expedition and are now known as the Robinson Falls. The falls have a drop of about 850 feet in less than a mile, and it is thought that, when harnessed, they will be capable of supplying all the light and power required for the hill-station when it is formed. During the climb we obtained fine views of the falls and also of the mountains and valleys we had left behind.

After a short walk from the head of the falls through flat woodland country, where we saw along the streams masses of the yellow balsam, violet, *Scutellaria*, and in the open the little creeping *Pratia begoniifolia*, L., with its rounded leaves and decorative purple berries, we reached Tanah Rata Camp, at an elevation of 4625 feet. As soon as they had deposited their loads, several of the Sakai disappeared into the jungle with their blow-pipes in search of monkeys, birds, and other small game, and to set rotan snares for squirrels and rats, which animals are greedily eaten. For procuring game these Negritos rely to a considerable extent on the bamboo blow-pipe and poisoned darts. The effectiveness of the small darts used is due, as is well known, to the dried sap of the indigenous Upas-, or Ipoh-tree (*Antiaris toxicaria*, Bl.), with which their "business" ends are smeared, and which has a powerful paralyzing effect on the muscles and nerves of the animals pierced by them.

Immediately behind the camp is a hill 500 feet high, named Rhododendron Hill. This we climbed the following morning. The path led us underneath medium-sized straight-stemmed trees, with very little undergrowth. We noted two small trees with long-stemmed creamy white and very fragrant flowers, whose strong fragrance resembled that of the Chempaka (*Michelia Champaca*, L.); these proved to be *Magnolia Maingayi*, King and *Polyalthia pulchra*, King, both far from common species.

Near the summit we reached a mossy zone with small stunted Myrtaceous species, and other trees and shrubs with small leathery leaves. The stems and branches of all the trees as well as the soil were thickly covered with mosses, filmy ferns, and liverworts. These mossy forest zones occur throughout the Peninsula on high mountain peaks and ridges. Many of the mossy dells and bowers through which

we passed both here and in other places during our stay in the Highlands were most interesting and beautiful. In mossy banks the fine Pitcher-plant, *Nepenthes Macfarlanei*, Hemsl. (see photograph, fig. 3) was common. The pitchers, which are dark green, often spotted with red or deep red and very variable in size, were mostly embedded in the moss with just their rims and lids showing above the surface. The traps are so cunningly set that they catch large numbers of small crawling insects.

The ecology of the mossy zones has not been thoroughly worked out. They occur in places where there is much cloud and mist, the rainfall is heavy, and the overhead growth of stunted shrubs and trees is thin. Edaphic or soil-factors may also have a good deal of influence on their formation. As a meteorological station has been formed on the top of this hill, where a comprehensive daily series of observations is being made, this should in time supply most valuable information concerning the climatic conditions which lead to the creation of mossy gardens at high elevations locally.

On the summit of the hill we noted large masses of the *Rhododendron Wrayi*, King, with its large umbels of white flowers tinged and spotted with red. We also found the pretty little red-flowered epiphytic rhododendrons, *R. javanicum*, Benn. and *R. malayanum*, Jack. Suspended from *Gleichenia* ferns and shrubs were the beautiful large white or white tinged with red pitchers of a *Nepenthes* species which was possibly a form of *N. Macfarlanei*. Some of the pitchers we measured were over 8 inches long.

It may be of interest to note in connection with the growth of these plants that the mean maximum daily temperature here is 70° F. and the mean minimum 58° F. The highest temperature so far recorded is 78° F. and the lowest 53° F. The rainfall for 1924, which was above the average, totalled 138.79 inches, and rain was recorded on 264 days. Frost has not been observed on the Highlands, but on two nights during our stay at Tanah Rata, below Rhododendron Hill, the temperatures on the grass were as low as 40° F. and 41° F. respectively.

The commonest Myrtaceous tree on the hill-top was *Baeckea frutescens*, L.; this resembles a juniper, and grows well under cultivation at low elevations, where it makes quite a decorative tree.

A trip to the top of Gunong Berembun, 6065 feet, at the southeastern end of the Highlands, was next undertaken. Starting from camp, the ascent is gradual for about one mile until the water-parting is reached. The soil underneath the medium-sized trees and low-growing *Calamus*, *Pinanga* and *Areca* palms is often soft and boggy, and in these places are to be found the two terrestrial orchids, *Calanthe angustifolia*, Lindl., and its fine yellow-flowered variety *flava*. On a previous visit in September 1922, I collected several plants of it, but on this occasion we only saw the white species. Ridley thought that the yellow variety might possibly be a hybrid with *C. albo-lutea*. Just off the track and near to the banks of a small stream there was in flower a

large *Amorphophallus*, which agreed fairly well, except in size, with Ridley's description of *A. bufo*. It was without leaves. The peduncle was no less than 4' 6" long, mottled and blotched light and dark grey on a creamy background. The spathe-tube was 5" long and 6" wide at the mouth, whilst the limb, which was almost erect, was 9" long and 9½" wide, mottled and blotched like the peduncle. It was a very striking object. Other aroids of note were two or three species of *Arisæma*, with their curiously-marked and long-tailed spadices. In this area we also found three good begonias, two with decorative leaves; these were *Begonia pavonica*, Ridl. and an old friend *B. decora*, Stapf, and *B. venusta*, King, with large white flowers tinged with pink.

Both here and in the Lubok Tamang district we saw in flower several plants of the well-known epiphytic orchid, *Cælogyne speciosa*, L.

The last section, about 500 feet, of the track proved hard to climb; still, there was much to interest us. We had hoped to find again the large tree, *Rhododendron Klossii*, Ridl., of which only one tree is known at the present time. We were successful, for Milsum picked up several large white flowers of rather papery texture which appeared to belong to the species, and found the tree from whence they had fallen. We were delighted to see the pretty little yellow-flowered *Rhododendron Robinsonii*, Ridl., and two beautiful species of *Æschynanthus* with brilliant red flowers which were without doubt *A. perakensis*, Ridl., and *A. longicalyx*, Ridl. Near the summit we passed through a mossy zone and also masses of the slender little bamboo, *Bambusa elegans*, Ridl. This graceful bamboo has stems several feet long, still not thicker than a pencil. It is much sought after by Malays who are out of luck in their love affairs, but in what way it is used to charm their fair ladies I cannot say.

On the summit of the mountain we obtained a glorious view of highlands and lowlands in three states, namely Perak, Pahang, and Kelantan. Around us among the dwarf-trees, shrubs, and ferns we noted large clumps of the multi-coloured terrestrial orchid, *Dilochia Cantleyi*, Ridl., the yellow *Didymocarpus sulphurea*, Ridl., and the distinct grass, *Isachne javana*, Nees.

Our next trip was to a rather remarkable bog, about ½-mile long and less than ¼-mile wide, situated in the centre of the Highlands in a low-lying level area. Although well sheltered by high hills from wind and driving mist, it has an association of plants resembling in many respects those on the mountain-tops previously described, so that here, at any rate, soil-factors appear to be mainly responsible for the formation. The soil consists of a spongy peat, nearly always wet owing to the water which drains into it from the surrounding hills. But, strange to relate, it carries a wealth of interesting plants. The chief tree is *Bæckea frutescens*; but other small, stunted Myrtaceous ones occur. The trees give very little shade, and are often festooned with the long dark green or brown pitchers of *Nepenthes gracillima*, Ridl.

var. *major*. Quite at home also was the lovely little *Rhododendron jasminiflorum*, Hook., which is so well known in Europe. It is a straggling plant, having its roots in the peat. A charming ginger-lily (*Hedychium* sp.) which bears numerous large white flowers on a terminal spike was common. This is a species not yet described. Here again we found the orchid, *Dilochia Cantleyi*, Ridl., and other old friends. In taking a photograph of the plants we were, as usual, besieged with small bees seeking salt, and also by a small blood-sucking fly known as "Agas Gajah," or the elephant-fly. This little pest is only found in damp places. It resembles a miniature house-fly, and its bite often becomes septic if not treated promptly with a strong antiseptic. Although amidst most pleasing surroundings, there was, as usual, the proverbial "fly in the ointment," and the photograph was not as good as we had hoped it would be.

From the camp at the northern end of the Highlands we ascended the highest mountain, Batu Brinchang (6665 feet). The flora was similar in many respects to that on Berembun. Here we found two plants that we had not noticed elsewhere—namely, the dainty epiphyte, *Rhododendron calocodon*, Ridl., with its small deep-red flowers, and the pretty little orchid, *Sarcopodium longipes*, Kranzl., with white rose-tinted sepals and petals.

Although not of horticultural interest, mention should be made of those curious parasitic flowering plants which we frequently saw under the trees here and in other parts of the Highlands—namely, species of *Balanophora*. These parasites, which are capable of destroying large trees and vines, attach themselves to the roots of these and produce large, warty, tuberous rhizomes which are brilliantly coloured orange or scarlet.

From Batu Brinchang we saw in the distance the top of a hill with a white outcrop of rock which we thought might be limestone. If this proved to be the case, the rock would be valuable for building and agricultural purposes when converted into lime. We decided to endeavour to find our way to it next day and make an investigation. As the hill was far removed from any track, we had to cut our way through the jungle almost step by step or wade up the swift-flowing streams. We had a morning's experience of the difficulties encountered on my first visit of exploration. The chief plant of the undergrowth was a rattan-palm, or "Scotch lawyer"—a species of *Calamus* whose leaves are spiny, with their midribs extended in the form of long whips closely set with short, sharp, recurved hooks which tore our clothes and seared our flesh; however, we were rewarded on reaching the almost bare summit of the hill by a wonderful view of the Highlands. Unfortunately, the white rock proved to be quartz and not limestone. The plants here were similar to those we had seen on other peaks, except that we found the interesting ferns, *Dipteris Horsfieldii*, Br. and *Polypodium triangulare*, Scort., the latter a pretty little plant growing in rock-crevices. A bushy form of *Baccharis frutescens* was also common.



It may be mentioned that the soil of the low-lying and more level areas of the Highlands is for the greater part a sandy loam derived from granite and quartz. On exposed peaks and ridges it is often thin and rocky, or boggy and peaty.

On returning to Tanah Rata we had the distinction of planting out the first cinchona and tea seedlings on the Highlands, where they should thrive and provide seed for large plantations in course of time.

We left the Highlands feeling confident that, had we stayed longer, we should have found many more new and rare plants; still, our visit was a most pleasant one, and we were amply rewarded by seeing in their natural habitats so many charming and interesting plants, a few only of which are briefly described in this article.

W. N. SANDS, Dec. 1926.

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#### APPLICATIONS OF PLANT-ECOLOGY.

By W. B. TURRILL, M.Sc., F.L.S.

As a scientist I always deprecate the idea that scientific work should have an immediate practical aim measurable in terms of *£ s. d.* Nevertheless, a scientist is usually gratified when scientific results are applied successfully to economic problems; and it is certain that the world would be a healthier, wealthier, wiser, and, presumably, happier place if scientific methods were used on a larger and wider scale than they are. This is an introduction of wide import, but the subject I wish to outline is itself of almost unlimited possibilities. Ecology is, in its modern form, of very recent development as a separate aspect of botany (or rather of biology). Plant-ecology is concerned with the relationships existing between plants and their surroundings (their environment) and the grouping of plants into kinds of vegetation. It follows that any practice concerned with living plants must have an ecological side, whether this be recognized or not. It will then form a convenient classification for my remarks if we take, turn by turn, the more important of the practices, involving plant-life, which are indispensable to the conditions established by Man as civilization. These will be horticulture, agriculture, and forestry. Finally, reference will be made to some minor applications of ecology to human problems.

*Horticulture.*—The 'New English Dictionary' defines horticulture as "The cultivation of a garden; the art or science of cultivating or managing gardens, including the growing of flowers, fruits, and vegetables." There is no need for me to emphasize that horticulture is both art and science. Perhaps the artistic side is most marked in landscape gardening; yet even here ecological studies are often relevant. The natural grouping of vegetation is a basic part of synecology, and a

landscape gardener should be able to recognize the various types of vegetation which occur in nature, and should know something of the detailed structure and physiology of any plant communities which he desires to reproduce artificially. Natural grouping is a characteristic of much modern gardening, and for avoiding incongruities which might spoil the general harmony of the result, there is no better method than an appeal to nature. From the scientific standpoint gardening is as much applied ecology as is agriculture. This is so true that it is only possible in the space available to pick out a limited number of examples. Most of what is said about the soil under the heading of agriculture applies equally to horticulture, or at least does so with slight modifications. For the rest we will take a number of the more important subdivisions of the gardener's craft, and illustrate the aid which can be given by ecology.

*Rock Gardens.*—The popularity of these seem established, and even the botanist is grateful that this is so, for there is no phase of gardening which has so many botanical possibilities as rock-gardening. More species can be grown in a rock garden than in any other equal-sized area. It follows that the natural environments of suitable species are very varied, and their study is essential to quick success in growing them. Moreover, the very making of a rock garden requires ecological knowledge. In England, at least, a rock garden should be open to the warm sunshine and sheltered from cold, drying winds. High-mountain plants, which are a characteristic feature of most rock gardens, in their native habitats are protected during the unfavourable season by a continuous snow covering. This important protection is usually absent here. Moreover, our frequently wet autumn and winter will cause the plants to rot if the drainage is not well arranged. In mountainous districts the drainage is frequently almost perfect, yet the rocky nature of the soil helps to prevent complete drying out, and the long-rooted "alpines" can tap a water-supply which, with the xeromorphic structure of many of them, is sufficient. Numbers of such high-mountain plants do not flourish in ordinary garden soil. A rocky soil with stones beneath which the moisture is conserved is more natural to them. Some species are very definitely lime-lovers (calcicoles), others are lime-haters (calcifuges). An acid, neutral, or alkaline soil is frequently a dominating factor in nature and in the garden. Yet, again, the degree of sunlight and the degree of shade which a plant can stand varies enormously with the species. Many high-mountain rock plants are naturally subjected to most intense insolation, and refuse to flourish in the shade or half-shade where many ferns, *Ramondia* spp., *Primula* spp., *Haberlea rhodopensis*, and others must be grown. Plants requiring much sun and a relatively dry substratum are species of *Onosma*, *Androsace*, *Sedum*, *Saxifraga*, *Campanula*, and *Veronica*.

*Ericaceous Shrubberies.*—The cultivation of members of the *Ericaceae*

has become an important feature of British gardening. Recent investigations have shown that all the species have in nature mycorrhiza—*i. e.*, an association of the ultimate root branches and a fungus partner. The full physiological significance of mycorrhiza cannot yet be considered as established, but they usually occur as part of a superficial root-system distributed in the top layer of the soil which is composed of decaying organic matter provided by the fallen leaves etc. It follows that a leaf mulch or its equivalent is essential for the successful growing of *Rhododendrons* and other ericaceous shrubs—a practical ecological fact.

*Seaside Gardens.*—While a considerable amount of ecological research has been devoted to the edaphic conditions obtaining around our coasts, few scientifically-established facts regarding the influence of the atmospheric peculiarities on plant-life are available. The application of ecological facts to the planting of new terrain on our coasts and the effects of a vegetable covering on retarding erosion are dealt with below. Here it must suffice to say that gardening experience, rather than ecological research, has, up to the present, been the means by which the success of seaside gardening has been attained. Certain species, not necessarily halophytes, have been found capable of withstanding the stormy blasts and the damp salt-laden air of the coast. Lists of trees, shrubs, and herbaceous plants suitable for seaside gardens will be found in such works as A. D. Webster, 'Seaside Planting,' T. Fisher Unwin, Ltd. (1918). There is, without doubt, a big field of applied ecological research for anyone employed in gardens by the sea.

*Water Gardens.*—Aquatic vegetation is best developed, in Europe at least, in the lowlands, where the water is alkaline or neutral in reaction, where it contains abundance of nutrient salts in solution, and where it is still or only in slow movement. For successful water gardening these facts must be remembered. A constant feature of aquatic habitats in nature is the zonation of vegetation. In the centre of a natural area of water occur submerged aquatics; then frequently plants with floating leaves, as the water-lilies and water buttercups; next a belt or zone of plants rooted in the mud, but with leaves and inflorescences projecting above the level of the water; and finally one finds a zone of marsh plants forming a transition to terrestrial vegetation. It is essential to remember the salient features of zonation in forming and stocking a water garden.

*Bog Gardens.*—The ecological conditions of bogs are known to be peculiar, and often, especially in this country, the flora and vegetation of bogs is relatively poor. Few species that are not naturally bog plants can survive the peat and *Sphagnum* substratum. However, various species of insectivorous plants, which frequently inhabit bogs, such as *Drosera rotundifolia* and other species, *Pinguicula* spp., and the pitcher-plants of the genus *Sarracenia*, enable a bog garden to be made both beautiful and interesting.

*Lawns.*—The ecology of grasslands with reference to their agricultural usage has received some attention in different countries; but research work on lawns has been, so far as I know, almost entirely by horticulturists with an immediate practical aim. During the dry summer of 1921, I made a short investigation of the effects of the drought on the Kew lawns\*; and this was sufficient to indicate that an interesting field of applied ecology remains almost untouched, apart from the work done by the big seed-firms.

Space will not permit detailed accounts of the close relationship between ecological methods and results and many other aspects of the gardening craft, but as intermediate between horticulture and agriculture something must be said regarding fruit-growing.

*Fruit-growing.*—I know of no better example of the application of ecological research *methods* to a specific problem of “applied botany” than the investigation carried out at the Woburn Experimental Fruit Farm on the influence of grass on trees and the resultant extension to the toxic action of one crop on another †. Following a long series of observations and experiments, it was shown that grass under fruit-trees has a very deleterious effect on their growth, crop-weight, leaf-size, total weight of foliage, length and vigour of the new wood formed, increase in weight of the stems, and development of the roots. The effects on colour and appearance, of various parts of the trees, were also very noticeable, although not measurable in numerical terms. The possible causes were then investigated, and it was shown that no explanation was afforded by modifications of soil aeration, soil temperature, bacterial conditions, alkalinity, physical condition of the soil, or nutrient material of the soil. Finally, the conclusion was reached that the effect of grass on trees must be due to toxic action. Extended experiments showed that this was but one special instance of the general effect of one crop on another. The following plants were found to be susceptible to the baleful influence of a surface crop: mustard, tobacco, tomatoes, barley, clover, two grasses, Brussels sprouts, pears, plums, cherries, apples, beech, oak, ash, larch, spruce, and firs; whilst those found capable of affecting other plants were mustard, tobacco, tomatoes, clover, apple-trees, and sixteen grasses. No negative results were obtained, though, of course, exceptions may exist, and very great variations were observed in the extent of the effect. It must be emphasized that such toxic matter as may be formed in the soil as a result of plant-growth has only a very temporary existence, and does not accumulate in the soil at all. It is only while the surface is actually growing that trees are affected by it. The chemical nature of the toxin and its method of formation are as yet unknown. It does not follow from the experiments that it is secreted by the roots.

\* See *Kew Bulletin*, 1922, p. 10.

† Duke of Bedford and S. Pickering, ‘Science and Fruit-growing,’ Macmillan & Co., 1919.

Plants contribute much organic matter to soil in the course of their normal growth, and the decay of this is known, sometimes at least, to produce substances deleterious to plant-growth. There is probably some connection between the presence of toxin and the early stages of decay of the dead roots etc. The full significance of these researches has still to be reached, and their application to ecological and economic problems may have important results.

Another line of applied ecological work with fruit-trees as the main subject has been the detailed study of root-systems. Weaver, in America, has specialized on the study of root-systems of both wild and cultivated plants, especially cereals and forage plants; but in this country the most important work has been done at Long Ashton, with special reference to fruit-trees as stocks. The investigation has shown that a wide range of root-systems occur even in one genus, and that this has a most important bearing on the relative economic value of the varieties.

*Agriculture.*—The 'New English Dictionary' defines agriculture as "the science and art of cultivating the soil; including the allied pursuits of gathering in the crops and rearing livestock; tillage husbandry, farming (in the widest sense)." Apart from the purely business side, agriculture, as here defined, is almost entirely applied ecology, and in the original narrower meaning of "cultivating the soil" it is applied plant-ecology. Without doubt, then, the purely scientific side of plant-ecology may be often of great help to the farmer, and, conversely, the farmer can often indicate ecological problems and even their solution to the plant-ecologist. A whole series of essays could be written under the title "Ecological Aspects of Agriculture," but it must suffice here for us to consider only a limited number\*.

All the species of plants commonly grown as crops have a root-system in the soil, whence they obtain water and mineral food in the form of dilute solutions of salts. It follows that the chemical, physical, and biological constitution of the soil has a very direct connection with the production of maximum crops. On the other hand, it is known that the soil (edaphic) conditions are locally of the greatest importance in segregating different kinds of flora and vegetation. Hence the ecologist and the agriculturist have to study the soil, and the results obtained by the one are often of the greatest interest and value to the other. There are many well-known books published on the soil with special reference to plant-life, and a periodical, *Soil Science*, is entirely devoted to pedology, as the study of the soil is termed. It may be mentioned in passing that modern work has led to the conclusion that the microscopic fauna and flora of the soil is of the greatest importance to higher plants, both in preparing their raw food and in more complex

\* Reference may be made to two works published by the Ministry of Agriculture and Fisheries: 'Agricultural Research and the Farmer' and 'Research and the Land.'

and less clearly understood symbiotic relationships. The enrichment of the soil by means of manures and fertilizers is usual in agriculture in this country. One of the most interesting experiments of applied ecological nature I have seen is that which has been carried on at Rothamsted for 70 years. A uniform natural grass-field of about 7 acres was divided into plots, and each plot was given different manurial treatment. With certain exceptions, the same manuring has been applied to each plot up to the present day. The crops from each plot have been carefully weighed and botanically analyzed each year, but ecologically the most striking feature of the experiment is the great difference now visible in the botanical constitution of the various plots. No two of the original plots are exactly alike, and the differences in the species present and in their relative abundance are very great. For a full account the reader should consult Dr. Brenchley's book, 'Manuring of Grassland for Hay,' and the references given there. The rotation of crops, both in horticulture and agriculture, and its relationship to the substratum is a subject with many ecological bearings, especially being capable of correlation with some of the phenomena of plant-succession. Mention may also be made of the use of plants as indicating the nature of the environmental conditions and especially of the soil. F. E. Clements\* has studied this subject in America, and its application is obvious in pioneer agricultural development in new regions. A survey of the natural vegetation of a given area should enable an experienced ecologist to say what crops would and what would not flourish, and even to indicate what agricultural methods and processes would most likely be successful.

The ecology of grasslands is of the utmost importance in countries where pasturage has to be found for flocks and herds of domestic animals. Research on pasture plants in this country has been chiefly concerned with the relative value of the numerous varieties of the common grasses and leguminous species and with the effects of manuring. In many countries, especially where climatic conditions are less favourable to grassland than they are here, other problems occur. Mention may be made of the researches of Cockayne on the tussock-grass formation of New Zealand, where, in some districts, over-grazing has ruined pastures. The ecological effects of burning grasslands have still to be studied in detail. In many countries, for example in the Balkan Peninsula and on the veldt of South Africa, fire is deliberately started to burn the dry herbs or shrubs with a view to increasing the value of the pasture. Burning of the grouse moors in Scotland is a regular practice. There is here an excellent subject for research which might result in considerable modifications of current methods.

\* See 'Plant Indicators' (1920) and 'The Phytometer Method in Ecology' (1924), both published by the Carnegie Institute.

The ecology of weeds is of wide interest. It has been proved that the weed flora varies with climatic, edaphic, and cultural conditions, and the detailed study of the life-histories of individual species (autecology) has indicated means of ridding land of undesirable weeds. Much, however, remains to be done, and here again is a very fine applied ecological subject for research. The best work up to the present is summarized in 'Weeds of Farm Land' by Dr. Brenchley (1920).

*Forestry.*—Forestry, as the term is used here, is defined in the 'New English Dictionary' as "the science and art of forming and cultivating forests, management of growing timber." So far as the science of forestry is concerned, it is practically applied ecology. A chief aim of the forester, as distinct from the forest protector or exploiter, is to produce the most valuable timber from the trees best suited to the local climatic, edaphic, and biologic conditions. Having determined the economic value of the timber produced from different species, the next step is to investigate the reactions of the trees to their environment, so that this can be modified as far as possible to produce the best economic results. The following ecological subjects, amongst others, are of the utmost importance to the forester:—The climatic and soil (edaphic) conditions and their influence on each species; the degree of shading and crowding which produce the required amount, rate, and kind of growth; the root-system and its relationship to and modification by the different types of substrata; natural regeneration; the influence on one another of species growing together; the effects of insect and plant pests and of man's activities, including the grazing and browsing of domestic animals.

Emphasis may also be laid on the fact that forestry itself modifies the ecology of the surrounding districts for other organisms, and, above all, for human societies. The influence of forests on the temperature of the air and soil, upon rainfall, upon the melting of snow, on water-supply, on floods, on soil erosion, and on human health has been fully considered by Prof. A. Henry in his book, 'Forests, Woods, and Trees in Relation to Hygiene' (Constable & Co., 1919). Further, we may note the advantages (as wind-screens etc.) and disadvantages (as harbouring pests etc.) of forests relative to agriculture and horticulture in districts near them.

It has often been stated that a farmer is naturally conservative because it is necessary for him to plan one or more seasons ahead, and the return on his invested capital is not immediate. This is true to a greater degree of forestry than of agriculture. Trees form slow-growing crops, and very large losses may result from mistakes in the initial work. Here co-operation between the ecologist and the forester is likely to be most valuable to the latter. An ecologist, experienced in the local vegetation, can tell at a glance, from the composition of the existing flora, what trees will flourish and what will not under the existing environmental conditions. To the ecologist plant-species

and vegetation communities indicate, even measure, the physical and biologic factors of a habitat. Consequently, the natural flora and vegetation is a sure guide to the climatic, edaphic, and biologic conditions of a given habitat, and to the best means of utilizing it for timber production.

It is especially in the association of different species of trees that preliminary ecological studies are likely to be of use to the forester. Thus the relative value of pure and mixed woods varies with environmental (as well as economic) factors. It is applied ecology to find by observation and experiment which species grow best together under given conditions. Simple rules apply to only small areas because of the number of independently varying external factors. Pure ecological research is increasing our knowledge of species which grow together naturally under given conditions, and is also indicating what species should not be planted together. In the Tropics the problems of ecology and forestry are very different from what they are in temperate regions, but it seems very probable that a linkage of the two is even more important in the former than in the latter. Where forestry is highly developed, nature is harnessed, but in newly opened-up countries she is usually just exploited. If this is done judiciously, with due regard to the future, it is well from the human standpoint; but so often exploitation has been synonymous with destruction, especially of the valuable forests. I have studied so many painful examples of this in the Balkan Peninsula that I feel it cannot be made too plain to all who have charge of developmental schemes in any country. It follows that a careful study of natural succession, regeneration, dispersal, invasion, ecesis, and the other phenomena of synecology should be made before exploitation is commenced in order to avoid "killing the goose that lays the golden egg."

One aspect of applied ecology of considerable importance in this country cannot be classified under any one of the above headings. I refer to the fixing of unstable ground by means of vegetation. It is well known that railway embankments and other artificially formed slopes are made much safer by their being covered with a continuous closed vegetation of perennial plants. The best examples are, however, to be found around the coast, and the fixing of sand-dunes, mud-flats, and shingle beaches by the planting of herbs with peculiarities of underground system, growth-form, multiplication, etc., has become a regular means of restricting the destructive effects of instability and even of reclaiming new and valuable agricultural land. It will suffice here to mention the fixing of sand-dunes by means of marram-grass (*Psamma arenaria*), of mud-flats by the so-called rice-grass (*Spartina townsendii*), and of shingle beaches by *Suaeda fruticosa* and *Tamarix*. Those who wish to obtain full information on the subject should refer to 'Tidal Lands, a Study of Shore Problems,' by A. E. Carey and F. W. Oliver (Blackie & Son, 1918).



Enough has surely been said to prove my thesis that ecology has very wide applications in those practices of modern life involving the utilization or cultivation of plants. It only remains to urge my readers to obtain a sufficient knowledge of ecological methods and results, to be able to use them to advantage in any branch of horticulture, agriculture, or forestry in which they may be engaged. For this purpose they cannot do better than obtain, read, and digest the book issued last year by the British Empire Vegetation Committee, and reviewed elsewhere in this number of the *Journal of the Kew Guild*.

#### EXPERIENCES OF AN OLD KEWITE AS A RAILWAY GUARD IN LONDON DURING THE GENERAL STRIKE.

KEWITES who have led an active life in the Tropics and have reached retiring age, as laid down by Government regulations, often yearn for something to do rather than "go on the shelf." For these a General Strike, such as was experienced in Great Britain during the early part of May 1926, affords an unusual opportunity.

At the commencement of the Strike, the writer, after some amusing and rather exciting preliminaries, was accepted as a railway guard on the Underground Railway. My first day's experiences included the smashing of a motor-bus in which I was travelling, but incidents such as these were soon forgotten. During the first day or two of the strike the wonderful underground railway systems of London, the most remarkable organisation of its kind in the world, resembled those of a dead city. The "volunteer recruits," however, soon became busily occupied in acquainting themselves with the working methods of the line, the necessary precautions that were to be taken should occasion arise, together with the preliminaries necessary in such a venture. In making a selection of volunteers for the work, an effort was made at certain discrimination, not on account of rank or social status, but rather of efficiency or aptitude. A few questions were addressed individually to volunteers with regard to their experience of railway duties, if any, and which branch they considered themselves most suited for, and so on.

In the same room where the process of selection went on were persons with names well known in society or in the professions, and, of course, there was a good sprinkling of "Knuts," "Plus-fours," and even "Monocles." The writer had as fellow-workers on the same train an Indian Army colonel, a major, and a man well known in the aviation world. Station staffs were composed largely of undergraduates from Cambridge and Oxford (who "wouldn't have missed it for the world"), medical students, and theatrical artistes (for the theatres were mostly closed and the hospitals had to look after themselves as best they could); and these, during the slack hours especially, had sometimes

made the situation a regular pantomime. At one station the staff of porters, ticket-collectors, etc., included some half-a-dozen noblemen, a real "Earls' Court," so to speak.

The writer having satisfied his questioners that he could, with a little practice, see that the passengers were safely aboard the train shout the names of the stations the train was to stop at (with luck), slam the doors, blow a whistle, and wave a green flag, he was duly passed for a job as a guard. A few more "recruits," as we called ourselves, having been similarly passed, we started off with the first train on practice runs with an official of the Company in charge. And great was the excitement as we entered and left each station as if "to the manner born." It did not take us long to become *au fait* with the intricacies of the work, the signals, automatic points, "dead-man" handle, safety levers, automatic brakes, live-rails, etc., and we were soon carrying on with a swing, the trains rapidly filling with passengers as soon as it was announced by the Wireless broadcast (for the Press of the country had at that time been manacled) that the line had been opened for passenger traffic. This was the beginning of the really interesting, not to say amusing part of the work, for we now had to face the audience, so to speak, and railway guards in general have from that date gone up greatly in my estimation, owing to the amount of patience, civility, and general knowledge of the geography of London that are expected of them.

It may be stated, however, that in normal times the trials of a professional guard are mild as compared to what they may be in a great strike for an amateur guard working under abnormal conditions. As all other forms of public conveyance were in a similar transitional state, the Underground trains were packed to their utmost capacity, or, even more so, with passengers during the rush hours of morning and evening, and it was a relief to all concerned when, each day, those hours were passed.

It was not, however, the numbers that mattered so much as their catechism concerning the strike, train connections, how to get to certain places, etc. A considerable proportion felt compelled to compliment the new "recruits" on their apparent efficiency (not to mention smart appearance etc.); many of the older folks insisted on shaking hands with us, others gave us chocolates, whilst girls smiled or giggled at us. Questions such as: "Have you had many accidents yet?" and "Do you anticipate danger or foul play?" met, of course, with such answers as they deserved.

Passengers at the mercy of the Strike put many questions, the answers to which, in many cases, could only have increased their mystification. One lady in tears, in a crowded train near the Mansion House Station one day, asked the writer if he could tell her how to get to Manchester! Some one had wrongly directed her to "Mansion House" instead. Though misdirection, unfortunately, was very

frequent, some of the new recruits were candid enough to admit their vague knowledge of the geography of the Metropolis and its railways, as, for example, the young fellow down from the 'Varsity who, on being asked if the train stopped at Charing Cross, replied: "Hanged if I can tell you, old chap, but jump in and see."

That there were incidents, amusing and otherwise, was of course only natural. One late evening a passenger who had strayed off the platform after the last train had left, and afterwards vociferously made his presence known to the neighbours and passers-by, had to be escorted along a tunnel, as the man with the station key had gone. A driver, on being complimented by some passengers (a common occurrence) on getting his train in a few minutes earlier than usual, remarked: "Thank the Lord I was able to pull up in time." Of course there were also "incidents" at the expense of the volunteers, such as the guard who, after waving his green flag, turned round to answer a question from a young lady and found himself left on the platform without his train. A very easy but dangerous mistake was for the guard to forget momentarily, whilst answering passengers, the direction in which the train was running. One sympathetic old lady remarked that she "hoped these fine fellows would retain their jobs after the strike."

One word of praise for the Company. They spared no efforts to make us comfortable and cheerful. They converted the exhibition buildings at Earl's Court into a huge canteen, providing food, drink, and smokes, as well as sleeping accommodation, for thousands; also amusements, including wireless with "super" loud-speakers, theatricals, etc. They also paid us well, whether we wanted it or not. Then, all of a sudden, just as we were becoming proficient, it was learnt that the Strike had collapsed, and we were again free to enjoy the usual routine that fitted our respective vocations.

H. F. M., 1926.

#### HORTICULTURAL ACTIVITIES IN BIRMINGHAM.

BIRMINGHAM being in the Black Country, it may surprise many to know that horticultural activities in and around this city are, we venture to think, ahead of other cities in the Provinces, and in the following notes we hope to convey to our readers a brighter impression of this city than they may already have.

Firstly, to consider our public parks: a number of these formerly private estates excel in the fact that they still retain the beauty of natural surroundings, due in some measure to the efficient manner in which these parks are controlled, inasmuch that trees are felled only by the sanction of the controlling committee. Our foremost park, *i. e.*, Cannon Hill, an area of 78 acres, whilst being but one and a half miles from the centre of the city, has surroundings to be compared

with many rural districts. Its trees are a feature to dwell upon, and include the following:—Beech, Chestnut, Oaks, and Elms, forming a stately background for other subjects, such as Copper Beech, Silver Birch, and numerous others of similar character. Mixed shrubberies, Flowering Cherries, Rhododendrons, and Roses make a pleasing groundwork.

The bedding schemes of Cannon Hill Park are noted throughout the Midlands for their great variety, including as a speciality the "Queen's Carpet-bed," a wonderful colour combination of plants adapted for this class of bedding. Other excellent displays are the special strain of Antirrhinums, involved in one mass of approximately 4000 plants, and Dahlias in great variety, giving charm with their colours until frost appears.

We cannot leave Cannon Hill Park without making mention of its fine Memorial, dedicated to the men of Birmingham who fell in the South African War. This Memorial has been placed in an appropriate setting of roses, which during the summer are carpeted with violas of blending colours.

A few figures regarding the Birmingham Parks Department may be of interest. There are 31 parks, each giving adequate facilities for various forms of recreation, 50 recreation grounds, and 19 open spaces, giving a total area of 2645 acres. In addition to this area, land is still being acquired by the Corporation for the further extension of its parks. Furthermore, the Corporation of recent years have taken over the beautiful Lickey Hills, which in the summer are a great attraction for holiday-makers in the Midlands. These hills consist of many coniferous woods and dales, mingling with stretches of heather; bilberries also abound in vast quantities.

The amateur gardener has great scope in Birmingham, being encouraged by willing members of the Birmingham Gardens Guild Movement, which, although at present in its infancy, has the promise of a great future, due very largely to the untiring efforts of its Secretary, Mr. W. H. Jenkin.

The Education Committee do all in its power to assist the allotment holders in that they provide courses of horticultural lectures by different lecturers of the district in the winter months. In conjunction, practical gardening classes are held at a nominal fee of five shillings, in return for which each student is given a plot of ground, seeds and implements are provided, and instructors for demonstrative purposes.

In conclusion, we should like to mention the Birmingham and Midland Counties Gardeners' Mutual Improvement Association, which holds fortnightly meetings, when interesting talks are given on horticultural subjects by prominent members of our profession. When we joined this Association we expected more or less to recall memories of Kew Mutuels, but we little expected to find ourselves with so many

past "Kewites," all, no doubt, having been prompted in the first place to join by their old associations with Kew.

By the foregoing remarks it will be readily seen that Birmingham's motto with regard to horticulture is an apt one, viz. "Forward."

T. P. & R. H.

## HORTICULTURE IN THE PROVINCE OF ONTARIO.

By HENRY J. MOORE, C.M.H.

THE southern part of the Province of Ontario contains large tracts of land which are eminently adapted to horticultural pursuits. No richer soil or one of a more diversified nature can be found elsewhere. In nature the soil ranges from the lightest sandy loams to those of heavy clay, through a series of splendid intermediate types which allow of a considerable choice for the culture of horticultural crops of many kinds.

*The Niagara Belt.*—The greatest horticultural belts lie along the southern shore of Lake Ontario, in what is known as the Niagara Peninsula, and along the northern shore of Lake Erie, this latter area being west and slightly south of the Niagara area. In the Niagara fruit-belt are grown grapes of many kinds, including Concord, Niagara, Moore's Early and Vergennes, also peaches such as Elberta, Crawford, and St. John, for which the area is noted all over the North American continent, to say nothing of apples, pears, plums, and quinces, all of which grow to perfection. Tempered by Lake Ontario on the north, and sheltered on the south by an escarpment one to three hundred feet high, this fruit-belt has no equal. Of such value is the land in the Niagara Peninsula fruit-belt that as much as £400 per acre has been paid, although there are thousands of acres available at one-fourth of this price.

*The Burlington Area.*—Extending from Burlington to Oakville, along the northern shores of Lake Ontario, but near its westerly end, is a rich area where apples, pears, peaches, cherries (these are also grown in all the fruit-belts), tomatoes, melons, and all manner of horticultural produce is grown. This region of many thousand acres is an after development of that of the Niagara Belt.

*The Lake Erie Belt.*—In the Lake Erie Belt, including the counties of Norfolk, Elgin, Kent, and Essex, and extending for more than one hundred miles westerly to Windsor, is an area where vast orchards of apples thrive splendidly, and where grapes and peaches are also grown to some extent. In this area an industry, that of growing, curing, and of manufacturing tobacco is rapidly developing. In the next few years fortunes undoubtedly will be made.

Sugar-beets are also grown in enormous quantities, and this, though not a horticultural crop, should be mentioned. Both tobacco and beets

being largely grown with the aid of Belgian labour, skilled British and other labour being scarce. Factories are now turning out large quantities of beet sugar.

*The Beaver Valley.*—Adjacent to the Georgian Bay and on its westerly side is the famous Beaver Valley, noted as an apple-producing area. Other hardy fruits are grown: peaches, however, are a little tender for this district. This area, like the Niagara Belt, is sheltered by low hills or an escarpment, and the climate tempered summer and winter by the afore-mentioned Bay. The largest town in the Beaver Valley district is Collingwood, a shipbuilding centre of about 6000 inhabitants.

*Durham and Northumberland Counties.*—In Durham and Northumberland counties, on the northern shores of Lake Ontario, is a fertile area, also noted for its apples. It is here that the famous MacIntosh Reds are largely produced. Hundreds of acres are now under cultivation. In all fruit-belts, however, as well as the one in question, Northern Spy, another well-known apple is grown, and others, such as Ontario King, Ben Davis, Snow Wagener, Baldwin, and Greening, produce excellent crops.

Not only are the soil and climate splendid for the production of fruits in certain areas, but also for the growth of practically all kinds of hardy shrubs and perennials. Nowhere do Gladioli, Pæonies, and Irises do better. It is, however, much the same with all herbaceous perennials. The extraordinary amount of sunlight and rains, which are adequate in normal years, make the horticultural sections of the Province ideal.

In Ontario the average summer temperature during the day is about 75° F. Very rarely indeed between the middle of May and the first of September does the daily temperature fall as low as 60° F. Sometimes, however, it will reach 90° F. or more in the shade. Even then the atmosphere is not unduly oppressive, as it lacks the extreme humidity characteristic of that of England, which, together with a high temperature, renders it uncomfortable.

It is true that the winter temperatures fall very low in Northern Ontario, in North latitude 48° sometimes as low as 50° below zero is registered, while in Southern Ontario, latitude 43°, 20° below zero is excessively low. In the fruit-belts, temperatures lower than 12° below are unusual.

The first thought in the mind of the reader of this article may be: How do the horticultural subjects endure the winter? It is true that in many cases they must be protected; largely, however, the deep covering of snow which annually falls is sufficient protection. As an instance of this, the English ivy will live below the snow-line in a temperature of 16° below zero; when, however, it peeps above the snow, its stems are always killed. Thus, except in the extreme south of the Province, it will not endure.

*Horticultural Organizations.*—In the Province of Ontario are various Associations composed of members who are engaged in various horticultural pursuits. The Ontario Horticultural Association, composed of societies of amateurs interested largely in floriculture and home beautification, has a membership of approximately 70,000. Two hundred and seventy-five societies comprise the Association at the present time. For purposes of instruction the Ontario Legislature makes an annual grant of \$20,000 (£5000), and employs a lecturer to the Association in addition. The Ontario Fruit Growers' Association, with 800 members, and the Vegetable Growers' Association, with 1200 members, are also supported in measure by the Legislature. In all, there are about 8000 fruit and vegetable growers in the Province.

There is no better way, perhaps, to arrive at an estimate of the value of horticultural activity in Ontario than to visit the Canadian National Exhibition—an annual institution in Toronto—and to inspect the wonderful displays of flowers, fruit, and vegetables. Or, for that matter, the Royal Winter Fair, also held annually at Toronto, where the greatest display of apples ever gathered together is shown, much of this display, however, being the product of British Columbia and other provinces. Another feature of the Royal Winter Fair is the display of chrysanthemums, which in size are not excelled by any grown in Great Britain, and the greenhouse-produced roses are exhibited in profusion; these, too, create a very delightful feature.

Wonderful as are the horticultural products of Ontario, her soil and climate are capable of producing a far greater range. Practically everything that can be grown in Great Britain can be grown in Ontario, with the exception of the broad-leaved evergreen and the half-hardy perennials. Think of grapes and peaches and apricots all out in the open! tobacco and maize (Indian corn), hemp, flax, melons in enormous quantities, egg-plants or aubergines, peppers or capsicums, tomatoes by the hundreds of thousands of tons, these being canned for domestic use and for export, in canneries adjacent to where grown. Even some varieties of water-melons ripen well in the Niagara Peninsula and elsewhere in Southern Ontario.

Ontario affords a great opportunity for those interested in commercial horticulture, especially to those with capital. As far as positions for trained gardeners are concerned, there are more men than positions. Many of the trained gardeners, however, drift into the United States. If a man has capital and will work, he has the power to build up a nice business in Ontario and to ensure comfort for his later years. His life in this or any Province should be as happy as in his native land. Our climate is exuberant; our scenery is inspiring. The magnitude of things takes a mental hold of men and puts new life into them. As a result of all this a splendid and virile race is springing into existence.

“Our Lady of the Snows,” of which Ontario is a very important

section, is rich in minerals; rich agriculturally; her lumbering and fisheries are yielding, and will continue for many years to yield, millions of dollars in revenue. The mines and agriculture of Ontario alone yield respectively \$400,000,000 annually. Canada is not only the fairest jewel, the richest Dominion in the British Empire, but is destined to become the greatest country in the world; its climate, resources, and God-fearing people are making it so. It has a population of only 8,000,000 people but a capacity to assimilate 300,000,000 at least. Ontario is playing a great part in its development and in the realm of horticultural activity; the people are making their homes attractive, and reflect in their beautiful settings the deepest sense of patriotism—that of a love of Home and Country.

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#### NOTES FROM JAPAN.

MR. K. YASHIRODA, in a letter dated October 20th, 1926, writes as follows:—"It may be of interest to know that this tiny island (Shozogun), which is situated about 60 miles south-west of Kobe, is the only place in Japan where the cultivation of olives is attended with any measure of success. The oil extracted from the fruits, however, is not comparable with that produced in Spain and France.

"On the sides of the cliffs *Conandron ramondioides*, an interesting gesneraceous plant, grows abundantly together with *Oreocharis primuloides*. In the mountains *Saxifraga sarmentosa*, *Lysimachia clethroides*, *Cotyledon Iwarenge*, *Drosera peltata* var. *lunata*, *Utricularia racemosa*, *Aconitum sinense*, *Angræcum falcatum*, *Cymbidium virescens*, *Dendrobium monile*, *Spiranthes australis*, *Lycoris radiata*, *Scilla japonica*, *Lilium tigrinum*, *Gardenia florida*, *Catalpa Kœmpferi*, *Clerodendron trichotomum*, *Trachelospermum jasminoides*, *Diospyros Lotus*, *Ardisia crispa*, *Rhododendron Kœmpferi*, and the beautiful and one of the rarest of Japanese plants, namely *Botryopleuron villosum*, flourish, and are typical of the flora of our island.

"With the approach of autumn, frosts are expected. Autumnal tints are a very fine sight at this time of the year, though much damage is done by thoughtless city dwellers who make excursions to this place and wantonly pluck branches from the shrubs and trees, and in particular from the maples, which are exceptionally beautiful.

"I read your notes on the flowering of *Amorphophallus Titanum* at Kew with much pleasure. It may interest you to know that our species in this noteworthy genus is *Amorphophallus Konjac*. This is one of the most important crops in Japan, and is known commercially as *konnyaku*. It is not grown in the extreme north of our country like many well-known *Liliums*, but it thrives in shady, moist, and fertile meadows where other crops cannot be grown with any measure of success. Its adaptability to ordinarily unsuitable conditions and its many uses



when harvested have made it a very important crop; our Department of Agriculture takes a special interest in its advancement. *Konnyaku* is a plant of a thousand uses apart from its value as a food; a glance at a speculative dealer's price list would add to your amazement.

"*Aralia cordata*, which is extensively grown and marketed, provides *Udo*, or Japanese Asparagus. It is said of Asparagus that 'a food which is only one-half per cent. edible cannot be spoken highly of'; but this cannot be applied to the succulent young growths of *Aralia cordata*, which has a flavour of its own. There are many vegetables and edible plants in Japan that have not yet been introduced into England. *Zingiber Mioga*, which is described by Dr. Hill in the *Botanical Magazine*, t. 8570, is connected with an old Japanese legend. It is said that a disciple of Buddha who was very fond of this plant forgot everything, even his own name; so the legend runs, 'those who eat *Mioga* forget everything.'

"It is with much pleasure that I recall my life in England. The lines of Alice Meynell's essays describe England as 'the better for the grey, soft, cloudy darkness of the sedge,' and these lines bring back to me very pleasant memories. On the 26th of May last I saw the beautiful fields of Kent and Sussex from the aeroplane by means of which I crossed to Paris. The May flowers were in full bloom, and I was struck with the impressiveness of the English coast-line; as G. K. Chesterton says, 'White chalk was piled . . . until it met the sky.' All too rapidly the coast-line faded from my field of vision, and with it my last sight of your beautiful, hospitable country—England!"

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#### NOTES FROM CENTRAL CHILE.

THE variation in temperatures and climatic conditions that obtain in Chile can be accounted for when we consider the length of the country in comparison to its breadth. On this account it is necessary for botanical purposes to divide the whole country into three zones. The north is practically desert, and it is from this arid, inhospitable region that many thousand tons of plant fertiliser in the form of Chilean nitrate are exported annually. Rain seldom falls, and consequently the vegetation is limited to isolated clumps of *Cereus* spp., a few rough spiny Bromeliads, and such-like xerophytes. What a contrast this area affords to the south zone, where it is said that it rains "thirteen months in every year!" From the Straits of Magellan to the north of Valdivia the coast is densely clothed with forests, and here is the home of most of the Chilean plants that are met with in English gardens. *Lapageria rosea* (the Copihæ), regarded as the national flower of Chile, is abundant, and is found growing all over the branches of even the tallest timber trees. *Drimys Winteri* is also found growing in profusion. Whole valleys are clothed with this magnificent tree, and it revels in the bottoms of the swampy valleys and often reaches a height

of 40 to 45 feet. It is an unforgettable sight to see large areas in full bloom towards the end of July and early August. It might be interesting to mention that this is regarded as the sacred tree of the Araucanian Indians, who inhabit the country. In these notes, however, I do not propose to deal at length with the aforementioned areas; the central zone, with which I am more familiar, and in particular the country around Santiago and Valparaiso, will for the moment furnish sufficient details for these brief notes,

In Central Chile it rains only in the winter months, although, of course, there are exceptional occasional rainstorms at other times, and in consequence the atmosphere is generally exceptionally dry. The flora may roughly be divided into two groups:—(a) Annuals and herbaceous perennials, which spring up with the winter rains and have a brief but gay life before being burnt up by the powerful sun and prolonged drought. Typical examples of this class are *Schizanthus* spp., which grow up annually in countless numbers, and *Eschscholzia californica*, which, though an introduced plant originally, now covers acres of rough country. (b) This group comprising stunted trees and bushes which are for the most part evergreen have thick, leathery foliage, and may be said to be drought-resistant. Two of the commonest and most typical of native trees are *Peumus Boldus* and *Cryptocarya Peumus*, but there are many similar which I have not yet been able to identify with certainty. It should be understood from these brief notes that horticulture in this part of the world is entirely dependent on irrigation. Near the Andes this is effected by diverting streams by means of ditches, but in the summer and drought period many of these dry up before the coast is reached. As a result of this, hundreds of acres of land are practically desert in summer and autumn. In some localities there is a plentiful supply of subterranean water, which is pumped by innumerable windmills.

For the most part the land is exceptionally fertile, and given a good water-supply, yields excellent crops. The more generally cultivated crops such as are met with in an English garden are grown together with a few more tender subjects. Tomatoes are extensively cultivated out of doors and maize is grown in large quantities. Aubergines, capsicums, and many species and varieties of Cucurbitaceæ (gourds, pumpkins, water-melons, etc.) are general crops. Near the coast, frosts are almost unknown, and broad beans and peas are sown in the autumn for early spring use. Beet, carrots, and turnips may be pulled all through the winter.

Many of the flowering shrubs and plants met with in England in greenhouses do extremely well in the open. Hydrangeas, for example, grown in half-shade make huge plants and bear larger heads of bloom than I have ever seen elsewhere. Acacias in variety grow freely, *A. dealbata* in particular making big trees. *Bougainvillea* spp., *Bignonia* spp., *Passiflora* spp., *Plumbago capensis*, and many other

tender climbers are extensively grown. Tree-ferns do well in part shade and many tender palms also. Species of *Phoenix* and *Jubaea spectabilis* are planted in full sun and in very dry situations, the latter attaining a very considerable height. All stone fruits do well, especially peaches and cherries; apples and pears require a moist situation to give the best results, but oranges, lemons, figs, walnuts, quinces, and *Diospyros Kaki* stand the drier conditions satisfactorily. Many plants are unable to stand the power of the tropical sun, while others simply grow weak and leggy. The common oak, for example, if planted with anything else or close together, grows so quickly that it is unable to support its own weight, and at the best is a very different tree from the sturdy specimens that we know so well in England. Wallflowers, indeed all species of *Cheiranthus*, grow tall and spindly, with only two or three flowers opening at a time, and many other plants behave in a similar manner. On the other hand, perpetual carnations and chrysanthemums do well, and with reasonable care produce really good blooms. It is very interesting to note how climatic variations affect different subjects, and it requires a couple of years' experience before one can feel any confidence in a newly-introduced plant. G. W. ROBINSON.

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#### THE ASSOCIATION OF KEW GARDENERS IN AMERICA.

THE Annual Meeting of the Association of Kew Gardeners in America was held at the Hotel Brunswick, Boston, Mass., U.S.A., on Saturday, March 20th, 1926. Dinner was served at 6.30 p.m. Those present were Mr. E. H. Wilson, Miss Muriel Wilson, Miss B. V. Mumford, Mr. and Mrs. Lazenby, Mr. F. W. Lazenby, Mr. T. D. Hatfield, Miss Hatfield, Mr. and Mrs. W. H. Judd, Mr. M. Free, Mr. H. E. Downer, Mr. J. Ellis, and Mr. J. A. Semple. After dinner Mr. Wilson presided, and the Report of the meeting held a year previously was read by the Secretary. The Financial Report showed a balance in hand of \$21.58.

Mr. H. E. Downer was called upon, and gave a very interesting talk on a recent trip made by himself and Mr. M. Free to some of the islands of the West Indies. Incidentally, he related that both were celebrating the anniversary of their arrival in the United States (first landing there some fourteen years ago). Mr. Downer said that the trip to the West Indies was the result of a suggestion by Mr. Free, and they left New York on December 18, 1925. On the 23rd of December the Island of St. Thomas, one of the Virgin Islands, was reached. Near the town of Charlotte Amalie they visited the garden of Mr. Fairchild, situated at an elevation of 1600 feet, from which place delightful views were obtained. Here many succulent plants were seen growing, and

*Stapelia gigantea* and *Cereus grandiflorus* were especially noticeable. Other plants which called for attention were *Solandra grandiflora* (though just passing out of flower), *Bougainvillea spectabilis*, *Grevillea robusta*, and young trees of *Sweitenia mahogany*. Impressions gained here were that both the soil and the inhabitants were very badly off. The chief industry on the island appeared to be the manufacture of bay rum. Close by the Island of St. Croix was visited, and here it was possible to hire an automobile to go sightseeing, but speed and noise appeared to be the standard of efficiency among the coloured chauffeurs. This island is of coral limestone formation, and while here an experimental station was visited, where onions, peppers, cucumbers, and tomatoes were under cultivation, in addition to twelve hundred varieties of the Sweet Potato, the object being to encourage planters to grow other crops than Sugar-Cane. A hedge of *Tecoma stans*, fifteen feet high, was seen, and along the roadside to Frederiksted were numerous Coconut Palms. Many of the sugar mills on the island were in ruins.

Leaving St. Croix, the travellers were aroused at 3.30 A.M. on Christmas Day to find the boat had reached Basseterre, the port for the Island of St. Kitts, and at this early hour of the day viewed for the first time the Southern Cross. St. Kitts impressed the visitors with being a very fertile island and under a good state of cultivation. Here were seen Breadfruit trees, Royal Palms, large Bougainvilleas, Allamandas, and splendid trees of *Barringtonia speciosa*. The Botanical Gardens contained many interesting succulents, hedges of *Bougainvillea glabra*, and beds of Roses and Chrysanthemums! The only poor feature that was particularly noticeable was the lawns. The Island of Nevis close by was not visited, and while a call was made by the boat at Antigua they did not go ashore. The day after Christmas Day the Island of Guadeloupe was reached, and they landed at Point à Pitre, where the country is flat, but on the north side the mountain scenery was very imposing. Dominica was the next island of call, and proved a very interesting one to our two fellow Kewites, for here at the Botanic Gardens, situated at a high elevation in delightful surroundings, they met Joseph Jones, who retired in March 1925 after laying out the Gardens and residing there in charge since 1892. Here they also met F. G. Harcourt and J. W. Wright, so that a reunion of five Kew men was held for the first time on the Island of Dominica. Harcourt's turkey was completely demolished! The chief industry here is the cultivation of Limes, but difficulties are met with in persuading the natives to work, and a disease called "wither-tip" is giving some concern. The visitors were much impressed by the lay-out of the Garden, the healthy condition of the fine collection of ornamental and economic plants, and the splendid condition of the lawns. Out of a population of some 30,000 on the island, only 100 are white. Leaving here they arrived at Forte de France, the principal town on the Island of Martinique. In the public park stands an imposing statue of the Empress Josephine.

Splendid Hibiscus, Royal Palms, and Breadfruit trees were much admired here. On the way from Martinique the famous Diamond Rock was passed, which figures in the records of the British Navy as H.M.S. "Diamond Rock." A short run brought them to Port Castries, an interesting town on the Island of St. Lucia. The numerous mountain-peaks afford enchanting scenery, and they went ashore in the moonlight while coaling operations were in progress. The next stop was at Bridgetown, on the Island of Barbados, an island approximately the size of the Isle of Wight, not very mountainous, in a good state of cultivation, and thickly populated with about 200,000 people. The climate is said to be almost perfect, due to the ever-blowing trade-winds. The effect on the trees is very marked as their heads are inclined from the wind. In a churchyard at Bridgetown a tombstone bearing the date 1666 was noticed. While here the M.C.C. cricket team arrived and created some excitement. The painted walls of the houses and the gay flowers made very colourful effects, which were also apparent at most of the places visited. Beds of Marigolds and Zinnias were noticed in the Queen's Park, but they did not seem to be really happy in the Tropics.

They stayed at Barbados two days, and hired a car and drove to Bathsheba, where the shells on the beach were fascinating and the surf effects on the Atlantic shore very fine. The next and final stop on the way south was at Port-of-Spain, on the Island of Trinidad, where two days were spent with R. O. Williams at the Botanic Gardens. On the island was seen a plantation of Bamboos covering 1000 acres, planted for paper-making. The Citrus plantations were visited and ripe fruit, though green in colour, was much enjoyed. The second day with Williams they visited the rain forest, passing through a cocoa plantation. Up in the rain forest, leaves of *Alocasias* did service for umbrellas, and ferns, both filmy and tree forms, were common. A parasitic species of *Clusia*, commonly called "Scotch Attorney," attaches itself to the trees here and eventually kills them. New Year's Day was spent at Port-of-Spain, and on this day the racecourse was the main attraction for most of the population. Hindoos, who number about 88,000 on the island, were present in great numbers, very much bejewelled and clothed in multi-covered garments. The return trip was made from Trinidad that evening, and the same islands called at as on the outward journey, but they only went ashore at Dominica and made another call on Harcourt. Out of the twenty-three days the trip occupied, the only disagreeable ones were the last two before reaching New York.

Mr. Downer's talk was much appreciated and enjoyed, and at the end Mr. Free added a few impressions of the native customs and Mr. Downer entertained us with the modern version of the "The House that Jack Built," so well remembered by those of us who were with him at Kew.

It was moved by Mr. Downer and seconded by Mr. Lazenby that the next meeting be held on Saturday, April 2nd, 1927, on the occasion of the Spring Show at Boston.

W. H. JUDD, *Secretary-Treasurer.*

## IN MEMORIAM.

WALTER H. AGGETT.

We regret having to record the death of Walter H. Aggett on August 21st, 1926. Our deceased friend retired from the position of Garden Superintendent of the Borough of Bermondsey in April 1923. He had served the Borough for upwards of thirty years, and was held in very high esteem by those who were privileged to work under his direction. During that time he was directly responsible for the many improvements that were undertaken in the streets and open spaces in this populous London suburb. Many thousands of trees were planted in the seventy miles of thoroughfares, and earned for Bermondsey the reputation of being one of the most sylvan districts in the Metropolis.

Mr. Aggett commenced his gardening career in Devonshire in the gardens of Lord Charles Bentinck, and was subsequently appointed foreman at Delamore Gardens, Ivy Bridge, Devon. From the latter place he went to Kew, entering the Royal Botanic Gardens, on March 15th, 1887. He left Kew in June 1888. His first appointment, as head gardener, was to Sir Herbert Jekyll, at Oakdene, Guildford, Surrey, where he spent many happy days, for his employer was a great garden enthusiast. This estate was, however, disposed of later, and Mr. Aggett went to the Public Gardens, Lambeth. The opportunity presented itself, and a very short time afterwards he applied for the position of gardener to the Bermondsey Council, and was the successful candidate.

Much hard work was necessary to make the three small parks comparable with those of the other surrounding districts. Nothing daunted him, and in the face of many difficulties Mr. Aggett brought his charges to such a degree of perfection that the open spaces became a revelation to the neighbouring localities. During the years of the Great War our late fellow-Kewite displayed much foresight, and all the available vacant spaces in the Borough were cultivated by enthusiastic allotment holders at his instigation. He readily gave advice and assistance whenever called upon, and did much to popularise gardening in the Bermondsey district.

Mr. Aggett made many friends, and he always spoke of the days which he spent at Kew as a young man as the happiest period of his life. He leaves a widow, to whom we offer our heartfelt sympathy in her sad loss.

[We are indebted to the editors of the *Gardeners' Chronicle* for the loan of the electro which accompanies the memoir.—EDITOR.]

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## JOSEPH DALGARNO.

We regret to record the death of Mr. Joseph Dalgarno, who died suddenly at his residence in Aberdeen on April 16th, 1926, at the age of 74 years. Mr. Dalgarno was born in Aberdeen and entered the Royal Botanic Gardens, Kew, on May 2nd, 1870, leaving to take up a position

at Montrose a year later. He was subsequently employed in Dumbar-tonshire, but, being of an ambitious nature, decided to return to his native city, where he built up an extensive nursery business at the Whitehall Nurseries. Of later years our deceased friend devoted much of his time to tomato-growing, and during the season specialised in chrysanthemum culture. Many bowling greens and cricket pitches in Aberdeen were laid out under his personal supervision, and his services were always in demand in this section of his business.

Mr. Dalgarno was a well-read man and of an inventive mind, and from time to time devised and patented labour-saving horticultural implements, many of which are now included in the equipment of the largest nurseries in this country.

Mr. Dalgarno was predeceased by his wife some years ago, and is survived by four sons and four daughters, one of whom, Mr. F. C. Dalgarno, is Park Superintendent at Bowes Museum Park, Barnard Castle, Co. Durham.

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CHARLES MARON

(Chevalier de la Légion d'Honneur; Officer du Mérite Agricole).

1851-1926.

The passing from our midst of our venerated friend removes from our ranks a most distinguished French Kewite, and from the continental horticultural world a master of no mean attainments, who played a very conspicuous part in the inception of scientific plant breeding.

To Charles Maron horticulture owes some of those early Bromeliad and orchid hybrids which proved such an incentive in the hybridisation of these interesting plants. As a scientific cultivator he contributed a great deal to the advancement and development of orchid culture on systematical lines. His widespread knowledge of botanical geography, plant distribution, and botanical affinities enabled him to hold opinion far in advance of his times, and the possibilities of natural hybrids awakened in his soul a real fascination for his researches.

Maron was the son of a modest but well-read gardener, who no doubt contributed to a great extent in shaping the destiny of the master-to-be. His early craving for experience led him to join the Parks and Gardens Department of the City of Paris, where he found ample scope for his intellect. He, however, soon developed those feelings which characterise high ideals, and very much against the wishes of his family he came to England. He entered Kew in August 1875, where he found the field he had searched for, and where he took a keen interest in its magnificent collections. Maron left Kew in April 1876, not to return home, but to further extend his knowledge and to master the English language fluently. On his return to France he was given charge of the famous Herbault Collections, where, in 1882, he produced his first Bromeliad hybrid, *Billbergia Herbaultii*. His early success was quickly followed by many other Bromeliad hybrids: space will not permit me to mention many, but it will be of interest to note *Pitcairnia Maronii* and *Pitcairnia Darblayana*.

From 1885 to 1894 he had charge of the Darblay Collections, where he again found still wider scope for his experimental research. He soon produced his first *Canna* hybrid (*C.* "*Johanny Sallier*"). In 1894 or

thereabouts Maron's services were secured by M. Fournier, the great orchid enthusiast, whose establishment at La Cavalière, St. Barnabas, Marseilles, proved a still greater opportunity for research and study. It was at this place that Maron produced his first *Vanda* hybrid (*V. Marguerite Maron*), to be followed by the wonderful *Laelio-Cattleya intermedia flava*. The rapidity of growth of this hybrid became a revelation, and opened a totally new era in the cultivation of orchids from a speculative standpoint. Seeds of this hybrid were first sown in March 1894, and the resultant plants flowered in October 1896.

Maron still aimed at greater achievements, and with the close of the nineteenth century founded his world-famous nursery at Brunoy (Seine-et-Oise), from which he obtained a First Prize of Honour at the Universal Exhibition in the year 1900. Ten years later he took into partnership his sons, Henri and André, creating the now well-known business of Charles Maron et fils. At this establishment some interesting hybrids have originated. In 1925 their hybrid, *Cattleya Mondoni*, secured the "Julien Potin" prize for the best hybrid of the year. It is impossible to mention the many awards that have been conferred on the products of our late member's nurseries. Charles Maron was a keen exhibitor, and was represented at the principal exhibitions throughout Europe, at Milan, Liège, Brussels, Ghent, at all the great French centres, and often in England. He naturally enjoyed a great reputation, and was repeatedly selected as President of the Jury at the most important exhibitions in France and elsewhere in Europe. He was also a splendid author, and his work on Ferns, published in 1896, is still the standard French work on the subject.

Like most self-made men, Maron could impart the experience of years in a few words. In due recognition of his wonderful attainments and unflinching affability, the writer begs leave to place on record within the pages of this *Journal* the brief outlines of an exemplary career.

A. E. P. G., 1926.

[We are indebted to *La Societe Nationale d'Horticulture de France* for the loan of the electro which illustrates this memoir.—EDITOR.]

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#### MATILDA SMITH, A.L.S.

Kewites will learn with much regret of the passing of a well-known and much respected member of the Guild, Miss Matilda Smith, on January 5th, 1927.

Miss Smith's association with Kew began in 1878, when the late Sir Joseph Hooker was endeavouring to secure a competent scientific artist to supply the drawings for the *Botanical Magazine*, of which, as Director of the Gardens, he was editor. Miss Smith was already a skilled artist, and Sir Joseph was fortunately able to persuade her to come to Kew and undergo the training necessary for portraying botanical subjects. From 1881 onwards Miss Smith became artist and lithographer for the *Icones Plantarum*, and two years later in 1883 for the *Botanical Magazine* also. The excellence of these drawings with their very full floral analyses is generally acknowledged, and they present a permanent record of Miss Smith's skill in re-animating dried, flattened specimens which were often of an imperfect character. Another important branch of her work was the drawing of new and interesting plants which flowered in the Gardens; further, the making of facsimile copies



of plates missing from volumes in the Library, and so rendering incomplete books more useful and valuable; this was but another phase of her busy life.

To mention the many botanical works illustrated by Miss Smith while actively engaged would be an impossibility in the restricted space at our disposal, but it will be of interest to mention the following:—‘The Botany of the “Challenger” Expedition’; Balfour’s ‘Flora of Socotra’; Aitchison’s ‘Botany of Afghanistan’; Collett’s ‘Flora Simlensis’; Cheeseman’s ‘Illustrations of New Zealand Plants’; Watt’s ‘Cotton Plants’; and Johnston’s book on Liberia.

In 1898 the Board of Agriculture agreed to the appointment of an artist for two days per week, and Miss Smith was chosen for the post. This arrangement left her free to continue with her work for the *Icones Plantarum* and the *Botanical Magazine*.

Her association with Sir Joseph Hooker remained a very cordial one until his death in December 1911, and she was much gratified by being permitted to contribute the botanical designs which figure on his Memorial Tablet in St. Anne’s Church, Kew.

In 1916 Miss Smith was elected President of the Kew Guild, and during her year of office was untiring in her efforts to promote a closer fellowship among members (see *Kew Guild Journal*, vol. iii. p. 265).

On the 29th July, 1921, Miss Smith retired from the Public Service under the regulations applicable to members of the Civil Service. To quote from the *Kew Bulletin* of that year:—“The devotion to duty which has marked Miss Smith’s tenure of her post during the past twenty-three years has placed Kew under an obligation it is not easy to assess. Moreover, the labours of Miss Smith as an official member of the Herbarium staff constitute but a small portion of her services to this Institution.”

On November 3rd, 1921, she was elected an Associate of the Linnean Society in recognition of her services to Botanical Science.

After her retirement Miss Smith continued to live in Kew, where she devoted her time to parochial matters. She was an energetic member of the local Church Council and was editor of the St. Anne’s Parish Magazine. For some time she was also a member of the Richmond Board of Guardians. Her health had been failing for some months, but the suddenness of her passing came as a great shock to the many friends she had gathered around her while resident in Kew. A few days before her death the Council of the Royal Horticultural Society announced the award of the Silver Veitch Memorial Medal and a sum of £25 in recognition of her skill as a botanical artist, and in particular with reference to her work in connection with the *Botanical Magazine*.

The funeral service was held in the Parish Church at Kew on January 9th, 1927, and was attended by a large number of the Kew staff as well as local residents. The interment took place in Richmond Cemetery.

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#### EDWIN CHART, M.V.O.

Another link with the past has been severed by the death of Mr. Edwin Chart, M.V.O., who for several years was Clerk of the Works at Kew. Mr. Chart was born in 1848, and entering H.M. Office of Works in 1866, became Resident Architect at Hampton Court Palace in 1877. On the death of Mr. Jurd in 1888, Mr. Chart took over the

control of the Works Department at Kew, and continued to superintend matters there until Mr. Justin Allen was appointed in 1898 (see *Kew Guild Journal*, 1924, p. 257). Mr. Chart retired from the service in 1913 and went to reside at Redhill, where he died on the 10th of September, 1926, and was buried at Mitcham Cemetery. He was a regular attendant at the Garden Staff Dinners, which were the precursors of those of the Kew Guild.

C. H. W.

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W. H. ETTERLEY and JAMES UDALE, F.L.S.

As we go to press we learn with much regret of the passing of Mr. W. H. Etterley, lately Assistant Superintendent of Parks and Gardens, Shanghai, China, and Mr. James Udale, F.L.S., the well-known nurseryman of Droitwich, Cheshire. Illustrated memoirs will be included in our next number, but we take this opportunity of expressing our sympathy with the relatives of these well-known Members of the Kew Guild in the loss they have sustained.

KEW STAFF (*January 1, 1927*).

(*The names of Life Members are preceded by an asterisk.*)

	<i>Entered Kew.</i>
Director .....	*Arthur W. Hill, C.M.G., M.A., Sc.D., F.R.S., F.L.S. .... 1907
Assistant Director .....	Major T. F. Chipp, M.C., B.Sc., Ph.D., F.L.S. .... 1906†
Assistant .....	John Aikman ..... 1888†
Clerical Officer .....	S. F. Ormsby ..... 1923
Keeper of Herbarium and Library .....	A. D. Cotton, F.L.S. .... 1904
Assistant .....	Charles Henry Wright, A.L.S. .... 1884
" .....	*Sidney Alfred Skan ..... 1892†
" .....	Thomas A. Spragne, B.Sc., F.L.S. .... 1900
" .....	*Miss Elsie M. Wakefield, M.A., F.L.S. .... 1910
" .....	William B. Turrill, M.Sc., F.L.S. . 1909
" .....	John Hutchinson, F.L.S. .... 1904†
" .....	Cecil V. B. Marquand, M.A., F.L.S. 1923
" .....	V. S. Summerhayes, B.Sc. .... 1924
" for India .....	C. E. C. Fischer ..... 1925
" for South Africa .....	Miss I. C. Verdoorn ..... 1925
" for West Africa .....	J. M. Dalziel, M.D., B.Sc., F.L.S. ... 1924
Botanical Artist .....	Gerald Atkinson ..... 1922
Sub-Assistant (Index Kewensis) .....	Miss M. L. Green, B.A., F.L.S. .... 1912
" (Library) .....	Ernest Nelmes ..... 1920†
Assistant (Temporary Technical) .....	Miss Ada F. Fitch ..... 1892
" " " .....	Miss Mabel I. Skan ..... 1919
" " " .....	Miss Connie Hillier ..... 1922
" " " .....	Frederick C. Woodgate ..... 1922
" " " .....	Charles E. Hubbard ..... 1920†
" " " .....	William E. Trevithick ..... 1920†
" " " .....	H. K. A. Shaw ..... 1925
" " " .....	Miss Maud Duke ..... 1925
Temporary Botanist .....	*Stephen T. Dunn, B.A. .... 1898
" " .....	A. R. Horwood ..... 1924
" " .....	N. Y. Sandwith ..... 1924
" " .....	J. E. Dandy ..... 1925
Assistant Keeper, Jodrell Laboratory	Leonard A. Boodle, F.L.S. .... 1904
Keeper of Museums .....	*William Dallimore ..... 1891†
Assistant .....	*John Henry Holland, F.L.S. .... 1895†
" .....	F. N. Howes, M.Sc., F.L.S. .... 1926
Preparer .....	Laurence J. Harding ..... 1913
Curator of the Gardens .....	*William J. Bean, L.S.O., V.M.H. ... 1883†
Assistant .....	*William Nicholls Winn ..... 1890†
Assistant Curators:—	
Herbaceous Department .....	*Walter Irving ..... 1890†
Arboretum .....	*Arthur Osborn ..... 1899†
Decorative Department .....	*John Coutts ..... 1896†
Tropical Department .....	*Thomas W. Taylor ..... 1902†
Temperate Department .....	*Charles P. Raffill ..... 1898†
Clerical Officer .....	Reginald F. Williams ..... 1923
Clerk .....	Ernest G. Dunk ..... 1914†
" (Temporary) .....	E. W. S. Welsh ..... 1924

† Formerly a Student-Gardener at Kew.

		<i>Entered Kew.</i>
Shorthand Typist .....	Miss I. Watters.....	1925
"    " .....	Miss M. Ovington-Jones .....	1925
"    " .....	Miss K. Froome.....	1925
Sergeant-Constable .....	Walter Linney .....	1892
Packer .....	Harry W. Ruck .....	1907†
Superintendent of Works .....	J. E. Holman .....	1912

† Formerly a Student-Gardener at Kew.

#### SUB-FOREMAN AND ARBORETUM PROPAGATOR.

<i>Department.</i>	<i>Name.</i>	<i>Entered Kew.</i>	<i>Previous Situation.</i>
Arboretum .....	Francis P. Knight.	19 Feb., 1923.	Royal Botanic Garden, Edinburgh.
Temperate House.	George J. W. Ford.	8 June, 1925.	Botanic Gardens, Cam- bridge.
Temp. House Pits.	Fredk. S. Banfield.	17 Sept., 1923.	Chiswick House, Chis- wick, W. 4.
Palm House .....	Eric G. Godseff ...	4 Jan., 1926.	Lowther Castle Gardens, Penrith.
Orchids & T. Range	James Robbie .....	4 Aug., 1925.	Blythwood Gardens, Pin- ner.
Fereries.....	Lewis Stenning ...	16 Feb., 1925.	Botanic Gardens, Oxford.
Rock Garden .....	Thomas D. Boyd .	24 Sept., 1923.	The Gardens, Knowsley, Lancs.
Herbaceous.....	John G. Grant ...	31 Dec., 1923.	Barley Wood, Wroughton, Somerset.
Decorative .....	Arthur G. Hopkins.	7 Nov., 1922.	Botanic Gardens, Cam- bridge.
Flower Garden ...	Edward V. Willoughby.	7 Jan., 1924.	Froyle Place, Alton, Hants.
Propagating Pits .	Oliver B. Orchard .	5 Aug., 1924.	Scadbury Park, Chisle- hurst.

#### STUDENT-GARDENERS.

<i>Name.</i>	<i>Entered Kew.</i>	<i>Previous Situation.</i>
Bertram W. Allison .....	26 April, 1926 ...	Lees Court, Sheldwick, Faversham.
Francis A. Barham .....	30 Mar., 1925 ...	Bootle Parks and Gardens Depart- ment.
Victor G. Barham .....	12 Oct., 1925 ...	Polapit Tamar, Launceston.
William E. Bassett .....	27 Oct., 1924 ...	Cockenach Park, Royston, Herts.
William H. Bromley .....	13 July, 1925 ...	Perry's Hardy Plant Farm, Enfield.
Arthur G. Brown .....	22 June, 1925 ...	Torwood, Wimbledon, S.W. 19.
Aubrey J. W. Cheek .....	8 Feb., 1925 ...	L.C.C. Parks Department, London, S.E. 1.
Leslie Cook .....	29 May, 1926 ...	Royal Gardens, Windsor.
Lewis Durchanek .....	15 July, 1926 ...	Sander et Fils, Bruges, Belgium.
Joseph W. England .....	11 May, 1925 ...	Cyfartha Castle Gardens, S. Wales.
Mario Ercoli .....	5 July, 1926 ...	La Mortola, Ventimiglia, Italy.
Thomas H. Everett .....	23 Feb., 1925 ...	Cheadle Royal, Cheadle, Cheshire.
Walter Everitt .....	12 July, 1926 ...	The Gardens, Mulgrave Castle, Whitby.
James E. Farmer .....	18 Oct., 1926 ...	Burford Gardens, Dorking.
Martin C. Goldsmith.....	16 Mar., 1925 ...	Wyberlye, Burgess Hill, Sussex.
Leonard C. Hendon .....	13 Sept., 1926 ...	John Innes Hort. Inst., Merton.
Donovan E. Horton .....	10 Jan., 1927 ...	Anth. Kluis' Nurseries, Boskoop, Holland.
Wilfred C. Ibbett .....	16 Nov., 1925 ...	Cambridge Botanic Garden.
Hedley H. Jarman.....	25 May, 1926 ...	Hyde Park, London, W. 2.

<i>Name.</i>	<i>Entered Kew.</i>	<i>Previous Situation.</i>
John Lawson	6 April, 1926	Glasgow Botanic Gardens.
James H. Lock	14 Sept., 1925	R.H.S. Gardens, Wisley.
Herbert F. Mayne	10 May, 1926	King's Acre Nurseries, Hereford.
Kenneth McCready	6 Dec., 1926	Aldenham House Gardens, Elstree.
Charles McGregor	22 June, 1925	Royal Gardens, Sandringham.
Robert C. McMillan	29 June, 1925	Albert Agricultural College, Glasnevin.
John C. Nauen	25 Jan., 1926	The Greenway Nurseries, Taunton.
William Nelmes	10 May, 1926	Messrs. L. R. Russell, Limited, Richmond.
Frederick Richards	23 Feb., 1925	"Cromlix," Chislehurst, Kent.
Herbert Ritchings	28 April, 1924	John Innes Hort. Inst., Merton.
Stephen J. Roberts	22 June, 1925	Aldenham House Gardens, Elstree.
William G. Rutter	22 Nov., 1926	John Innes Hort Inst., Merton.
William E. Stewart	16 Aug., 1926	Messrs. Bakers, Codsall, Wolverhampton.
Charles R. Stock	27 April, 1925	Denham Court Gardens, Denham.
Ernest W. Studley	8 Nov., 1926	John Innes Hort. Inst., Merton.
Frank W. Thorns	5 June, 1926	Burford Gardens, Dorking.
Percy Trevaskis	20 April, 1925	Aldenham House Gardens, Elstree.
Alfred E. Wise	10 Nov., 1924	Hall Barn Gardens, Beaconsfield.

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IMPROVER GARDENERS.

A. W. Ivey.

J. R. Sealy.

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THE ANNUAL GENERAL MEETING, 1927.

THE Annual General Meeting and Dinner for 1927 have been arranged to be held on Thursday, May 26th, at the Clarendon Restaurant, 1, 3 and 5, The Broadway, Hammersmith, W. 6. Members not receiving further details should communicate with the Secretary as soon as possible previous to that date. Tickets for the Dinner will be 7s. each (exclusive of wines).

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The firms whose advertisements appear in the present issue are all of the highest standing. Many of them, indeed, have stocks of seeds, plants, etc., which cannot be obtained elsewhere. The revenue from these advertisements appreciably diminishes the cost of publication of the *Journal*; such revenue it is very desirable to maintain, and, if possible, to increase. Members are therefore asked to give our friends their support whenever possible, and when ordering, or even submitting enquiries, please do not fail to mention the *Kew Guild Journal*,

## OLD KEWITES.

(The names of Life Members are preceded by an asterisk.)

Name.	Left Kew.	Present Position and Address †.
*Abbott, James M. ....	Sept. 1898 ..	F., Park Farm, Woking Village, Surrey.
Adams, R. ....	April 1903 ..	St. Joseph's Hospital, Burlington Lane, Chiswick.
Adamson, John ....	July 1909 ..	N., Moniaive, Dumfriesshire.
Agate, C. J. ....	April 1926 ..	"Greystones, Yonkers, New York, U.S.A.
*Aikman, Miss M. G. ....	Nov. 1924 ..	40 Mortlake Rd., Kew, Surrey.
*Alcock, Mrs. N. L., F.L.S.	Nov. 1918 ..	Dept. of Botany, Royal Botanic Garden, Edinburgh.
*Allen, C. E. F. ....	Feb. 1904 ..	Supt. Agric., Port Darwin, N. Territory, Austr.
*Allt, W. S. ....	Jan. 1911 ..	Poughkeepsie, New York, U.S.A.
Anderson, A. W. C. ....	Feb. 1926 ..	Botanic Gardens, Dunedin, N.Z.
*Anderson, J. R. ....	Oct. 1905 ..	
*Anderson, J. W. ....	June 1910 ..	Minneapolis, Cynwyd, N. Wales.
Andrews, C. ....	Oct. 1922 ..	F., Tresco Abbey, Scilly Islands.
Archer, Sydney ....	Mar. 1895.	
*Arden, Stanley ....	June 1900 ..	c/o National Bank of Australasia, Adelaide, S. Australia.
*Armbrecht, Otto ....	Jan. 1898 ..	Derneburg, Prov. Hanover, Germany.
Armstrong, James. ....	Mar. 1893 ..	H.G., Hardcourt, North Andover, Mass., U.S.A.
*Armstrong, Robert ....	Oct. 1897 ..	170 Bartlett Av., Toronto, Ontario, Canada.
*Arnold, George ....	Oct. 1894 ..	Essex.
*Arthur, Alec ....	April 1899 ..	U.S.A.
Ashlee, T. R. ....	April 1910 ..	Kerrisdale P.O., British Columbia.
Astley, James ....	Nov. 1898.	Vancouver, B.C., Canada.
Attenborough, F. ....	Feb. 1896 ..	H.G., Annesley Ho., Villa Rd., Nottingham.
*Aubrey, A. E. ....	April 1910 ..	Brookfield, Bellbroughton, Stourbridge.
Augull, Karl ....	July 1902 ..	N., Latvia Dobe, Vecvagar, Russia.
*Auton, William J. ....	Feb. 1897 ..	H. G., Pyrford Court, Woking.
Avins, Charles W. ....	Oct. 1894.	
*Badgery, R. ....	Aug. 1906 ..	Supt., Bot. Gdns., Saharanpur, India.
Baggesen, Niels ....	Dec. 1900 ..	Hardy Plant Nursery, Pembury, Tunbridge Wells.
Bailey, A. G., B.A. ....	Dec. 1915 ..	Dept. Agric., Kenya Colony.
Bailey, Thomas ....	Sept. 1892 ..	Ravenscourt Park, W. 6.
*Baker, A. F. ....	April 1920 ..	Asst. Supt. of Pks. & Fst., Box 288, King's Pk., Bloemfontein, S.A.
Baker, E. ....	Oct. 1920 ..	Garston Manor Gdns., nr. Watford, Herts.
Baker, G. A. ....	Jan. 1911 ..	N., Buller Rd., Laindon, Essex.
Baker, William G. ....	Dec. 1887 ..	C., Bot. Gardens, Oxford.
Bale, J. H. ....	Mar. 1909 ..	Folly Farm, Sulhampstead, nr. Reading.
*Balen, J. C. van ....	Mar. 1919 ..	c/o Municipal Gardens, Cape Town, S.A.
Bally, P. ....	Aug. 1916 ..	425 Salisbury Street, Worcester, Mass., U.S.A.
*Band, R. ....	Oct. 1908 ..	P.O. Box 206, Accra, Gold Coast.
Banks, G. H. ....	Mar. 1906 ..	C., Botanic Gardens, Glasgow.
*Barker, Michael ....	Mar. 1884 ..	228 Pleasant St., Oak Park, Ill., U.S.A.
*Barker, W. H., N.D.H. ....	Mar. 1923 ..	361 Durnsford Rd., Wimbledon, S.W. 19.
Barnett, M. J. ....	April 1914 ..	C., Public Gardens, Oamaru, New Zealand.
*Bartlett, A. C. ....	May 1898 ..	Land. Gard., 318 Kew Rd., Kew, Surrey.

† Abbreviations: H. G.=Head Gardener; F.=Foreman; N.=Nurseryman; M. G.=Market Gardener; O.=Curator; D.=Director; M.=Manager; B. G.=Botanic Garden.

<i>Name.</i>	<i>Left Kew.</i>	<i>Present Position and Address.</i>
Barton, Robert .....	June 1890 ..	P.O. Box 57, Hamden, Conn., U.S.A.
Bass, A. P. ....	Nov. 1922 ..	Botanic Gardens, Oxford
Bass, Edward. ....	Mar. 1899.	
Bass, Thomas. ....	Mar. 1899 ..	13 Friar's Stile Rd., Richmond, Surrey.
Bates, A. J. ....	June 1922.	
*Bates, G. ....	Feb. 1904 ..	1 Clifden Place, New St., Westerham, Kent.
Batters, Frederick H. ..	Feb. 1891 ..	c/o Messrs. Cutbush, Nurs., Highgate, N. 6.
Baum, Jacob .....	July 1900 ..	N., Pallud sur Vevey, Switzerland.
*Baumann, Ludwig ....	Mar. 1902 ..	3233 Portis Ave., St. Louis, Mo., U.S.A.
Baumgardt, Hilding ....	Mar. 1902.	
Beale, J. H. ....	Apr. 1911 ..	Boyce-Thompson Inst., Yonkers, N.Y., U.S.A.
*Beatty, E. J. ....	Nov. 1905 ..	H.G., Dupplin Castle, Perth, N.B.
Beer, A. ....	Mar. 1919 ..	University Bot. Gdns., Innsbruck, Tyrol.
*Behnick, A. ....	Dec. 1906 ..	H.G., Gruson, Magdeburg, Germany.
*Bell, Miss V. S. <i>See Mrs.</i>	Warner.	
*Benbow, Joseph. ....	Sept. 1884 ..	c/o C. Hanbury, Esq., F.L.S., Kingston Maurward, Dorchester, Dorset.
Bennett, F. R. ....	Sept. 1915 ..	F., Wall Hall Gardens, Watford.
Bentall, A. S. ....	Oct. 1921.	
Benton, A. W. ....	May 1909 ..	86 York Road, Teddington, Middlesex.
Berg, F. ....	Feb. 1911 ..	Dien III. Aposthigasse 29-31, Vienna.
Berridge, T. G. ....	Aug. 1912 ..	5 Lansdowne Terrace, Day's Lane, Sidcup, Kent.
*Besant, J. W. ....	June 1905 ..	Keeper, Botanic Gardens, Glasnevin, Dublin.
Besant, W. D. ....	June 1910 ..	Asst. Dir., Parks and Gdns., City Chambers, Glasgow.
*Best, G. A. ....	Mar. 1921 ..	Asst. Curator, Bot. Gdns., Singapore.
*Biggs, E. M. ....	Oct. 1912 ..	Solent Court, Warsach, Hants.
*Binnington, R. ....	Oct. 1924 ..	72 Alfred St., Harpurhey, Manchester.
Bintner, Jean .....	Sept. 1917 ..	c/o Geo. Monro, Ltd., Continental Dept., 41-42 King St., W.C. 2.
Bintner, Mrs. Jean (Harper)	Jan. 1918 ..	3 Eastdown Park, Lewisham, S.E. 13.
Bird, D. H. ....	Jan. 1913 ..	Rosmede, Slough Rd., Datchet.
Bird, F. W. ....	May 1909 ..	6 King's Villas, Slough Rd., Datchet.
Birkinshaw, A. ....	April 1923 ..	Manchester Parks Dept.; and Boggart Hole Clough Park, Manchester.
*Birkinshaw, F. ....	April 1912 ..	Assist. Insp., Agric. Dept., F.M.S.
Bishop, Miss S. W. ....	April 1919 ..	10 Redcliffe Parade East, Bristol.
*Blackburn, A. ....	Oct. 1908 ..	Supt. of Parks, Blackpool.
Blake, A. E. ....	Sept. 1922 ..	2 Bryor Clyffe Cott., Corton Rd., Lowestoft.
Blancaneaux, J. S. ....	April 1878 ..	c/o E. J. F. Campbell, B.S., Belize, Brit. Honduras.
*Blanche, H. M. ....	Sept. 1909 ..	Chief Forester, Finger Lakes State Park Commission, Ithaca, N.Y., U.S.A.
Bliss, Daniel .....	Nov. 1895 ..	Supt., Public Parks, Swansea.
Bliss, J. ....	Aug. 1891.	
*Blythman, T. ....	May 1907 ..	Aldermere, B.C., Canada.
Boff, C. ....	Jan. 1916 ..	Link House, 54 Fetter Lane, E.C. 4.
*Bogemans, A. ....	Jan. 1911 ..	145, Avenue Van Becelacre Watermaelez-Brussels.
*Bogula, Otto .....	Mar. 1899 ..	F., Missouri B.G., St. Louis, Mo., U.S.A.
Bolt, Philip .....	Oct. 1874 ..	Whitegate Cott., Sutton Lane, Middlewich, Cheshire.
*Bolt, Philip (jun.) ....	June 1898 ..	H.G., Stand Hall, Whitefield, Manchester.
Bolton, W. ....	Feb. 1904 ..	Blenheim, Woodstock, Oxon.
Bond, William .....	June 1876 ..	H.G., 66 Bostall Lane, Abbey Wood Kent.
Booker, A. J. ....	Nov. 1924 ..	13 Claremont Rd., Alexandra Park Manchester,

<i>Name.</i>	<i>Left Kew.</i>	<i>Present Position and Address.</i>
Boorman, John . . . . .	Aug. 1885 ..	10 Hathern St., Leichhardt, Sydney, N.S.W.
Boswell, Miss D. A. L. . . . .	June 1918 ..	Brougham Terrace, Hartlepool.
Boulton, Francis . . . . .	Jan. 1915 ..	Imperial Institute, S. Kensington, S.W.7.
*Bowell, E. C. . . . .	Sept. 1906 ..	N., Alpine Cott., Cemetery Rd., Cheltenham.
Bradbury, James . . . . .	July 1880.	
*Braggins, S. W. McLeod . . . . .	Nov. 1906 ..	Supt., La Mortola, Ventimiglia, Italy.
Braid, Major K. W. . . . .	1925. . . . .	W. of Scotland Agric. College.
Brain, H. J. . . . .	Mar. 1915 ..	42 Bulstrode Avenue, Hounslow, Middlesex.
Braybon, E. A. . . . .	Mar. 1915 ..	Asst. Supt., Cinchona Cultivation, Mergui, Burma.
Brenchley, J. A. . . . .	Nov. 1882.	
Brierley, W. B., D.Sc., F.L.S. . . . .	Nov. 1918 ..	Research Inst. of Phytopathology, Rothamsted.
*Briscoe, T. W. . . . .	April 1905 ..	H.G., 4 Gloucester Rd., Tutshill, Chesham.
Broadbridge, Mrs. L. . . . .	Aug. 1918.	
Broadway, Walter E. . . . .	June 1888 ..	31 Cornelio St., Port of Spain, Trinidad.
*Brooks, A. J., F.L.S., F.C.S., J.P. . . . .	May 1903 ..	D., Dept. Agric., Gambia.
Broomer, Frederick . . . . .	April 1881.	
*Brown, A. E. . . . .	Sept. 1905 ..	Box 147, Mimico, Ontario, Canada.
*Brown, E., F.L.S. . . . .	Dec. 1903 ..	Hillside, Doddington, nr. Sittingbourne, Kent.
*Brown, J. . . . .	April 1905 ..	Gray Craig, R.F.D. 1, Newport, Rhode Is., U.S.A.
Brown, Jas. . . . .	Nov. 1926.	28 Tilton Street, Fulham, S.W. 6.
Brown, Nicholas E., A.L.S. . . . .	July 1914 ..	6 The Avenue, Kew Gardens.
Brown, Thomas . . . . .	Nov. 1884 ..	Parks Rd. Offices, City Hall, Winnipeg.
*Brown, T. W., F.L.S. . . . .	Nov. 1899 ..	9 Mountfield Gardens, Tunbridge Wells.
Brown, Wm. . . . .	Jan. 1926 ..	c/o Clarendon Turf Club, Ltd., Durban, Natal, South Africa.
Bruun, Svend . . . . .	June 1895 ..	N., Brøndbyvester Strand, Glostrup, Denmark.
Bruins-Lich, H. . . . .	July 1926 ..	The Gardens, La Mortola, Ventimiglia, Italy.
Bryan (Brien), H. . . . .	Mar. 1906 ..	Steward's House, Hampstead, Glasnevin, Co. Dublin.
Bryan (Brien), I. G. . . . .	Mar. 1878 ..	Hibernia, Palmerston, Fairfield, W. Australia.
Bryan (Brien), W. . . . .	Feb. 1878 ..	H. G., Mayfield Gdns., Portlaw, Co. Waterford.
*Bryant, Edwin . . . . .	Dec. 1889.	
Buckholz, V. . . . .	Mar. 1911 ..	Cottbus Camp, Germany.
Bullock, T. G. . . . .	May 1913 ..	Hort. Lect., 6 St. Martins, Leicester.
Burbridge, K. G. . . . .	Jan. 1906 ..	Cons. of For., Sierra Leone, W. Africa.
Burfoot, Charles . . . . .	Mar. 1921 ..	H.G., Bulmershe Ct., Earley, nr. Reading.
*Burkill, I.H., M.A., F.L.S. . . . .	Dec. 1900 ..	The Camp, Gt. Bookham, Surrey.
Burn, Thomas . . . . .	Jan. 1888 ..	Cuerdon Hall, Bamber Bridge, Preston.
*Burrell, L. C., M.B., M.A., B.C. . . . .	Mar. 1922 ..	Arlarie, Wansford, Peterborough.
*Burrell, Miss L. C. . . . .	Mar. 1922 ..	Arlarie, Wansford, Peterborough.
Burton, H. . . . .	Dec. 1903 ..	U.S.A.
*Buss, L. . . . .	Nov. 1924 ..	Fern Lea, The Avenue, Durham.
*Butcher, F. H. . . . .	May 1907 ..	C., Govt. Gdns., Ootacamund, India.
Butcher, G. W., J.P. . . . .	June 1912 ..	Green Cottage, Hartfield, Sussex.
Butcher, H. G. . . . .	Sept. 1921 ..	127 Diana St., Roath Park, Cardiff.
Butler, F. B. . . . .	Nov. 1919 ..	Supt. Dep. Agric., Kenya Colony, B.E. Africa.
Butler, P. J. . . . .	Feb. 1922 ..	Bedford College, Regent's Park, N.W.1.



<i>Name.</i>	<i>Left Kew.</i>	<i>Present Position and Address.</i>
*Butts, E. ....	Aug. 1882 ..	Leigham Villa, Leslie Rd., Rayleigh, Essex.
*Bysouth, Mrs. R. A. (Davies).	Jan. 1919 ..	Lashbarn P.O., Saskatchewan, Canada.
Cambridge, Robert ....	Nov. 1894 ..	Turnham's Farm, Calcot, Reading.
*Cameron, John, F.L.S. ....	Dec. 1873 ..	7 Hamlet Road, Upper Norwood, S.E. 19.
*Cameron, Robert .....	April 1887 ..	Est. Supt., Castle Hill Estate, Ipswich, Mass., U.S.A.
*Campbell, J. W., J.P. ..	May 1904 ..	Visiting Agent, Rub. Est., Malacca.
Campbell, W. M., N.D.H.	April 1924 ..	Birmingham University, Edgbaston.
*Candler, S. R. ....	Feb. 1913 ..	P.O. Box 278, Southampton, Long Island, N.Y., U.S.A.
Candler, Thomas H. ....	Mar. 1897 ..	H. G., 83 Elm Rd., Bournville.
Canning, J. ....	April 1891 ..	H. G., Lawn Tennis Club, Rue Lacour, Cannes.
Cannon, H. A. ....	Mar. 1912 ..	Uganda Coffee and Rubber Est., Ltd., Kampala P.O. 53, Uganda.
Capsticks, W. H. ....	Oct. 1912 ..	Strode, Ivy Bridge, South Devon.
*Cartwright, T. ....	May 1908 ..	Supt., Expermt. Pltns., Jebelin, Soudan.
Casey, Miss E. M. ....	Dec. 1917 ..	7 Gloucester Cres., Regent's Pk., N.W. 1.
*Casse, A. E. ....	Mar. 1900 ..	Bayeux, Hayti.
*Cavanagh, A. A. ....	Dec. 1923 ..	M., Liebig's Yerba Matè Plantations, Territorio de Misiones, Argentine Republic.
*Cavanagh, B. ....	Nov. 1899 ..	Nao Salao, Gwalior, Central India.
*Cave, George H., M.B.E.	Aug. 1896 ..	c/o India Office, S.W. 1.
*Cave, J. E. ....	April 1903 ..	H. G., Crix Cottage, Binfield, Berks.
Cessford, John .....	April 1880 ..	
Chambers, G. ....	April 1915 ..	Woodside, Llanfoist, nr. Abergavenny, Mon.
Chambers, Mrs. K. (Watson, K.).	Mar. 1922 ..	32 Valley Rd., Welwyn Garden City.
Champion, Miss. ....	Feb. 1916 ..	Ystrad, Denbigh, N. Wales.
*Chandler, P. ....	Nov. 1919 ..	Asst. Agric. Dept., Kampala Uganda.
Chapelow, A. U. ....	June 1895 ..	
*Chapman, H. L. R. ....	July 1919 ..	H.G., Botanic Garden, State College, East Lansing, Michigan, U.S.A.
Charman, George .....	Feb. 1885 ..	Florida.
Child, H. V. ....	Jan. 1911 ..	Kew Convent, Kew, Victoria, Australia.
Chinery, Philip .....	Nov. 1882 ..	H.G., Bulmer Lodge, Sudbury, Suffolk.
Chollet, P. ....	Oct. 1916 ..	c/o Messrs. Sander & Sons, Bruges.
Christensen, P. C. ....	Mar. 1901 ..	Nørregade 64, Odense, Denmark.
*Christie, J. S. ....	Nov. 1909 ..	Supt. Parks, Camberwell, 424 Lordship Lane, East Dulwich, S.E. 22.
Cishegg, J. ....	June 1908 ..	M., Stanmore Nurs., Stanmore, Middx.
Clacy, C. S. ....	April 1908 ..	Agates Meadow, Finchampstead, Berks.
Clark, John .....	Dec. 1900 ..	Spt., Cem. Lodge, Hatfield Rd., St. Albans.
Clark, Peter D. G. ....	Sept. 1880 ..	c/o Curator, Royal Bot. Gdns., Ceylon.
Clarke, G. ....		Billing Hall Gardens, Northampton.
Clarke, N. K. ....	Nov. 1909 ..	H. G., Orsett, Grays, Essex.
Clarke, T. E. ....	Jan. 1924 ..	Glasgow Parks Dept.
*Clegg, A. S. ....	Jan. 1921 ..	c/o Mr. E. Kaufman, Aspen Wall, Pittsburgh, Pa., U.S.A.
*Clements, T. ....	Dec. 1906 ..	H.G., Drewsteignton Rect., Newton Abbot
Close, A. W. ....	May 1908 ..	c/o U.S. Dept. Agric., Glen Dale, Maryland, U.S.A.
*Coates, Mrs. D. B. (Taylor).	Aug. 1916 ..	South Kilworth, Rugby.
Cocker, Aloysius .....	June 1872 ..	H. G., Stourton Castle, Knaresborough.
Cole, F. J. ....	Mar. 1901 ..	Landsc. Arch., Seattle, Brit. Columbia.
*Collin, H. ....	Nov. 1923 ..	2 Miller's Lane, The Cape, Warwick.

<i>Name.</i>	<i>Left Kew.</i>	<i>Present Position and Address.</i>
Collins, J. ....	Oct. 1910 ..	36 The Butts, Brentford.
Collins, W. ....	April 1919 ..	S., Clarence Park, St. Albans.
*Conn, P. W. ....	Oct. 1923 ..	Bedwelty Park, Tredegar, Mon.
Cook, F. J. ....	May 1921 ..	Asst. Gdnr., Nat. B. G., Kirstenbosch, S. Africa.
*Coombes, G. ....	July 1915 ..	c/o Tela Railroad Co., Tela, Honduras, C.A.
Cooper, Edward ....	Oct. 1894 ..	Sander & Sons, Nurserymen, St. Albans.
*Cooper, E. C. W. ....	May 1925 ..	67 Fairfield Road, Edmondton, N. 18.
Cooper, T. ....	Sept. 1914 ..	Birmingham Parks Dept.; and 92 Westminster Rd., Selly Park, Birmingham.
*Cope, Gertrude ....	Nov. 1898 ..	Pinewood Gardens, Chandler's Ford, Winchester.
Corbett, G. ....	May 1920 ..	Agric. Supt., Rodrigues.
Corbett, W. ....	Mar. 1925 ..	8 Willow Terrace, Windmill Lane, Cheshunt, Herts.
Corbishley, Miss A. G. ....	April 1921 ..	74 Ridge Road, S. Durban, S. Africa.
Cork, Henry ....	Mar. 1893 ..	H. G., Hampton Lodge, Seale, Farnham.
Cotton, Mrs. A. D. ....	Aug. 1915 ..	Herbarium House, Kew, Surrey.
Coudrey, Joseph ....	Mar. 1883.	
*Cousins, F. G. ....	May 1911 ..	Town Hall, Torquay.
Coutts, W. ....	Feb. 1903 ..	H.G., Learney, Torphins, Aberdeensh., N.B.
Coventry, T. ....	April 1924 ..	Manchester Parks Dept.; and 13 Claremont Rd., Alexandra Pk., Manchester.
Coward, E. ....	July 1923 ..	74 Dogfield Street, Cathays, Cardiff.
*Cowley, H. ....	Dec. 1907 ..	Editor, 'Gardening Illustrated'; and 18 Sutherland Rd., Tunbridge Wells.
Cox, Alfred ....	Feb. 1885 ..	M. G., Newbury, Berkshire.
*Coxon, W. E. ....	Aug. 1898 ..	Braemar Nurseries, West Worthing.
*Cradwick, William ....	July 1888 ..	Agric. Instr., Mandeville P.O., Jamaica.
Craib, Prof. William G., M.A., F.L.S.	July 1915 ..	Prof. of Bot., Univ. of Aberdeen.
*Craig, Mrs. A. P. ....	July 1920 ..	"Northbank," Hort. College, Swanley, Kent.
Creek, Ernest ....	Aug. 1901 ..	Hort. Inst., Shire Hall, Bury St. Edmunds.
Cressier, G. H. ....	May 1912 ..	9 Rue Vallier, Levallois Perret (Seine), France.
*Crosby, F. ....	Dec. 1901 ..	24 Lancaster Rd., Edmonton, N. 18.
Crot, W. ....	Mar. 1904.	
*Crouch, G. S. ....	Sept. 1913 ..	The Fairseat Nurseries, Wrotham, Kent.
Crowe, V. C. ....	Dec. 1919 ..	23 Gloucester Road, Kew, Surrey.
*Crump, Edward ....	Aug. 1871.	
*Culham, A. B. ....	June 1910 ..	Supt., Agric. Dept., Gold Coast.
Culver, D. R. ....	June 1922.	81 Lr. Mortlake Rd., Richmond, Surrey.
*Cundy, Charles ....	April 1881 ..	N., "The Elms," Gt. Cornard, Sudbury, Suffolk.
*Cunningham, W. J. M. ....	Oct. 1921 ..	Bai Rub. & Cocoa Ests., c/o Millerio Factory, Calabar.
Curtis, Charles H., J.P. ....	May 1892 ..	M. Ed., 'Gardeners' Chronicle'; and "Brentlea," 24 Boston Rd., Brentford, Middlesex.
*Dalgarno, Fred C. ....	Mar. 1902 ..	Park Supt., Bowes Mus., Barnard Castle.
Daubanton, C. ....	Mar. 1908.	
*Davidson, Miss H. W. ....	May 1919 ..	Gerrans, Bassett, Southampton.
Davidson, William ....	April 1896 ..	Monkhams Hall, Waltham Abbey.
Davies, Cecil ....	Jan. 1899 ..	D., Hammonton Hardy Plant Ny., Folsom, Atlantic City, N. J., U.S.A.
Davies, Miss G. A. ....		
*Davies, Henry J. ....	Jan. 1894 ..	Point House, Oakley Rd., Bromley Common, Kent.
Davies, Miss R. A. ....		See Mrs. Bysouth.

<i>Name</i>	<i>Left Kew.</i>	<i>Present Position and Address.</i>
Davies, T. P. ....	Oct. 1899 ..	H. G., Pen-myarth Pk., Crickhowell, S Wales.
Davies, W. ....	June 1912 ..	117 Maryvale Road, Bournville.
Davis, H. K. ....	Sept. 1909 ..	272 Sandycombe Road, Kew, Surrey.
*Davy, E. W. ....	Dec. 1905 ..	Asst. Dir., Dept. of Agric., Zomba, Nyasaland.
*Davy, J. Burt, Ph.D., F.R.G.S., F.L.S.	Sept. 1892 ..	Lecturer in Tropical Forest Botany, Imperial Forestry Institute, Oxford.
*Dawe, M. T., O.B.E., F.L.S.	Sept. 1902 ..	Commr. of Lands and Forests, Free Town, Sierra Leone.
*Dear, G. ....	Dec. 1922 ..	4 Church Walk, Upper Butts, Brentford, Middlesex.
Dearling, William .....	April 1891 ..	Sussex Farm, Oakey, Queensland.
Debot, M. ....	May 1903 ..	372 Chausse d'Helmet, Schaerbech, Brussels.
*Derry, Robert. ....	Nov. 1883 ..	14 Lion Gate Gdns., Richmond, Surrey.
Derwael, F. L. G. ....	June 1910 ..	Inspector of Public Gardens, Antwerp.
De Troyer, Ch. L. ....	Aug. 1904 ..	D., Grand Etablissement Horticole de Wolverthem lez Bruxelles, Belgium.
Dines, J. H. ....	Sept. 1908 ..	H. G., Downside, Leatherhead.
*Dinn, Theo. J. ....	Sept. 1901 ..	Marconistraat 84, The Hague, Holland.
Dixon, James. ....	April 1909 ..	c/o Messrs. Bees, Sealand Nurs., Chester.
Dixon, Matthew K. ....	Oct. 1877.	
Dixon, William. ....	May 1890.	
Dodd, E. S. ....	Jan. 1910 ..	c/o J. N. Seligman, Willow Brook, Irvington-on-Hudson, N.Y., U.S.A.
Dodd, W. G. ....	Mar. 1908 ..	Cherry Lane Cottage, Kimley, Dudley.
Dollman, Miss R. ....	June 1917 ..	Hove House, Bedford Park, Chiswick, London, W. 4.
Donaldson, R. H. ....	Dec. 1906 ..	P.O., Cannington, Western Australia.
*Down, W. J. ....	Sept. 1907 ..	H. G., 14 Hazelwood Av., Murryatville, Adelaide, S. Australia.
*Downer, H. E. ....	Mar. 1912 ..	H. G., Vassar Coll., Poughkeepsie, U.S.A.
*Downes, E. J. ....	Oct. 1920 ..	Horticulturist, Dept. Agric., Jamaica, B.W.I.
*Draper, Walter. ....	July 1892 ..	D., Govt. Gdns., Delta Barrage, Egypt.
*Drew, Miss D. E. ....	Mar. 1922 ..	51 Petty France, Buckingham Gate, S.W.
Drew, W. H. ....	Oct. 1875 ..	Penwartha House, Callestick R.S.O., Cornwall.
*Drost, Klaas. ....	Oct. 1880 ..	Oldebrook, Holland.
Drummond, R. A. ....	May 1926 ..	North of Scotland Agric. College, Aberdeen, N.B.
Dufton, L. ....	Aug. 1926 ..	c/o Kelways Ltd., Langport, Somerset.
*Duncan, J. G. ....	Mar. 1901 ..	Bot. Gdn., Port Elizabeth, S. Africa.
Dunk, W., D.C.M. ....	Sept. 1909 ..	1 Gainsborough Rd., Richmond, Surrey.
Duval, Raoul. ....	Oct. 1901 ..	Buisson Hocpin, Evreux (Eure), France.
*Dyer, Sir W. T. Thiselton-, K.C.M.G., C.I.E., F.L.S., etc.	Mar. 1906 ..	The Ferns, Witcombe, Glos.
*Dyson, William. ....	Jan. 1899.	
Eady, G. H. ....	June 1912 ..	Asst. Supt., Agric. Dept., Gold Coast.
Earle, Arthur J. ....	July 1891.	
*Eavis, Harry. ....	Mar. 1902 ..	H. G., Fir Cottage, Hazel Grove, Hindhead, Surrey.
Elder, John. ....	May 1902 ..	Chatlapore Tea Estate, Shamsbernager P.O., South Sylhet, India.
Ellings, William. ....	Oct. 1909 ..	c/o G. F. Baker, Esq., Tuxedo Park, N.Y., U.S.A.
*Elliot, J. A. ....	Nov. 1905 ..	Allynugger Tea Co., S. Sylhet, India.
*Ellis, Miss C. F. See Mrs. Somers.		
*Ellis, J. ....	Feb. 1915 ..	H. G., Smith College, Northampton, Mass., U.S.A.

<i>Name.</i>	<i>Left Kew.</i>	<i>Present Position and Address.</i>
Ellis, Robert .....	June 1885.	
Elsom, Fred. ....	Aug. 1886.	
*Endres, H. W. ....	May 1912 ..	c/o Westover Nursery Co., Clayton, St. Louis, Missouri, U.S.A.
Entwistle, T. ....	Mar. 1877 ..	33 Conran St., Harpurhey, Manchester.
Epps, H. W. ....	Jan. 1911 ..	Blunt House Gdns., Oxted, Surrey.
*Epps, Miss L. ....	April 1919 ..	7 Powis Gdns., Golders Green, N.W. 4.
Evans, Alfred E. ....	Oct. 1901 ..	"Devona," 520 Portland Rd., Hove W., Sussex.
Evans, F. J., F.L.S. ....	June 1903 ..	Supt. of Agriculture, S. Nigeria.
*Evans, W. N. ....	June 1914 ..	6 Victoria Av., Granville St., Hull.
Eves, J. W. ....	Mar. 1904 ..	14 Park Mount, Kirkstall, Leeds.
*Falconer, William .....	Feb. 1872 ..	S., Allegheny Cem., Pittsburg, Pa., U.S.A.
Farr, B. E. ....	Oct. 1923 ..	Bagot, Jersey, C.I.
Feltham, Edward .....	Dec. 1909 ..	Kingsley, Milldown Rd., Goring - on - Thames.
Ferguson, Bruce .....	Sept. 1886 ..	Australia.
Field, F. W. ....	May 1909.	
Finch, Mrs. E. G. (Ware- ham).	Aug. 1920 ..	c/o P.O., Fort Jameson, Rhodesia.
Finkelmann, Robert ....	Dec. 1888 ..	c/o H. Mette, Quedlinburg, Germany.
Fischer, Joseph .....	April 1902 ..	N., Monumentenstr. 29, Berlin, S.W.
*Fishlock, W. C. ....	Oct. 1900 ..	Assist. Supt., Agric. Dept., Gold Coast.
*Flack, Mrs. C. L. ....	Jan. 1919 ..	7A Justin Apartments, Fleet and Daly Streets, Winnipeg, Canada.
*Flippance, F. ....	July 1915 ..	Asst. C., B.G., Penang.
*Flossfeder, F. ....	May 1904 ..	School of Agric., Davis, Cal., U.S.A.
*Flowers, Alfred .....	June 1902 ..	Roseland, New Jersey, U.S.A.
Flynn, G. O. ....	Mar. 1924 ..	Cearleon Training College, Cearleon.
Forbes, George .....	Mar. 1873 ..	H. G., Regent's House, Berrylands, Sur- biton.
Foster, J. T. ....	Dec. 1908 ..	Australia.
*Fothergill, G. H. ....	Jan. 1921 ..	Asst. M., Cinchona Plantations, Munsong, Kalimpong, India.
Fowell, Edmund ... ..	May 1887 ..	H. G., Chiswick, Ocean St., Woolahra, Sydney, N.S.W.
Fowler, James M. ....	June 1886.	
*Fox, Walter .....	June 1879 ..	"The Little House," Buckingham Rd., Shoreham-by-Sea.
Frank, Henri .....	Sept. 1893 ..	D., B.G., Jaysinia, Samoens, Switzerland.
Frankland, Arthur ....	April 1897 ..	N., 46 King Cross, Halifax.
Franklin, Walter .....	Nov. 1926 ..	F., Botanic Gdns., Cambridge.
*Fraser, John, V.M.H., F.L.S.	May 1885 ..	355 Sandycombe Rd., Kew, Surrey.
Fraser, Thomas .....	May 1880 ..	Florist, Ealing Common Station, W. 5.
Freda, Miss A. B. ....	May 1919 ..	Box 214, Chester, Nova Scotia, Canada.
*Free, M. ....	Mar. 1912 ..	H. G., Brooklyn B. G., New York, U.S.A., and 1000 Washington Av., Brooklyn.
Freeman, J. ....	Oct. 1918 ..	18 Station Road, Preston Park, Brighton.
French, F. W. Prosser ..	June 1891 ..	Acct. & Compt., Gen. Dept., Somerset House, Strand, W.C. 2.
French, H. ....	Nov. 1894 ..	H. G., Moulton Grange, Pitsford, North- ampton.
Fry, W. G. ....	Sept. 1926 ..	University College, Reading, and 43 Addington Rd., Reading.
*Fyffe, R. ....	Mar. 1908 ..	Conservator of Forests, Forestry Dept., Entebbe, Uganda.
Gagge, A. P. ....	July 1903.	
Gagge, Mrs. A. P. (Smith)	July 1903.	
*Galt, Alexander S. ....	Sept. 1894 ..	Rutherglen, Lidgett Pk. Rd., Roundhay, Leeds.

<i>Name.</i>	<i>Left Kew.</i>	<i>Present Position and Address.</i>
*Wilson, E. H., V.M.H. M.A.	Jan. 1898 ..	Asst. D., Arn. Arb., Jamaica Plain, Mass. U.S.A.
Wiltshire, Miss N. ....	April 1919 ..	Merlindene, Longhope, Gloucester.
*Wiltshire, T. ....	July 1925 ..	Asst. Supt., Palace Gardens, Khartoum, Soudan.
*Witty, Henry. ....	May 1883 ..	Supt., Parks etc., Hull.
Wood, Harry. ....	April 1901 ..	H. G., Winter Gdns. Co., Blackpool.
*Wood, Mrs. H. P. (Madan)	June 1919 ..	Whitehouse, Vowchurch, Hereford.
*Wood, W. L. ....	Nov. 1909 ..	Sungei Jelai Estate, Bahau, Negri Sem- bilan, F.M.S.
Woodhouse, P. J. C. ....	May 1923 ..	c/o Botanic Gardens, Kelvinside, Glasgow.
Wright, J. W. ....	Mar. 1924 ..	Asst. Curator, Botanic Gardens, Dominica B.W.I.
Wright, W. N. ....	April 1900 ..	"Roseleigh," 96 Semilong Road, North- ampton.
Wuyts, O. F. V. ....	Aug. 1915 ..	14 Vieux Chemin de Bruxelles, Ledebeg (Gand), Belgium.
Wyatt, Frederick G. ....	Dec. 1892 ..	H. G., Lisle House, Bournemouth,
*Wylie, James. ....	Feb. 1882 ..	98 Davenport Road, Durban, Natal.
Wyness, Miss E. ....	July 1919 ..	8 Mackenzie Place, Old Aberdeen, N.B.
*Yashiroda, K. ....	May 1926 ..	Fuchisakimura, Shozugun, Kagawaken, Japan.
Yencken, Miss A.	<i>See Mrs. Troup.</i>	
*Yeo, Miss M. L. ....	Mar. 1917 ..	Imperial Bureau of Mycology, Kew, Surrey.
Yeoward, Daniel. ....	Aug. 1889 ..	Fiji.
Young, Edwin C. ....	Oct. 1895 ..	H. G., Postlip Hall, Winchcombe, Glos.
Young, John. ....	Feb. 1883 ..	4 Woodville Crescent, Ealing, W. 5.
Young, T. ....	Sept. 1922 ..	Cannon Hill Park, Birmingham.
*Young, William H. ....	Feb. 1890 ..	13 Temple Sheen Road, S.W. 14.
Yuill, E. ....	July 1915 ..	Dalton House, Park Av., Ventnor, I.O.W.