Notes RBG Edinb. 43(2): 313–334 (1986)

A SURVEY OF THE WORK OF THE ROYAL BOTANIC GARDEN EDINBURGH IN 1984

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GENERAL REVIEW

The year 1984, with its Orwellian overtones, had for the Royal Botanic Garden, none of the drama to be expected, but certainly had its difficulties. In spite of this the main activities continued satisfactorily, but often against a background of snags and irritations which it is sometimes difficult to keep in perspective. Thus a general lack of junior staff on the scientific and library side and a depleted cadre of gardeners and students has made the maintenance of standards difficult. All this can have a quite disproportionate effect on morale—especially after a period of several years of nearer optimum staffing. At the same time the system of maintenance of buildings and glasshouses has remained with Property Services Agency, not answerable to its clients except in the most general fashion. It is against this rather sombre background that the management of the Garden has been engaged in preparing for the hiving-off of the Garden under trustees in 1986, and perhaps not surprisingly has come to the conclusion that the organization may be much more effective given more control over the resources used to sustain it, but over which it has had unsatisfactory direct control.

It would present a wrong impression of the Garden's activities in any year to dwell overmuch on innovations in garden operations or completion of scientific works, the true perspective of the Garden's work must emphasize that the four gardens, the herbarium and the library are much more akin to 'heritage treasures' than to a purely scientific research institute. It follows that much more than half the resources are committed to maintaining the treasure and only a small part is left for research, innovation and education. Therefore to report on the state of maintenance is of paramount importance, especially as any slippage there can easily result in long term deterioration which in the end will prove costly to remedy.

Of the outstation gardens, Logan is in good heart, the new shelter-belt to the south-west is slowly becoming established, the buildings are all completed and the garden and tea-room came in for well-merited public praise. Benmore on the gardening side has reached a state of consolidation, the new access to the Massan plantings will enable the public to get there more easily, other minor paths are being built and the

reorganization of the *Rhododendron* collection continues. The staff are now well housed in the clocktower, but the re-roofing of the rest of the courtyard cannot start until early 1986. There is still undeveloped land at Benmore, but this would require more manpower to achieve and, even more importantly, to maintain. This year the building programme at Dawyck has been completed, the main central axis of the Garden on either side of the stream is now 'tamed', many other areas of weed have been cleared and the southwest windbreak is establishing successfully. The three staff houses are—at last—completed. At Inverleith the rhododendron replanting programme continued, the new Rock Garden to Pond stream is settling down and extensive replanting in both the Wild Garden and Rock Garden is rejuvenating the scene.

Two major engineering systems, the glasshouse control and the herbarium/library air conditioning, have at last been properly investigated and reported on—the first by an outside consultant brought in by RBG. Both are shown, what RBG long knew, to be defective and restoration has been planned for 1985 and 1986. The Gardens returned highly satisfactory visitor attendances: Logan—35195; Benmore—36072; Dawyck—3600; and Inverleith—721916, where the highest total on one day since the 1930s (12609) was recorded on Sunday 22 April 1984.

The maintenance of the library without cutting services has proved very difficult. An earlier staffing review could not be implemented because of severe number constraints at a time when other staffs in the organization were being reduced. The library did not suffer cuts then, but intolerable backlogs were building up. A later report recommended some betterment and is under implementation. Thereafter the situation will be kept under review.

So far as the taxonomic work is concerned the earlier remarks on conservation of treasures equally apply, as shortage of assistant staff is leading to insufficient curation. A new allocation of curatorial duties in the herbarium to give all scientists and assistants clear-cut responsibilities was prepared by the Curator and distributed to all staff involved. The implementation of these responsibilities should become a major concern of the recently established in-house Herbarium Advisory Group mentioned below. The research work continues, still regrettably without adequate assistance; the result is especially noticeable in our lack of culturing of fungi and of cytological research.

The organization of management and especially methods of discussing problems underwent significant change by the implementation of a new management structure. Each of the Garden's main activities, Research, Garden, Herbarium, Library, Education and Publications now has an Advisory Group of 5–6 members. Most middle and senior staff serve on at least one Group and representation is carefully balanced so far as possible. Each group is chaired by a senior PSO—the research group by the Assistant Keeper. The groups, which meet at least twice a year, report through their chairmen to the Management Group which meets at least four times a year. The system started in spring 1984 and will clearly serve as a most useful reporting system to the new Garden trustees.

For senior management 1984 has been a year of very considerable pressure with all the preparatory work and discussions for hiving-off the

Garden in April 1986. The very meagre office staff could not have undertaken the extra work, so Mr S. Rosie was allocated from Division C of DAFS to research the complex problems to be resolved in connection with the necessary legislation and liaise with the many agencies of government with which the Garden's relations will change. Plans have to be made to bring in-house almost all establishment and finance matters and to develop new relations with Property Services Agency.

Towards the end of the year management and accountancy consultants, Price Waterhouse, were appointed to advise on new systems of management and financial administration. This has all added greatly to the Secretary of the Garden's workload to such an extent that the post is now worryingly overloaded.

Taxonomic Research

SOUTH-WEST ASIA: FLORISTIC STUDIES

Close involvement with almost all the Floras and floristic studies being carried out in the region has continued. This has involved routine naming of specimens (mostly from Arabia), vetting manuscripts for *Flora of Pakistan*, continuing close links with the many facets of botanical activity in the Arabian peninsula, revisionary work in Arabian genera, much general correspondence, and further work on the Umbelliferae for *Flora Iranica*. A rewarding aspect of the last has been an SEM study of fruit hairs, and Miss Ritchie has prepared a series of plates for eventual publication.

Mr A. G. Miller continued work on *Heliotropium*, and an account of the genus in the Arabian peninsula was begun. He made two collecting trips to Arabia: a month in the spring to N Yemen with R. A. King, concentrating on botanically little known areas in the extreme south of the country; two months in the autumn to Oman with Mr M. Gallagher (Adviser at the Natural History Museum of Oman) at the invitation of the Ministry of National Heritage and Culture. The latter visit was particularly successful with several new areas being collected, including a visit by helicopter to Jebel Semhan in Dhofar.

The *Flora of Turkey* project will come to a successful completion later in 1985 and to celebrate this a symposium (2nd Plant Life of Southwest Asia Symposium) is to be held at the Garden in September. It will be a joint venture involving the RBG, the Botany Department of Edinburgh University, and the Royal Society of Edinburgh.

FLORA OF THAILAND

A meeting of the Editorial Board was held in Edinburgh for the first time during the week of 30 July–2 August. This was the sixth time in c.20 years that the Board, with members from Thailand, Denmark, Paris, Tokyo, Leiden and the UK, had assembled. Mr B. L. Burtt, closely involved with the project since its inception stood down from the Board; his replacement, Mr I. C. Hedge, will continue the RBG's ties with the Flora.

LÉVEILLÉ CATALOGUE

Part XVIII of the Catalogue was sent to press and contains the Coniferae and Gnetaceae. A start has been made on the Gramineae. There are no Léveillé types among the c.3000 Asiactic specimens, most of which have been determined by E. Hackel. Although many of his names are now outmoded, it should be a relatively easy task to bring them in line with modern concepts and nomenclature. Many duplicates have already been extracted from the grasses and will be distributed to Chinese and Japanese institutes.

ERICALES

Dr Chamberlain continued his studies on *Rhododendron* subgenus *Tsutsusi* (the 'Obtusum Azaleas'). This project has been delayed by the recent publication of a number of new species by Chinese authors.

Dr Argent continued his work on the taxonomy of tropical Ericaceae, especially *Rhododendron* sect. *Vireya*. An expedition at the beginning of the year to Trus Madi in Sabah filled several gaps in known distributions of these plants. He also visited Australia and New Zealand to lecture on rhododendrons.

BERBERIS

Dr Chamberlain completed a synopsis of *Berberis* sect. *Wallichianae* in collaboration with Mr C. M. Hu of the South China Institute of Botany. Research is continuing on the remaining Old World sections of the genus.

ORCHIDACEAE, ETC.

In addition to numerous routine enquiries and identifications, four articles (two of them with colleagues) and a note on the occurrence of *Orchis morio* in Scotland were completed by Mr Woods.

The arrival, in May, of Mr T. M. Reeve (Department of Primary Industry, Laiagam, Papua New Guinea) saw the commencement of the final preparation for the revision by Reeve & Woods of *Dendrobium* sect. *Oxyglossum*; this will go to press during 1985.

The potential of Mrs Mendum (Mary Bates) as a botanical artist and a biologist has been fully realised, not only with the completion of a series of excellent drawings for the *Dendrobium* account, but also with illustrations for papers in *The Plantsman* and the *Flora of Bhutan* and in her co-authorship of a short paper in *The Plantsman*.

Collaboration with Dr R. C. Warren (Edinburgh) has been continuing. Two examples are sufficient to demonstrate noteworthy successes from Warren's propagation techniques thus helping us to consolidate or ensure the cultivation of rare or botanically important species. For instance much of the research work on *Dendrobium* sect. *Oxyglossum* is based on the excellent living collection at RBG Edinburgh: one species, however, *Dendrobium laevifolium,* was represented only by a small plant received in a sickly state from G. F. Dennis, a Solomon Islands contact. Collaboration with G. C. Stocker, a contact in Australia, resulted in the gift of a flask of protocorms of this species. Dr Warren reflasked these and grew them on for us to transferable seedling size. The batch of seedlings received died as the result of snail damage. Fortunately, Warren

was able to replace these and the resulting plants now represent an important addition to the study collection. The second example is of the propagation of two New Guinea species of *Dendrobium*, *D. aberrans* and *D. atroviolaceum* which have been successfully bulked-up; the seedlings received from Warren have grown on and flowered in less than two years.

THE EUROPEAN GARDEN FLORA

Volume II of the Flora (the first to appear) was published in March 1984. Edited by Dr Cullen, Miss Matthews and numerous collaborators, it provides the means for the identification of 17 families, 402 genera and 1663 species of Monocotyledons. Of the 29 authors who contributed to the volume, seven were on the staff: Dr Argent, Dr Cullen, Miss Lamond, Miss Matthews, Dr Ratter, Miss Smith and Mr Woods. In addition, Dr J. C. M. Alexander (Wolfson Industrial Fellow; formerly funded by the Stanley Smith Horticultural Trust) has now spent five years at RBG as Research Associate on the project. Work is proceeding on the editing of volume I, which will be sent to press in March 1985.

During the year nearly 1000 plants from the Garden were identified or verified by Miss Matthews and colleagues. Special emphasis was placed on plants known to be threatened with extinction in the wild; 163 accessions of such plants were checked and the results notified to the Threatened Plants Committee of IUCN at Kew.

ZINGIBERACEAE

Miss R. M. Smith completed part I of her review of Bornean Zingiberaceae; this covers *Burbidgea*, *Plagiostachys*, *Alpinia*, *Hornstedtia* and *Amomum*. Part II (the remainder of the tribe Alpineae) should go to press in 1985. An account of the family for the *Flora of Southern Africa* has been prepared and several small collections identified.

BHUTAN FLORA PROJECT

Volume I Part 2 of the *Flora of Bhutan* was published in December. It includes 40 families and over 600 species, some belonging to taxonomically difficult groups such as *Delphinium*, *Aconitum*, *Corydalis*, *Piper*, Cruciferae and Lauraceae. Five hundred copies have been despatched to Bhutan as part of the 'Overseas Aid' agreement under which the project operates.

Draft accounts for Volume I Part 3 of the Flora were mostly completed, but those for the large families Leguminosae, Rosaceae and Euphorbiaceae require extensive revision. Several scientific papers were published during the year including treatments of E Himalayan Lauraceae and Fumariaceae.

D. G. Long and I. W. J. Sinclair undertook the fourth RBG expedition to Bhutan, this time a trekking trip to the mountains of NW Bhutan during September and October. Six weeks productive collecting resulted in around 950 herbarium collections, 130 accessions of living plants and 170 of seed; some forty taxa new to Bhutan were collected, including several undescribed species. Subsequently, most of the living material has survived and a large percentage of the seed proved viable. During the visit, improved co-operation with the Bhutan Forest Department was

established, and several other useful contacts were made, some of whom are now collecting plant material for the project.

During the year the project has enjoyed continuing support from the Overseas Development Administration, in particular A. W. Peers and his successor J. R. Goldsack, and from The British Council Division, Calcutta and Royal Government of Bhutan.

CONIFERS & PTERIDOPHYTES

The year's early activities were dominated by the editing of more than sixty papers arising from the International Symposium on Pteridophyte Biology, organized by Dr Page of the RBG and Dr Dyer of Edinburgh University Botany Department, and held jointly between the two institutes in September 1983.

The reinstatement of an assistant, Miss R. Hollands, to help with laboratory investigation, herbarium curation and routine identification of both conifers and pteridophytes has also begun to reduce the considerable backlog of preserved materials which had inevitably accumulated since the resignation of Mrs F. Bennell and the ensuing period of non-replacement. Live material cannot, however, be held up, and priority was given by Dr Page to continuing with outstation planning and planting with our accumulating, virtually unique, collection of wild-source conifer stocks. Close co-operation has been achieved in this with the horticultural staff concerned, particularly at Benmore and Dawyck, which are becoming the main conifer collections, and in the necessary propagation and growing-on work at Edinburgh. Endorsement by the Review Group for this work and for the continued establishment of several smaller collections of less hardy material in co-operation with the National Trust and various University authorities in the milder corners of Britain has gone a long way towards ensuring the continuing development of this work and the permanency of the collections so established.

Dr Page, together with PhD student Patrick Hadfield, visited New Caledonia and, briefly, New Zealand, from late October to early December. They undertook intensive fieldwork on the very large number of endemic conifers and pteridophytes present. The local co-operation, in New Caledonia of the French overseas research organization ORSTOM and of Mr Peter Lowry (Missouri Botanic Garden), and in New Zealand of the University of Auckland Botany Department and the Forestry Research Institute, Rotorua, made the whole period a most productive one, despite a revolution in New Caledonia at the time! The opportunity to include Mr Hadfield resulted largely from generous financial sponsorship from NERC and the Edinburgh Royal Botanic Garden Trust. In addition to large herbarium gatherings, material is now in propagation at Edinburgh of several rare, or hitherto uncultivated, conifers, including the genera *Acmopyle*, *Austrotaxus*, *Decussocarpus*, *Falcatifolium*, *Prumnopitys* and *Neocallitropsis*.

Co-operation with other bodies requiring a taxonomic input as part of research projects on conifers and pteridophytes has been growing steadily. Dr Page was involved in an external capacity, with the supervision of two conifer theses, which were successfully submitted to their respective universities during the year: on the identification of conifers from needle

fragments, as an honours thesis in the Department of Forensic Science, Strathclyde University (Miss M. Turner) and on Himalayan Conifer Ecology as an MSc thesis in the Department of Biological Sciences, Exeter University (Mr M. C. Burns). A second PhD student, Miss K. A. Ader, began work in September, continuing with the research on biology and spread of bracken in Scotland, begun by Mr P. Hadfield, who is now completing his PhD for the Botany Department, Edinburgh University. Miss Ader is working jointly between Dr Page and Professor J. Tivy of the Geography Department, Glasgow University, and will be part-resident at the RBG over the next three years. Grant-funding for both bracken students is from the Natural Environment Research Council.

BRYOPHYTES

The major curatorial reorganization of the bryophyte herbarium, begun in 1982, was completed by Mrs Rae. This involved the incorporation of specimens from the U. K. Duncan, J. B. Duncan and other herbaria, and a rearrangement of the British and Irish collections following the new Census Catalogue, including a geographical arrangement for each species. Exchange of duplicates with several overseas herbaria was increased.

A revision of Arctic Polytrichaceae for the *Moss Flora of Arctic America and Greenland* was completed by D. G. Long, and studies on Arabian bryophytes were continued with additional collections made during the year by A. G. Miller, R. A. King and resident collectors in Oman and Yemen. Field trips in Ireland and Scotland produced additional material, including new records of rare and local species poorly represented in the Herbarium.

BRAZILIAN FLORA STUDIES, CYTOLOGY, ETC.

Dr Ratter's research time was spent on the identification of the collection made in Brazil in 1983 and in a seven-week visit to Central Brazil from late July to September. Most of the visit to Brazil was spent in the Pantanal of Mato Grosso and Mato Grosso do Sul and during this time a one-week field course was given to students of the Federal University of Mato Grosso, Cuiabá. In Mato Grosso do Sul a study on the forests and cerrados (tree savannas) of Fazenda Nhumirim was carried out in collaboration with the staff of the Unidade de Execução de Pesquisa de Âmbito Estadual of the Empresa Brasileira de Pesquisa Agropecuária, Corumbá (an agricultural research organization funded by the Federal Government) and a report was prepared.

Ratter also contributed accounts of the tropical families Marantaceae and Cannaceae to the *European Garden Flora*.

As in previous years, virtually no cytological work was carried out because of lack of assistant staff.

BRITISH HERBARIUM

The Botany of the Lothians project made good progress and some indoor and outdoor workshops were held to explain procedures in recording the flora.

In the summer there were two surveys with the Nature Conservancy Council: on Beinn Dearg in West Ross, held jointly with the Botanical

Society of Edinburgh and resulting in several new bryophyte and lichen records; and on North and South Uist and Benbecula for fresh-water macrophytes. Several new sites were found for some rare species such as *Naias flexilis*.

The majority of specimens sent in for naming were connected with the Botany of the Lothians project.

BASIDIOMYCETES

Taxonomic studies on agarics (Dr Watling) particularly those in the family Bolbitiaceae and the genus *Armillaria* have continued; results from the examination of collections of the former from several non-temperate countries are at present being processed for eventual publication. Work is well underway with the next parts of the *British Fungus Flora: Agarics and Boleti,* Strophariaceae, and Coprinaceae p.p. with Mrs N. Gregory, and Pluteaceae with P. D. Orton (Honorary Associate); *Lactarius* is still being prepared by R. Rayner. Joint studies on the chemistry of *Cortinarius* with Strathclyde University, Forensic Science Department continue.

During April Dr Watling visited the United States to collect and lecture in several centres. A lecture was also delivered at the 2nd International Symposium on Arctic–Alpine Mycology held at Fetan, Switzerland during August. Courses on the identification of fungi have again been conducted at Sheffield University and at Kindrogan Field Centre, Perthshire, and reviews presented at the symposia on 'Resource relationship of agarics' and 'Developmental biology of agarics' organized by the British Mycological Society. These reviews and that on Scottish mountain fungi delivered at ISAM—II are now awaiting publication.

Mrs Gregory continues to work with Dr Watling for half her time, and A. Bennell completed with him an account of spore-wall architecture in the genus *Armillaria*.

P. D. Orton has completed a further part of his on-going revision of British agarics.

UREDINALES & USTILAGINALES

Mr Bennell's continuing studies of rust fungi included an investigation of the genus *Chrysomyxa* worldwide with emphasis on the species producing disease on *Rhododendron* in Britain, and a survey of the British clover rusts.

ASCOMYCETES & LICHENS

Dr Coppins has begun a revision of the Arthoniaceae (beginning with European taxa), and studies of extra-European *Micarea* and various British lichenized and non-lichenized fungi are continuing. Field studies included visits to NW Scotland, N Sutherland and Deeside, some in association with the Nature Conservancy Council. Dr Coppins led a field course on limestone lichens at Bristol University, and delivered a paper on *Micarea* at an ascomycete taxonomy meeting at Kew.

GENERAL MYCOLOGY & LABORATORY

Drs Watling and Coppins, and Mr Bennell continue to offer a fungus identification service and through the laboratory all have been involved in

advisory and/or survey work for wild-life trusts, and the Nature Conservancy Council and Institute of Terrestrial Ecology. Watling is at present involved in an updating of the agaric records in Stevenson's *Mycologia Scotica* as part of his Presidential activities in the Botanical Society of Edinburgh, during his term of office from 1984–1986. His studies on the fungi of Shetland continued during the 1984 season, and plans are already underway to prepare a species index for publication.

A comprehensive microphotographic facility and interference contrast option have been added to the light microscope equipment in the laboratory, and have already made valuable contributions to the work of RBG cryptogamic and phanerogamic botanists. The SEM unit continues to be heavily used by staff and their collaborators, for both research and educational purposes.

P. Hadfield (a joint CASE student with Edinburgh University Botany Department) has continued to use the laboratory for some of his PhD studies on *Pteridium* under the direction of Dr Page. From the Border Burghs Archaeological Project, B. Moffat continued his examination of botanical finds chiefly from the recently uncovered medieval village of Kelso, and W. Finlayson (jointly attached to Edinburgh University Archaeological Department) worked throughout the summer preparing anatomical reference slides of British woody plants.

A host guide to British rusts is being prepared by Prof. Henderson with assistance from Mr Bennell. In the spring Miss E. Kapsanaki-Gotsi from Athens worked in the laboratory with Mr Bennell and Prof. Henderson on her account of Cretan rusts; and Mr S. Helfer has continued his PhD studies on cereal rusts, jointly supervised by Dr Lennard (Edinburgh School of Agriculture).

With assistance from Miss Hollands, Mr Bennell conducted a survey of spore morphology in *Anthracoidea* (Ustilaginales).

THE HERBARIUM

ACCESSIONS, LOANS AND SPECIMENS MOUNTED

Incoming exchange accessions came from 20 different sources and amounted to 2604 specimens, including 383 from Cambridge, Massachusetts. Our 'distributions' were down from the previous year with specimens sent to only 7 institutes including Seoul (S Korea), the Makino Herbarium (Tokyo) and Helsinki.

Gifts from other institutes or people, and collections made by staff members numbered 3874 with the largest number coming from the Arabian peninsula. About 470 miscellaneous Iranian plants came from Prof. K. H. Rechinger (Vienna).

	1983	1984
Accessions*	11273	6983
Distributions	6008	1264
Loans: in	4430	4165
Loans: out	6239	8467
Specimens mounted	13029	14188

*These figures do not include gifts and accessions to the fungi, lichen and bryophyte collections (c.2000 specimens).

The bulk of the specimens mounted came from areas of special current interest: Arabia, Bhutan, Brazil and southern Africa. Smaller numbers were from Britain, China, SE Asia, Iran, Europe and N America.

PHOTOGRAPHIC SLIDE COLLECTION

Over 1000 slides were added to the collection. About half of these were donated by Mr A. Evans; this valuable material consists in the main of plants photographed in the wild in Europe and N America.

STAFF CHANGES

Miss Mary McLaren retired in October after 17 years service as a mounter. It is hoped to have a replacement for her in spring 1985.

VISITORS

Some of the longer term visitors in 1984 were Dr A. Alpinar (Istanbul), Dr H. Misirdali (Erzincan), Prof. O. Hilliard (Natal) and Mr T. Reeve (Papua New Guinea).

PhD students who regularly used the facilities of the herbarium or laboratory were: Mr P. Hadfield (Edinburgh), Mr J. Burley (Aberdeen), Mr A. Doroszenko (Edinburgh), Mr S. Helfer (Edinburgh) and Mrs N. El Husseiny (Cairo). Jahandar Shah (a joint Aberdeen University/RBG PhD student from Peshawar) successfully submitted his thesis on the taxonomy of *Swertia* in July.

The British Herbarium was much used and some of the more regular visitors were Mrs J. Clark, Dr C. Ferreira, Dr P. Macpherson, Miss H. Stace, Dr A. Silverside, Mrs O. M. Stewart, Mr A. McG. Stirling and Miss M. McCallum Webster.

Prof. P. Davis and his SERC funded Flora of Turkey team of Drs Kit Tan and R. Mill were, as in past years, virtually members of the herbarium staff; as were the retired (in name only) Messrs Burtt, Davidian and Lauener.

The regular visits of University biology and botany students continued as in previous years, as did visits from other professional groups.

Some other visitors:

Prof. S. I. Ali (Karachi), Susyn Andrews (Kew), Mrs V. Armer (Kuwait), Prof. M. A. G. Barros (Brasilia), Prof. S. S. Bir (Patiala, India), Dr W. E. Boyd (Glasgow), Mr C. Chadwell (Slough), Dr John Clarke (at Oman), Mrs Sheila Collenette (Hants), Prof. Chris Cook (Zürich), Mr W. Eddie (Reading), Dr D. Ferguson (Antwerp), Mr L. Forman (Kew), Prof. W. Frey (Berlin), Dr R. Geesink (Leiden), Prof. H. Geiger (Stuttgart), Dr J. Grainger (Jeddah), Mr P. Green (Kew), Dr B. Hansen (Copenhagen), Miss D. Hillcoat (British Museum), Dr Huang (Taiwan), Prof. K. Iwatsuki (Tokyo), Dr S. Jacobs (Australian Liaison Officer at Kew), Mr M. Johnson (Göteborg), Dr P. Kessler (Hamburg), Mr J. Koach (Tel-Aviv), Dr I. Kukkonen (Helsinki), Dr H. Kürschner (Berlin), Dr Ladizinsky (Israel), Prof. C. Lamoureux (Hawaii), Prof. Kai Larsen (Aarhus), Mr T. C. Liew (Sandakan, Sabah), Prof. R. Monteiro (Rio Claro, Brazil), Dr J. K. Morton (Ottawa), Mrs J. Palmberg-Gotthara (Uppsala), Dr J. Parnell (Dublin), Mr Chamlong Phengklai (Bangkok), Prof. J. B. Phipps (Ontario), Dr C. Preston (Monkswood), Dr H. S. Puri (Lucknow), Mr Mohammed Rejdali (Rabat), Mr Salleh (at Aberdeen), Dr Thawatchai Santisuk (Bangkok), Prof. Puangpen Sirirugsa (Prince of Songkla Univ., Thailand), Dr Laurence E. Skog (Smithsonian Institution), Prof. Tem Smitinand (Bangkok), Mr C. Sperling and Dr S. Spongberg (Arnold Arboretum), Prof. N. Taroda (Campinas, Brazil), Prof. Sally Taylor (Connecticut), Dr R.

Tryon (Harvard Univ.), Dr J. L. Ubera (Cordoba, Spain), Dr P. Uotila (Helsinki), Dr B. Valder (Seville), Dr J. Vidal (Paris), Prof. E. Dominguez Vilches (Cordoba Univ., Spain), Mr R. A. Western (Abu Dhabi).

THE LIBRARY

The backlog of work in the library continued to give cause for concern. Moreover the shelf space available often becomes filled necessitating time consuming movement of stock. The staffing was inspected and reported on by inspectors from Scottish Office. They backed the earlier report of 1976 where staff increases were impossible because of other severe cuts in the Garden's staffing. There is now agreement to implement modest staffing increases at temporary CA and Assistant Librarian levels. The adequacy of the increases will be carefully watched. The library advisory group—similar to others in the Garden—has met several times. It is chaired by the librarian Mr Matthew who reports to the overall Management Group.

Towards the end of the year the fall in the value of the pound sterling necessitated deferring some purchases. Despite this, by the end of the financial year the library vote could be marginally overspent.

The general library statistics for 1984 (with figures for 1983 in parentheses) are: acquisitions 3467 (2326), indexing 3522 (2911), exchanges 1073 (1063), interlibrary loans 650 (686), binding 1503 (1061) and visitors 782 (894).

PUBLIC EDUCATION & EXHIBITIONS

The major exhibition completed for the Exhibition Hall during 1984 was an introduction to the plant kingdom and looked at the group both taxonomically and biologically. Temporary and topical exhibits were mounted during the year on diverse subjects such as Dutch elm disease, the liverworts and the European Garden Flora. First experiments in the production of educational videotapes were made, and successful tapes on setting up a microscope, how to name plants using keys, soil analysis, and calibration of herbicide sprayers are now in use for teaching; the last two being made in conjunction with the Horticultural Training Section.

A total of 1413 pupils from 52 schools took part in the 1984 Interlink programme. The subjects were 'Homes and Habitats'; 'Food and Feeding'; 'Evolution' and 'Going, Going, Gone ...' (the last featuring habitat and species destruction).

In October the Garden together with the World Wildlife Fund organized a one day workshop for 5th and 6th form students on 'Plants and People'. A one day event 'Bringing them back Alive' was attended by 250 members of the public and featured members of the horticultural and scientific staff talking about recent plant collecting expeditions. Lectures and tours were given to groups from schools, colleges and universities including a group from the Smithsonian Institution, Washington.

Television and radio continued to call on our time. Scientific use included sequences for the BBC Natural History Unit's 'Natural World' and on the lighter side STV filmed Sir Harry Secombe and guests singing in the Garden for the 'Highway' series.

WEA courses continue to be taught in the evenings by RBG staff. The classes were 'The Living Planet' in spring and 'Plant and Planet' in autumn.

The latter part of 1984 was dominated by ideas for and negotiations over Inverleith House which is to become an exhibition space for the Garden in 1985/86.

A successful experiment in taking on a student from the Middlesex Polytechnic graphic design course for 12 weeks 'in service' training, followed by us accepting a second student to work in conjunction with the Exhibition Hall.

In conjunction with the Edinburgh College of Art, a course on botanical illustration was begun, as an experiment, in October 1983; with E. V. Blackadder (ECA) and Dr Burbidge as tutors. The success of the course has led to it becoming a 2nd year option on the Art College syllabus.

PUBLICATIONS

Only two parts of *Notes RBG Edinb.* were published during 1984 because of problems with printers: vol. 41(3):401–624 and 42(1):1–169. These contained a total of 30 papers and 2 book reviews. Material for two other parts of the *Notes* was sent to press.

PUBLICATIONS BY MEMBERS OF STAFF IN 1984

ARGENT, G. C. G. & BRUNTON, D. Some chromosome numbers in Ericaceae. *Notes RBG Edinb.* 41:561–564.

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*Although published in 1983, these were not included in the Survey for that year.

THE GARDEN, EDINBURGH

Total admissions to the Edinburgh Garden were 721916—an increase of nearly 77000 on the 1983 figure.

ARBORETUM DEPARTMENT (Mr G. Broadley)

During the spring, autumn and winter months work on the reorganization of the hymenanthes rhododendrons continued in the Copse. Towards the end of the year most of the larger plants in the subsections *Fortunea* and *Glischra* had been moved in. The subsect. *Pontica* was completed in the spring. The final stage will involve the siting of subsect. *Neriiflora*, which should be largely complete by the end of April 1985.

Throughout the year other areas of the Arboretum were cleared of unwanted trees and shrubs, consisting mainly of poor specimens and duplicates. Approximately 500 plants were removed. The Clematis Border and Chinese Borders were almost completely cleared, and will be sown down and utilized for shelter planting in the future.

A large section of the Beech hedge, which was serving no useful purpose, was removed from the West end.

In the middle of the year contractors employed by PSA demolished the old West toilet and West Gate kiosk.

New concrete storage bays for waste material were constructed at the north end of the Temperate Palm House.

The Conifer Walk was resurfaced and the perimeter railings along Arboretum Road were clad with wire mesh to prevent litter blowing into the Garden.

In the spring a large area of the turf nursery in the Experimental Ground was re-sown.

Throughout the year because of the relatively dry weather, watering of the rhododendrons was almost continuous, but there were no other weather problems during the period except for minor gale damage.

GLASS DEPARTMENT (Mr L. Buchan)

The Department has still been experiencing heating and ventilation faults especially in House 3. Heating valves have been replaced to stop heat backing up when all valves are closed during the summer months. Scaffolding had to be erected in many houses to repair ventilator faults.

The Aquarium remains closed to the public owing to staffing problems. In the Temperate Palm House a large collection of rhododendrons

belonging to subsect. *Maddenia* has been planted out, thus providing an injection of colour in the early part of the year in this house.

The paved area in front of the display houses has been altered to line up with the steps at the east end of the buildings and allow better access and more seating area.

In the orchid service houses rare orchid material from New Guinea, mainly in the genus *Dendrobium*, has been in flower and made a first class show. *Vanilla imperialis* has again flowered and produced seed pods but on a different plant from that reported in 1983.

This year the Glass Department decorated for special functions, the Royal Scottish Academy, the Royal Highland Show (DAFS Building), the PSA Building Exhibition held for one month in the Old Herbarium, and an exhibition for the Royal Caledonian Horticultural Society for their 175th anniversary.

Visits were made to the Glass Department by: Prof. Torrey of Harvard University, interested in *Agathis* roots; Dr Leakey, involved in 'Tropical Tree Improvement'; Mr G. Duncan and Mr E. van Jaarved, horticultural staff from the National Botanic Garden, Kirstenbosch in South Africa; and Mr K. Oestreicher from Stockholm University.

HERBACIOUS AND ALPINE DEPARTMENT (Mr A. Evans)

A new feature, a water course to link the rock garden stream to the pond was constructed well ahead of schedule. The surrounding disturbed ground was cultivated and planted in good time so that visitors to the Garden were able to enjoy this novelty in 1984.

A face-lift was started at the south side of the rock garden. This involved the removal of many rocks and the levelling out of an extensive area with a view to turfing over and so assist with maintenance. The area should be settled and completed by late spring 1985.

Both the south and north ends of the Heather Garden were revamped as they included old shrubs and exhausted soil. After cultivation of the soil some young heaths were used to fill the spaces.

Two areas of the Rhododendron Walk were completely gutted of old, unwanted plants and, after improving the soil and turfing over areas now not required, the beds were replanted in keeping with others nearby.

Large areas of turf in the Demonstration Garden were lifted and the ground levelled before the grass was relaid. This was necessary because of the damage made to the edges when the road was being re-surfaced.

The border at the west end of the Rose Garden was cleared of surplus plants and supporting wires were attached to the wall. After improving the soil, by adding compost and deep digging, a number of rose species were planted. Some were free standing while others were trained to the wires.

PROPAGATION DEPARTMENT (Mr J. A. R. Kerby)

Temperate Section. Work continued with the propagation of plants for the Garden departments, Benmore, Logan and Dawyck as requested. Much of the new wild source material came in via expeditions.

Cuttings of *Acer henryii*, from an old established tree in the Garden in poor health, were successfully rooted in a closed case with bottom heat;

epicormic softwood shoots from the main stem were used. Cuttings of *Tetracentron sinense* collected by Grierson & Long in Bhutan in 1982, placed in a mist unit in August, also rooted successfully.

Nursery. A wire rope under-soil-heating system was installed in one of the cold Hartley glasshouses. In the severe 1981/82 winter much damage was done to nursery stock when, even under glass, pots were frozen for six weeks and plants such as *Griselinia littoralis* and *Quercus ilex* were killed. The heating cable was covered with sand on the benches and set to provide a temperature of 1·5°C (35°F). This cool temperature regime is just above freezing and suitable for plants of borderline hardiness, mainly destined for Logan.

Tropical and Study Section. Internal retractable motorized blinds were installed in a number of glasshouses. They are fitted parallel to the roof-line and 150mm (6″) below it so that the houses can still be used for tall plants. When retracted the blinds cast little shade during critical periods of low light intensity.

In the latter part of the year, considerable time was spent reorganizing plant collections, due mainly to the input of succulents from Saudi Arabia. All our Malesian rhododendrons and tender Ericaceae have been grouped in one glasshouse, releasing space elsewhere to provide a less humid environment for succulents. Plants tolerant of similar regimes, such as bulbs and South African plants, have been grouped with the succulents.

Much effort in this section goes towards the cultivation of plant introductions from abroad passing through the quarantine section. Despite three staff resignations in the second half of the year and subsequent delay in recruitment, a considerable amount of work was accomplished.

Notable Plants. The small yellow-flowered *Rhododendron lineare*, collected by Dr Argent and Mr I. W. J. Sinclair on Gunong Buri (Sarawak) flowered, probably for the first time in cultivation.

Orthaea apophysata, a member of the Ericaceae from Trinidad, produced its red tubular flowers for the first time, despite having been in the Garden since 1974.

The orange-flowered *Streptocarpus dunnii* from the Transvaal previously maintained in pots, grew better and flowered well in a peat bed under glass. These large, single-leaved *Streptocarpus* can be difficult when container grown.

Six established plants of *Xanthorrhoea australis* (Liliaceae), commonly called 'Black Boy' or 'Grass Tree', from Australia were donated to the Garden from the Australian exhibit at the end of the Liverpool Garden Festival in October. One of these bore a substantial flower spike which opened before Christmas. This species has been raised from seed in Edinburgh before, but plants take many years to reach flowering size and this is probably the first time one has flowered in Britain.

Over the last few years we have been attempting to fill gaps in our plant collections with plant families either poorly or not represented. Plants of *Fouqueria diquetii* and *Idria columnaris* in the Fouqueriaceae from Mexico have been raised. These deciduous desert plants drop their

leaves leaving a spine. Young plants of *Stegnosperma halimifolium* in the Stegnospermataceae have also been raised. Plants of *Reinwardtia tigyna*, an unusual woody member of the Linaceae from North India, have reached flowering size.

Accessions. Accessions of living plant material in the form of seeds, cuttings and plants totalled 2853, of which 2502 were of wild origin.

Early in the year we received seed collected on the Swedish expedition to Pakistan in October 1983. Of particular interest were a number of fresh introductions of *Paraquilegia grandiflora.*

Mr B. Unwin, Garden Supervisor at Logan, while visiting the Canary Islands in January collected seed of a number of plants including the threatened plant *Siderites candicans.*

In February, Mr G. Kirkpatrick visited New Zealand, and despite being on holiday collected several interesting plants including wild origin *Griselinia littoralis* and *Nothofagus menziesii.*

There were further introductions throughout the year of mainly succulent plants from the Sultanate of Oman, Saudi Arabia and the Yemen Arab Republic. These plants from various sources support the Flora of Arabia studies being carried out by Mr A. G. Miller.

As part of the Flora of Bhutan project, Mr I. W. J. Sinclair and Mr D. Long made an expedition to Bhutan in September and October. Their accessions totalled 334 including two new species of *Gentiana.* Further collections of *Pinus bhutanica* and *Tetracentron sinense* were made. Other plants of particular note were *Nardostachys jatamansii, Talauma hodgsonii,* and an unusual member of the Hamamelidaceae, *Exbucklandia populnea.*

During a visit to New Caledonia and North Island, New Zealand, Dr C. N. Page collected material of conifers and pteridophytes, including cuttings of *Neocallitropsis parcheri* from New Caledonia.

Plants of the endangered 'Jellyfish Tree', *Medusagyne oppositifolia,* from the Seychelles were received from the University of Bern. Very few plants exist in the wild of this monotypic genus in the Medusagynaceae.

Dispatches. Live plant material within Britain and overseas:

271	seeds
2476	plants
406	cuttings
123	scions
20	specimens
3296	

PLANT HEALTH (Dr Watling)

1984 was quieter as regards plant quarantine than previous years. However, of the several pests recorded, scale insects have been intercepted on Asclepiadaceae (incl. *Caralluma* from Yemen), *Adelges* on *Pinus wallichiana* and *Tsuga dumosa* from Bhutan and the aphid *Pentolonia* on Zingiberaceae. *Pinaspis aspidistrae* has caused some concern with newly introduced ferns but as it is already known on *Dichorisandra physiflora* on the premises it is very probably a local infestation. Watling has prepared an account on the mildews of *Rhododendron* spp. found in Edinburgh.

YOUNGER BOTANIC GARDEN
(Mr A. Hall)

The Courtyard Building was designated a Grade 'C' Listed Building by the Historic Buildings Council. Work on rehabilitation of the Courtyard continued with the pointing of the Clocktower and its environs and with the installation of the original clockworks (dating from 1875) but with electric drive and chimes. Scaffolding was erected to support exposed gables on the remainder of the building until such time as the roof members are replaced. The North Lodge was fitted out as an Outstation Laboratory for use by visiting workers. Severe gales in January tore the roof from the garage, mower shed and stores and also twisted the framework of the cold greenhouse; neither building had been reinstated by the end of 1984. The final stage of the Glen Massan Road was constructed.

Approximately 550 specimens were planted out in the collections during the year. Garden staff constructed a link road between Benmore Hill Road and the Lower Hill Road to give access to an area which was then cleared to form an extension to the Barbata subsection of the rhododendron collection. Woodchips were laid down as a mulch under some parts of the rhododendron collection in order to suppress grass and mosses and to cut down on labour intensive maintenance. One gardener resigned in January and three were appointed in March to bring the complement back to normal.

Rainfall for the year was 2122mm. Highest maximum temperature 26·8°C; lowest minimum −10·1°C; lowest grass minimum −16·5°C.

Attendance figures from April to October were 36072; no significant change from 1973.

LOGAN BOTANIC GARDEN
(Mr J. M. Colledge)

Woodlands. The policy of removing old trees and replanting with the hardwoods *Pittosporum tenuifolium* and *Griselinia littoralis* continues. In January a gale in excess of 90 knots swept through the Garden uprooting several old and diseased trees and destroyed part of the pine woods. The eastern shelter belt of pines was thinned in accordance with routine maintenance. Three woodland ponds were filled in and a fourth made water-tight by lining it with 'Butyl' sheeting. These modifications to reduce natural seepage will help to provide a more efficient supply of water to the remaining pond. A road was constructed through part of the Woodland Garden to give vehicular access to the Deer Hill plantation.

Walled Garden. The most spectacular sight in 1984 was 108 specimens of *Echium pininana* (Boraginaceae; Canary Isles) in full flower. Also of interest was the shrub *Sclerochiton odoratissimus* (Hilliard 4784; Acanthaceae; S Africa) which having survived two winters in the open ground, flowered in late summer this year. A small collection of *Hedychium*, most of known wild origin, has been established.

Plant Collection. In January Mr B. Unwin joined an expedition to Tenerife led by Dr J. Dickson of Glasgow University. Considerable time

was spent at about 6000ft in the Los Cañadas region of Mt Teide and one day in *Laurus azorica* and *Erica arborea* forests on the island of Gomera. Of the 35 taxa collected, as seed, 24 have germinated so far including *Echium wildpretii* and the unusual *Marcetella monquiniana* (Rosaceae) with pendulous wind pollinated flowers and elm-like fruits.

Glasshouse. During the year, in a most protracted and inefficient way, an extra glasshouse was erected. It will provide more much needed space in which to overwinter half-hardy stock.

There were no staff changes in 1984 and during the year the staff continued to maintain a high standard of workmanship.

Rainfall (925mm) was below average and visitors numbering 39195 showed a slight increase over attendance in 1983.

Dawyck Arboretum
(Mr G. Broadley)

In the winter months clearing work continued, mainly in the Policy Bank area where more *Rhododendron ponticum*, old hollies, dying conifers and other trees were removed. The area in front of the new service building was levelled and sown in the spring. Several large trees and shrubs were also planted in the area. Twenty-one 7–8ft tall Irish Yews were planted in a half square to the west of the Chapel so as to clearly define the Chapel and graveyard from the surrounding area.

On the west side of the Garden three large elms suffering from 'Dutch Elm Disease' were removed. Over the whole arboretum approximately 180 young trees and shrubs were planted. In the autumn the line of six large limes immediately in front of the Service Building were removed. Also at this time, several large trees to the west of the car park were felled and the old tool shed and caravan were removed from the site.

During the year, PSA contractors carried out extensive patching on the driveway and began repairs and improvements on the perimeter deer fence. Problems were experienced throughout the year with the purity of the water supply, causing much inconvenience to staff.

In August, work was started on the last two staff cottages. They were scheduled for completion in December 1984 but owing to delays, completion is now expected some time in April 1985.

The weather was rather dry throughout creating watering problems with the new plantings. High winds blew down several old trees, two of them causing severe damage to the deer fence.

Horticultural Training Section

The Section continues under the full-time management of Mr G. Anderson and Mr D. A. H. Rae.

The annual presentation of awards to students was made by Mr Loudon P. Hamilton, the newly appointed Secretary of DAFS, on 5 July. Twelve students were awarded Diplomas (1 with Honours and 9 with Credit). All students had gained employment by November 1984, with posts in teaching/training attracting the highest numbers (5). Three found

employment in the British amenity sector with two entering into careers in landscape/planning and two joining commercial firms.

The Section's involvement with external examination boards continued. Mr Anderson was appointed as an external assessor for SCOTEC National Certificate examinations and as an examiner for the new M.Hort. Stage I examinations.

The Section's participation in Degree and Post-Graduate landscape teaching in association with Edinburgh and Heriot-Watt Universities continued.

The number of enquiries seeking advice on horticultural careers and courses remained at a level similar to the previous year whereas the number of applications (c.120) for entry to the 1984–87 Diploma Course was slightly down.

Annual Rainfall

Edinburgh	663·3mm (26in)
Benmore	2122mm (83·5in)
Logan	925mm (36·4in)

Staff List
(December 1984)

DA, Dawyck Arboretum; LBG, Logan Botanic Garden; YBG, Younger Botanic Garden.

Regius Keeper	Professor D. M. Henderson	
Personal Secretary	Mrs C. M. Marr	
Assistant Keeper	Dr J. Cullen	
Principal Scientific Officers	Mr G. Anderson	Mr I. C. Hedge
	Dr G. C. G. Argent	Mr D. G. Long
	Dr R. B. Burbridge	Dr C. N. Page
	Dr D. F. Chamberlain	Dr J. A. Ratter
	Mr A. J. C. Grierson	Dr R. Watling
Senior Scientific Officers	Mr A. P. Bennell	Mr A. G. Miller
	Dr B. J. Coppins	Miss R. M. Smith
	Miss V. A. Matthews	
Higher Scientific Officers	Mr R. Eudall	Mr D. A. H. Rae
	Mrs N. M. Gregory	Mrs J. M. Woods (neé Lamond)
	Miss R. King	Mr P. J. B. Woods
	Mr D. R. McKean	
Scientific Officers	Mr K. N. Grant	
	Miss E. H. Hamlet	Miss M. A. H. Paul
	Mrs H. Hoy	Mrs D. M. Radcliffe
		Mrs S. J. Rae
Assistant Scientific Officers	Ms D. Brunton	
	Miss R. C. Hollands	Miss A. M. McRitchie
		Miss J. Nyberg
Laboratory Attendants	Miss M. Bryce	
	Miss R. M. Calder	
	Mrs E. A. McAllan	

Curator	Mr R. L. Shaw	
Assistant Curators	Mr G. Broadley	Mr A. Evans
	Mr L. Buchan	Mr A. Hall (YBG)
	Mr J. M. Colledge (LBG)	Mr R. Kerby
Garden Supervisors	Mr D. Binns (DA)	Mr J. Sandham
	Mr N. Claughan	Mr I. W. Sinclair
	Mr R. U. Cranston	Mr W. Tait
	Mr G. Kirkpatrick	Mr B. Unwin (LBG)
	Mr G. Knott	Mr M. Welsh (YBG)
	Mr R. J. D. McBeath	
Librarian	Mr M. V. Mathew	
Assistant Librarian	Mrs D. A. Morrison	
Higher Executive Officer	Mr J. Sinclair	
Executive Officer	Miss J. R. S. Renwick	
Clerical Officers	Mr J. Welsh	Mrs R. Bell
Clerical Assistants	Miss V. Colgan	Mrs M. O'Brien
	Mr M. Delaney	Miss E. Rowan
Senior Paperkeeper	Mr W. Nicholson	
Sergeant Park-Keeper	Mr J. Y. Thomson	
Corporal Park-Keeper	Mr A. W. Brown	
Park Constables	Mr W. S. Connachar	Mr W. Murray
	Mr M. E. Fitz	Mr T. A. Nisbet
	Mr P. N. Fletcher	Mr W. B. Scott
	Mr D. C. Hogg	
Gardeners Special	Mr J. Fernie	Mr G. Murdoch
	Mr G. Godbert (YBG)	Mr A. J. Paxton
	Mr G. W. Lawson	Mr I. M. Potts (YBG)
	Mr J. McCluskey (YBG)	Mr J. Stewart
	Mr S. Macpherson	Mr E. E. Young
Gardeners I	Mr R. J. Allan	Mr W. M. Milne (DA)
	Mr S. M. Boyd (LBG)	Mr H. W. Paxton
	Mr A. J. Dunn (DA)	Mr R. M. Robertson
	Miss M. Harland	Mr J. P. W. Smith
	Miss J. M. Knott	Mr G. O. Taaffe
	Mr N. McIntyre (YBG)	Mr C. Thompson (YBG)
	Miss E. A. Mackintosh	Mr J. Urquhart
Gardeners II	Miss G. Anderson	Mr K. Little
	Mr N. T. Carrington	Mr A. B. Sinclair
	Mr M. A. Dickson	Mr J. Smith
	Mr S. Downie	Mr R. F. Stewart
	Mr H. Geddes (LBG)	Mr E. D. Traynor (YBG)
	Mr S. Hardman	Mr G. Watson

Assistant Gardeners	Mr S. J. D. Ainslie	Mr J. M. Mitchell
	Mr M. D. Cassidy	Mr R. Russell
	Mr E. Duff	Mr J. Sheriff (YBG)
	Mr N. A. Horsfield	Mr W. D. Walsh (YBG)
	Mr A. Mayes	Mr R. A. Wood
Engraver	Miss M. Laing	
Storeman	Mr J. F. Mayes	
Driver	Mrs M. Boyd	
Female Lavatory Attendants	Mrs W. Connacher	Mrs C. Horner
	Mrs S. J. Dunn (DA)	
Male Lavatory Attendants	Mr L. J. Kelly	Mr G. Clegg
Cleaner/Handyman	Mr P. McCormick	
Nightwatchmen	Mr J. Brady	Mr J. McKenzie
	Mr J. Duffy	Mr E. McCarthy
Students		
Third Year	Mr Q. J. Allardice	Mr D. S. Paterson
	Mr A. Aubrey	Miss J. A. Simmonds
	Miss J. D. E. Bradley	Mr M. R. Shaw
	Mr K. A. Craggs	Mr J. R. Tizzard
	Mr C. H. Fisher	Mr W. A. J. Watkins
	Mr E. Harland	Mr K. Yapp
Second Year	Mr D. I. Chavasse	Miss J. G. Queen
	Mr B. Corr	Mr N. J. Robertson
	Mr S. M. Davies	Mr T. J. H. Sharp
	Mr M. D. Ferriday	Mr C. A. Totty
	Mr G. Jones	Miss S. M. Trounson
	Mr D. Learmond	Mr S. Young
First Year	Mr K. N. Alders	Miss M. T. Prendiville
	Miss J. M. Corden	Mr S. Rattray
	Mr D. J. D. Curran	Mr G. L. Redfern
	Mr R. W. Grant	Mr I. H. Rooksby
	Mr G. N. Porteous	Mr D. W. Sheppard
	Mr P. A. Prendergast	
Honorary Associates	Professor P. H. Davis	
	Mr P. D. Orton	
	Mr W. H. Brown	
	Mr B. L. Burtt	