

Editorial

The Anniversary Meeting of last May witnessed the first contested Presidential election in our 205 years' history. Initially the period of Presidency was unregulated and varied from the 40 years of the first President to the three years of the third (The Duke of Somerset) and the fifth (Robert Brown). Our first President – James Edward Smith was appointed on 26th February 1788 and the Society went on electing him as long as he was willing to serve. He was, after all, a very distinguished and highly esteemed man, whose works were considered an honour to the Society which he had been instrumental in founding. Then in February 1886 Council decided that no future President should serve for more than four successive years; this was reduced to three in 1931. Most of the early Presidents, other than Smith and Stanley (the Bishop of Norwich) who died in office, resigned when they felt they had served the Society for long enough, though Edward Smith Stanley resigned in 1834 when he became Earl of Derby while John Lubbock (of Bank Holiday fame)* gave up after a five year tenure in 1886 on account of his gout. The one exception was George Bentham who had been President for nearly 13 years when, in a tactical blunder at the General Meeting of February 5th, 1874, instead of signing the minutes he allowed a vote on whether or not there should be a discussion on the alteration of the Bye-Laws (repeating the statutes), which had been passed at the previous General Meeting. When the meeting voted for a discussion he abruptly left the Chair and the meeting broke up. He sent in his resignation the following day. Sir David Prain was the last President to resign finding three years (1916–1919) enough. In this he anticipated by more than a decade – what was to become the normal period of tenure of office, while Sir Sidney Harmer (1927–1931) was the last President to hold office for four years. Of all the previous Presidents only Edward Stanley's election (1837) was not unanimous. Three ballot papers out of 36 had his name crossed out and that of Aylmer Bourke Lambert written in.

As my term as your 43rd President draws nigh, I shall unfortunately have to relinquish the editorship of *The Linnean*. However, I note that Alfred Rendle gave up the Botanical secretaryship (1916–1923) to become President (1923–1927) and then took on the editorship of *The Journal of Botany*. Previously Dunkinfield Scott had also given up the Botanical secretaryship (1902–1908) to become President (1908–1912). Two Zoological secretaries, William Calman (1923–1928) and Humphry Greenwood

* One of the consequences of the Bank Holidays Act of 1871, introduced by Sir John Lubbock (then a fellow) was that Whit-Monday became a Bank Holiday. Previously (1795) the Society had decided to hold its Anniversary Meeting on 24 May, which was taken to be the birthday of Linnaeus. If the 24 May fell on Whit-Sunday (viz 1795, 1801, 1863) then the Anniversary Meeting was held on the Whit-Monday. After the new act came into effect the first occasion the Anniversary Meeting took place on a Bank Holiday was 1874. Ironically the second occasion when the 24 May fell on Whit-Sunday was 1885, during the Presidency of Sir John Lubbock, who decided to hold only a *pro forma* Anniversary Meeting on the Whit-Monday (attended by 3 fellows) with a second Anniversary Meeting the following month. A similar procedure was adopted during the session 1895-96 when 24 May again fell on Whit-Sunday. This time 7 fellows attended the *pro forma* Anniversary Meeting. The problem was finally resolved in 1904 with the new Charter which directed that if 24 May should be a Sunday or Bank Holiday, the Anniversary Meeting should be held on the following day - or on a day within that week. For the record it is now accepted that Linnaeus' birthday is the 23rd May not the 24th!

(1967–1970) both subsequently became President (Calman 1934–1937 and Greenwood 1976–1979); I shall therefore be the third Zoological Secretary (1973–1980) to take up the post albeit after a gap of some 14 years from when I last held office. More interestingly, perhaps, I am the third fish palaeontologist to become President, Arthur Smith Woodward (1919–1923) being the first and Errol White (1964–1967) his successor in the Natural History Museum, the second. Moreover all three of us have been closely associated with King's College, London. Smith Woodward and White were educated there while White not only demonstrated at King's for one term in 1922 but was also made a Fellow in 1958. Ironically, it was during his tenure of office as President that Errol White persuaded me to become a member of the Linnean Society entreating me to look upon it as "my scientific charity". Little did he realize that some 25 years later I should follow in his footsteps and become President of the world's oldest active biological society.

During my period of office, like Bentham before me "I shall endeavour to give of my best to the general welfare of the Society" – at the same time maintaining the broad tradition of biological learning implicit in our motto *Naturae discere mores* (to learn the ways of nature).

Now that *The Linnean* has become rather larger than previously, it would cut down the typing time if contributors who use a word processor could send me a disk as well as hard copy. Large or small disks acceptable, PC or MAC, preferably with your text saved both in your wordprocessor format and as an ASCII or equivalent file, please. Those who still use a pen and/or typewriter, please don't be put off, your contributions are still very welcome.

Society News

This is being written in that season of mists and mellow fruitfulness so beloved by (some) poets who, it may be noted, usually avoid its manifestations by living abroad. This year the mist has been replaced by a somewhat wetter variant called rain. This seems to have avoided the lives of some of our Fellows, notably Professor Ghilleen Prance, who scooped the £250 000 International Cosmos Prize, awarded by a Japanese foundation for his distinguished work in the Amazonian rain forest. Professor William Stearn was awarded the Engler Gold Medal at the recent International Botanical Congress in Yokohama. We also need to note that Dr. Gordon Cook has become President of the Royal Society of Tropical Medicine and Hygiene. Our congratulations go to them all, as they do to Mrs. Virginia Purchon, who launched *Action for Biology in Schools* last year with the Society's support and blessing, and has received a grant of £2000 from COPUS, the Committee for the Public Understanding of Science.

The Society has lost a number of distinguished members; the Society was represented at the memorial service to Dr. Alwyn Gentry, of the Missouri Botanic Garden, by Miss Maridowa Williams. One of the Society's oldest and most senior Fellows, Dr. Ethelwynn Trewavas, Fellow *Honoris causa* has died, and will be commemorated at a future meeting of the Society. George Cansdale, associated with the London Zoo, has also died. Obituaries to all these have appeared in national

newspapers. Dr. Dirk Onno Wijnands FLS of Wageningen has also died, a few days after returning from the Yokohama Botanical Congress, where he presented a paper on the preliminaries of Thunberg's travels to Japan. Professor A.D.J. Meeuse FLS, his teacher and supervisor, writes: "Onno was a most competent researcher with broad interests and a volatile mind, but he was not only respected for his scientific achievements but also for being a kind, most helpful and erudite person, which made him many friends, who will remember him for his instant insight into other persons' problems and his special sense of humour. He was very proud of his membership of the Society." Professor Meeuse also noted that Dr. Wijnands lectured at the celebration of Professor Stearn's 80th Birthday, and was the author of *The Botany of the Commelins*, Rotterdam: Balkema, 1983. Certainly, he was a frequent visitor to the Society, and will be missed by the staff here, as well as his numerous colleagues, correspondents, former associates and friends.

It was kind of one Fellow, Dr. Brian Hopkins, to send in a newspaper cutting about witchweed (*Striga* spp.), a parasitic plant wreaking havoc in Africa, and to note that a former winner of the Dennis Stanfield Prize, Professor S.N.C. Okonkwo of the University of Nigeria at Nsukka, is at the forefront of the fight against this unwelcome guest, which has been calculated to cause crop losses of £7 billion pa in Africa.

Members are reminded that nominations for office and Council must be in the hands of the Executive Secretary by 1st March 1994. Nominations for the Society's medals, for FMLS and Fellowship *Honoris causa* will be considered by Council at its meeting on 20th January 1994. Applications for the Society's grants, including the NERC Grants for Taxonomic Publication, must be received by 31st March 1994.

This year marks yet another milestone in *The Linnean's* history. Four issues will appear, in January, April, July and October. The April issue will be in the form of an Annual Report to members and will contain the reports of the President, Treasurer and Executive Secretary, with the audited accounts of the Society, together with the formal summons to the Anniversary Meeting. When the appropriate guidelines from the Charity Commissioners appear, the Annual Report of the Society will conform to them.

Apologies are due to members for the dropping of the meeting on mahoganies from the Society's programme in the autumn of last year. The meeting will hopefully be going ahead in the 1994-95 session.

The Society's publishers have managed to keep the cost of Members' copies of journals to £25 for some years. They are raising the price to £27 in 1994. This takes the contributions for those taking more than one journal to the following levels:

Fellows with two journals	£67 (formerly £65)
Fellows with three journals	£94 (formerly £90)
Associates with two journals	£47 (formerly £45)
Associates with three journals	£74 (formerly £70)

For those paying their contributions by direct debit, the appropriate adjustments will be made to those arrangements by the Society in May 1994.

Should the Government put Value Added Tax on books and journals in November 1993, as seems likely at the time of writing, further adjustments may be necessary.

The Society was visited by an excise official in September 1993. He was honest and helpful. For organisations like ours, he said, VAT is a nightmare. Well, Amen to that. Even excise officials have difficulty understanding just what is going on. VAT on the Society's books and journals will probably occasion major cerebral dysfunction in the office. Don't watch this space - next time you read it might have cost 17.5% more!

Society Meetings

January and February each have one Society evening meeting. *Journalism in the Scientific Literature* will be the topic of an meeting addressed by the Editor of Nature, Dr. John Maddox on **Thursday, 20th January 1994**. One of the Society's new Honorary Fellows, Dr. Norman Moore, will be considering *The Biological Consequences of Grant Aid to Farmers* on **Thursday, 17th February 1994** which those with experience of the UK environmental scene will recognise as a particularly hot potato at present.

Preserving the Archives of Nature is the theme of a multi-presentation evening, followed by a reception, on **Thursday, 3rd March 1994**. It will also be a launch celebration for the Society's booklet of the same title. Through members of its Library Committee, the Society is greatly concerned about the potentially disastrous loss of historically vital archival records relating to the UK pioneering nature conservation movement. Losses are occurring through ignorance of what can and should be done to ensure preservation in Record Offices, Libraries and Archives. It is known, for example, that collections of individuals' papers, accumulated during a lifetime of cutting edge activity, have been consigned to the local rubbish tip. There will be five short presentations on aspects of the problem and some solutions will be put forward.

Professor G.E. Fogg has asked us to make an addition to the title of his talk: *Non-Flowering Plants in the Antarctic*, which will be on **Thursday, 24th March 1994**.

Systematics 2000 on **Tuesday, 12th April 1994** has been the subject of a preliminary circular to Members in *The Linnean* for July 1993. Additional information about this important meeting with our colleagues from the USA is circulated with this issue.

Hogg's Protoctista is the title of a meeting organised by Professor Lynn Margulis, of Amherst, Mass. on **Thursday, 14th April 1994**, and a busy week is concluded with Society participation in the Institute of Biology's *Biology '94* programme at Loughborough University, where Mr. Brian Ford will be organising a session on the *History of Biodiversity*.

Two meetings above and the meeting on the Pitcairn Islands on **5–6th May 1994**, with the Indus River meeting on **13–14th July 1994** involve a number of speakers from overseas, and the costs of these meetings will not be insignificant. Any Society Member who has any thoughts on suitable sponsors for these meetings should contact the Executive Secretary.

The new Specialist Group, the London Freshwater Group, is planning two meetings on **11th March 1994** and in November 1994. Details from the organiser of the group, Mrs. Rosalind Pontin, c/o The Linnean Society.

Other Meetings and Events

President-elect, Professor Brian Gardiner represented both the Society and King's College at a recent international symposium "*Darwin and the Beagle in Chile: Evolution Today*", a satellite meeting of the ICSU (International Council of Scientific Unions) General Assembly, held in Santiago 29 September – 1 October 1993.

Professor Gardiner, who had initially helped organise the accompanying exhibition, presented the University of Chile with a 3 ft. reproduction of the Linnean Society's Darwin portrait. He also presided over the first day's proceedings and delivered the opening lecture on behalf of Professor Richard Darwin Keynes, F.R.S. (who was unable to attend) – entitled "*The Voyage of the Beagle*". Other Linnean members who



Santiago, Sept. 1993: David Galloway and Brian Gardiner.

participated included Dr David Galloway – the U.K. coordinator of the exhibition – who took out herbarium sheets of both angiosperms and lichens collected by Darwin in Chile, and the Editor of the *Zoological Journal*, Dr David Norman who exhibited (courtesy of the Sedgwick Museum) various metamorphic rocks Darwin had collected from the Andes 160 years earlier. Both also presented papers to the symposium as did Dr Duncan Porter (Virginia) – fresh from the successful "Spruce" meeting in York, of which more in our next issue.

The importance of Darwin's sojourn in Chile can be gauged by the fact that before he left Iquique on 14 July 1835 (that is two years before he adopted a transmutationist hypothesis) he had already sketched a narrative history of the South American continent in which the commencement of life, the extinction of some species and the creation of others were all given a place. Before the end of the voyage he had reached the conclusion that the doctrine of the fixity of species would have to be replaced by some form of evolutionary theory, though he had not arrived at any mechanism. Moreover the earthquake at Concepcion on February 20, 1835 and his study of the eruption of

several volcanoes, including Antuco and Osorno allowed him to state that “the forces that slowly raise the continents (and the mountain ranges) are the same as those that occur during large earthquakes.” He further inferred that foliated rock once possessed a plastic state and concluded that the earth floated on molten rock which was expelled through volcanoes. It took a further 130 years before a more precise model (viz plate tectonics) of the internal dynamics of the earth was arrived at.

The meeting and exhibition received financial backing from both Foreign Office and British Council while King’s, in a goodwill gesture to the University of Chile, sponsored Professor Gardiner.

The exhibition together with the Darwin portrait will eventually be permanently housed in the Museo Nacional de Historia Natural, Santiago.

The Science Museum has mounted a permanent exhibition entitled *Science in the 18th Century: the George III Collection*. Members will doubtless be aware that the Society’s early years were during the reign of this monarch, who granted the Society its first Charter in 1802.

The relocated International Mycological Institute, now at Bakeham Lane, Egham, Surrey TW20 9TY, is holding a meeting *The Identification of Industrially Important Fungi* on **8th March 1994**. Contact Miss J. Pryse.

Among its many schemes for the support of scientific research in developing countries, the *International Foundation for Science* has recently invited young scientists of merit in these countries to submit proposals for research projects in the fields of forestry and agro-forestry. Particular consideration will be given to research dealing with forestry in dry areas. Anyone interested should write to the International Foundation for Science, Grev Turegatan 19, S-114 38 Stockholm, Sweden.

From the Archives

2A Whitehall Yard

15th May 1848

Dear Bennett,

I send herewith the papers from Capt. Stanley’s expedition of which I spoke to you.

The first – that on *Physalia* – was sent by Capt. Stanley to the Bishop, expressly for the Linnean, but with the condition that I should see it before being read.

The sequel of it only arrived lately and was sent to me.

They are both by Mr. Huxley, Capt. Stanley’s assistant surgeon. They are very admirable memoirs on a very difficult “subject” and one that requires illustration sadly. It is indeed a pleasant prospect to see the likelihood of this author taking a high rank in our science – for his as yet is an unknown name. If read at the Society they had best both be given in as communicated by the Bishop. It will please the president

the publication of them will come under consideration, I may say that the whole of the figures would easily go into 5 plates, which done in the way my medusae are being executed for the Ray (Society) – (similar animals) – would cost about 2£ a piece.

The whole of either of the papers need not be read but parts might be selected of very readable character.

I shall have my notice of “some instances of *Peloria* monstrosities in the *Viola canina*” – for your next meeting also, if that be soon.

ever most sincerely

Edward Forbes

The above letter is in essence a referee’s report by Edward Forbes (see below under Picture Quiz) on T.H.Huxley’s first paper on *Physalia*. The paper was sent to the President, Edward Stanley, the Bishop of Norwich, by his son – Captain Owen Stanley who commanded H.M.S.*Rattlesnake*. Forbes was at the time Professor of Botany at King’s College and Palaeontologist to the Geological Survey. He had been instrumental in the foundation of both the Ray (1843) and Palaeontographical Societies (1847).

The paper by Huxley appeared as an abstract in 1851.

Picture Quiz

The August Quiz (9 (3): 12) featured a sketch of Edward Forbes (1815–1854) aged about 30, made by W.J. Radcliff (assistant to William Pogany, the art book illustrator). Forbes was born in the Isle of Man, where his father was a banker. Though none of his family had the slightest taste for scientific studies he showed an early passion for natural history and by the age of twelve owned a copy of Turton’s Translation of the *Systema Naturae* and had perused both Buckland’s *Reliquiae Diluvianae* and Conybeare’s *Geology of England*. Eventually he was sent to Edinburgh University where he came under the influence of Professors Graham and Jameson who instilled in him a lasting interest in the distribution of plants and animals.

The year 1837-38 he spent in Paris attending classes at the Jardin des Plantes, interspersed with miscellaneous literary pursuits. The following year he became Secretary of the British Association Meeting held in Birmingham. In 1841 at the invitation of Captain Graves he joined the surveying vessel H.M.S. *Beacon* as naturalist on an expedition to the Aegean. While in the Grecian Archipelago his friend Goodsir put him forward for the Chair of Botany at King’s College, London. He was duly elected Professor of Botany and gave his inaugural lecture on 8 May 1843. His salary of £100 per annum (from King’s) was so inadequate that the following month he applied for the position of, and was subsequently appointed Curator and Assistant Secretary to the Geological Society (salary £150 per annum). The latter position he held until 1844 when he was appointed Palaeontologist to the Geological Survey. In 1851 he gained a second chair when he became Professor of Natural History in the Government’s School of Mines Applied to the Arts (now part of Imperial College). Finally shortly before he died, he realised his life’s ambition when he was appointed Regis Professor of Natural History in the University of Edinburgh.

At an early stage, Forbes became interested in the origin of the British fauna and flora and in 1845 divided the flora into five geographical provinces postulating how each might have reached Britain from the Continent. He also theorized that the animals must have migrated over now submerged landbridges. He subsequently incorporated much of this work on biogeography into a Survey Report entitled *Essay on the Glacial Epoch and the Origin of the existing fauna and flora of Great Britain*. Charles Lyell was so impressed by the Report he wrote on 14 October 1846 “your paper with an introduction by Owen has come out at a peculiarly opportune period, when Agassiz, Alcide d’Orbigny and their followers, are trying to make out sudden revolutions in organic life in support of equally hypothetical catastrophes in the physical geography of the Globe”. Forbes later constructed, for the Survey, *A geological and Palaeontological Map of the British Isles*, but much more importantly he constructed what was the first World Map entitled *Distribution of Marine Life, illustrated chiefly by Fishes, Molluscs and Radiata, showing also the limits of the Homiozoic Belts*. In



Clue: A logician of independent means.

this he correlated changes in the marine faunas of the North Atlantic with those in the terrestrial floras of Europe. Edward Forbes' largest works include *Natural History of British Mollusca* (with Hanley) and *Travels in Lycio* (with Spratt). He was a fluent writer on many subjects and a frequent contributor of book reviews to the *Literary Gazette* (well over 100 titles ranging from Murchison's *Siluria* to Davy's *Salmonia; or Days of Fly-Fishing* and Melville's *Moby Dick*).

He also had a fancy for verse and song and in his capacity as Lion King or Chairman of the Red Lions (an informal group of naturalists which included Ramsay, Owen and Huxley – see Gardiner 1993 *Archives of Natural History*: 20) he composed such poetry as *The Song of the Oyster*, the famous *Dredging Song*, *The Fate of the Do-Do* (pronounced *Doo-Doo*) and *The Sea Serpent*. While in celebration of his election to the Royal Society on 13 February 1845, he dashed off a short poem to the *Literary Gazette* entitled: *Valentine by a Palaeontologist*

Borne upon Pterodactyl's wings
This heart which once you deemed of stone
Model of maids, to thee I bring
And offer it to thee alone.

Not Owen pondering o'er bone
Of great Diornis, fonder grew
Of mighty wingless birds unknown
Than I, sweet maid, of you.

The Glyptodon, which Darwin found
Beside the South Atlantic main
Was in no harder armour bound
Than that my spirit did enchain
Till, bade by thee, Love rent in twain
The fetters, which my fancy tied
To boulder, glacier and moraine
And bore me to thy side.

Like some fantastic Trilobite
That perished in Silurian sea
And long lay hid from mortal sight
So was the heart I yield to thee.
Now from its strong matrix free
Thy Palaeontological skill
Once more hath called it forth to be
the servant of they will.

Huxley later said of Forbes "he has more claims to the title of Philosophic Naturalist than any man I know of has in England". Forbes was universally admired as botanist, palaeontologist, marine zoologist and systematist. Despite his short life he was an extraordinarily popular Victorian scientist.

There was a glut of correct answers including Marcus Trett, David Allen, Gareth Davies, Geoff Miller, Ken Smith, E.Alison Kay, David Pye and Jim Green.

Correspondence

Sedgefen House
37 Meadow Walk
Harpenden
Hertfordshire AL5 5TF

5.9.93

Dear Professor Gardiner

The gentleman depicted in the Picture Quiz (The Linnean, Volume 9, No.3) was the brilliant but ill-fated Edward Forbes. His somewhat sad expression is depicted in the 1850 lithograph by Mcguire. We note with interest an early example of the application of Victorian correcting fluid which, unfortunately, has obscured the date on the bottom right hand side of the copy that you have reproduced. Born on the Isle of Man in 1815, Edward Forbes was educated, for the most part, in Scotland where he gained an interest in sublittoral ecology. He worked with the great Irish naturalist William Thompson, undertaking surveys off the west coast of Ireland and, briefly, with Sir Wyville Thomson on the subtidal ecology of the Firth of Forth. With the publication of his *History of British star-fishes and other animals of the class Echinodermata* (1841), followed by *A history of British Mollusca and their shells* (1849–1853), he became a widely respected marine zoologist. On other fronts, his acclaim may not have been so universal. His theory of polarity appears to have upset Wallace. Speaking about his own paper *Succession of species*, Wallace says “It was the promulgation of Forbes’ theory of polarity which led me to write and publish, for I was annoyed to see such an ideal absurdity put forth, when such a simple hypothesis will explain all the facts” (see A.R.W.’s letter to Bates, January 4th 1858, cited in *My Life*; volume 1, p.358). Indeed, Wallace fails singularly to cite Forbes in his subsequent works.

Not having private means, at one stage Forbes supported himself with two "tedious" posts which ran concurrently.* These were Curator to the Geological Society, for which he was paid £150 per annum, and Professor of Botany at King’s College, for which he was paid “less than £100 per annum”. He was to go on to say that “People without independence have no business to meddle with science”; a quotation that seems to have struck a chord with certain university grant awarding bodies. His untimely death in 1854 at the age of 39 was to deprive Edinburgh of its newly appointed Professor of Natural History and the world of truly talented marine zoologist.

Yours sincerely

MARCUS TRETT

* Forbes was forced to take both jobs as a consequence of family misfortunes (his father’s business failures and the concomitant loss of remittances). His theory of polarity embraced space, geological time and biological organization. Editor.

11 Rotherwick Hill,
Ealing,
London W5 3EQ.

8.9.93.

Dear Brian,

Am I right in thinking that the subject of the Picture Quiz in the August number of *The Linnean* is Edward Forbes (1815–54). He should be recognisable by anyone who taught or studied in the Forbes Laboratory at Imperial College. As you know, his appointment as palaeontologist to the Museum of Practical Geology marks the starting point of what eventually became the Department of Biology at Imperial College.

With very best wishes,

Yours,

Gareth

R.G. DAVIES

Queen Mary & Westfield College
London E1 4NS

15.9.93

Dear Brian,

Who? (August 1993).

At last I know an answer! Must be an easier one than usual.

This is Edward Forbes, 1815–1854, dredging pioneer and naturalist on the HMS Beacon expedition to the Aegean, 1841–42; later (all too briefly) Professor of Natural History at Edinburgh. Author of:-

“Hurrah for the dredge, with its iron edge,
And its mystical triangle,
And its hided net, with meshes set,
Odd fishes to entangle! etc.”.

I had not associated him with landbridges, however; rather with classification of marine environments by depth and the unfortunate prediction that life must be absent below 300 fathoms.

Best wishes,

Yours,

David.

J. DAVID PYE

It is No Longer Necessary to Change Botanical Names in most ranks for Non-taxonomic Reasons

“What is now needed is a general awareness of the fact that it is no longer necessary to change a name, at least in the principal ranks, for reasons other than those mandated by new taxonomic insight”

(Greuter & Nicolson, 1993: 926)

The above quotation by the Rapporteur-général and Chair of the General Committee on Botanical Nomenclature encapsulates the net effect of a variety of decisions made by the Nomenclature Session of the XV International Botanical Congress in Yokohama, Japan. That the close of the session on 27 August 1993 coincided with the passage of a typhoon through the city was an appropriate sign, bearing in mind the impact the changes made to the International Code of Botanical Nomenclature will have on the working practices of plant and fungal taxonomists. The changes adopted by the required 60 % of votes cast reflect the most fundamental change in direction of botanical and fungal nomenclature this century. Most of the changes came into effect on adoption by the Plenary Session of the full Congress on 3 September 1993. As the new edition of the Code will not be available until June 1994, it is essential that all plant and fungal taxonomists are alerted to these changes now. This note is intended to help fill that gap so that full advantage can be taken of the changes can be taken immediately in the interests of nomenclatural stability and the reputation of taxonomy as a whole (Hawksworth, 1992). The overall attitude of the XV Congress is reflected in a Resolution submitted by the Nomenclature Section to the Final Plenary Session of the Congress and which was adopted by the Congress without dissent:

“Considering the great importance of a stable system of scientific names of plants for use in the pure and applied sciences and in many other domains of public life and economy; noting with satisfaction recent important improvements of the International Code of Botanical Nomenclature and ongoing efforts to explore new avenues for increased stability and security in the application of plant names; the XV International Botanical Congress urges plant taxonomists, while such work continues, to avoid displacing well established names for purely nomenclatural reasons, whether by change in their application or by resurrection of long-forgotten names;...”

Taxonomists are thereby mandated by the Congress not to disrupt established names, nor to resurrect long-forgotten names, nor to change the applications of names during the period to the XVI Congress, to be held in St Louis in 1999. Taxonomists are encouraged, with immediate effect, to cite this Resolution rather than to perform nomenclatural acts contrary to its sentiments. Editors and referees also need to be appraised of this dramatically changed position; IUBS will be contacting them formally in this respect early in 1994.

The principle changes made are summarized below. Full texts and commentaries on the 320 proposals submitted are provided by Greuter & McNeill (1993), and the results of the ballots and Congress actions are presented by McNeill (1993).

Rejection: “Any name that could cause a disadvantageous nomenclature change may be proposed for rejection”. A major opening up of the possibilities, which means that any name in any rank can be rejected for any reason provided that the relevant Committee regards its loss as advantageous. Any taxonomist finding that an earlier name threatens one in use should formally propose it for rejection. If that fails, no change need be made pending the 1999 Congress by citing the 1993 Congress Resolution. Priority of publication thus now counts for little in botanical nomenclature.

Conservation: Restriction of conservation to names of species “of major economic importance” was removed. Any name at that rank can be considered for conservation, regardless of economic considerations, if its loss is regarded as disadvantageous by the relevant Committee for that group. This is a remarkable and most welcome change from the attitudes at the 1991 and 1987 Congresses.

Names In Current Use: While the package to introduce the provision for protected Lists of Names in Current Use into the body of the Code was narrowly defeated in that it obtained 55% and not 60 % of the votes cast (231 vs. 190). However, a Standing Committee was appointed “to initiate, assist, coordinate and vet the production of lists and of updatings of the existing lists of NCU and to report to each subsequent International Biological Congress”. This Committee can be expected to work hard to upgrade the quality of the List for the 1999 Congress. That the Congress view was mainly a result of concern as to the quality of the three lists before the Section (Greuter *et al.*, 1993; Hoogland *et al.*, 1993; Pitt *et al.*, 1993) is evidenced by the passing of a special resolution covering names in one family including those of species rank: “The Nomenclature Section, noting that the List of Names in Current Use for the Trichocomaceae, which has already been approved by the International Commission on Penicillium and Aspergillus of IUMS, urges taxonomists not to adapt names that will compete with or change the application of any names on that List” This augers well for 1999.

Registration: From 1 January 2000 names must be registered in order to be validly published. This will be by sending copies to one of the registering offices approved by the IAPT. Details are to be worked out by IAPT before the 1999 Congress. There will be no censorship in this arrangement, responsibility being placed on authors, editors or publishers. This will overcome problems of defining effective publication.

Typification: A pragmatype (“protype”) can be selected as an “interpretive type” when the holotype or other original material is “demonstrably ambiguous and cannot be critically identified for the purposes of the precise application of the name”. Such types will not be supplatable if later work using new technology shows the pragmatype was not conspecific with the holotype. No name need now be put aside because the original material is in an inadequate state of preservation with respect to critical characters needed for identification.

Living types: Permanently preserved cultures maintained in a metabolically inactive state (i.e. by freeze drying or in liquid nitrogen) are now acceptable as nomenclatural types. Any cultures revived from such types are to be referred to as “ex-holotype” etc. to clarify their status. It is recommended that deposits of such cultures are made in at least two public or institutional culture collections. This provision is retroactive,

legitimizing the practices of yeast taxonomists in particular.

Phylum: This rank term was accepted as an alternative for “division”. I hope that it will be adopted quickly in all textbooks treating plants and other groups of organisms together to avoid the currently anomalous situation.

Coverage: Clarification that the Code covers all organisms traditionally tested as plants, including slime moulds, cyanobacteria, chytrids, photosynthetic chromists, etc., regardless of the kingdoms to which they are referred taxonomically.

Herbaria: Holotypes must now be deposited in herbaria belonging to the public or institutions and which have a policy of open access by researchers after 1 January 1995. (Holotypes cannot be in personal collections by definition from that date.)

Suppressed Works: A new Appendix is to be established to list published works that for any reason are not to be treated as sources of names. Works can be added to the “List of Suppressed Works” by the same system in operation for the conservation and rejection of names.

Sanctioned Fungal Names: The various clarifications proposed by the Committee for Fungi (see Greuter & McNeill, 1993) were all accepted.

Latin: While English was not accepted as an alternative to Latin, it obtained more votes than I would have expected from an audience of primarily nomenclaturalists (91 vs 328). For all fossil groups, “Latin or English” is now specified (whereas any language was previously acceptable).

“In” and “ex”: No “in” should in future appear in any author citations, it being decided to be a part of the bibliographic reference only.

Illegitimacy: No major changes were made as it was considered to be potentially too dangerous to change current practice before NCU's were in place.

Code Harmonization: In accordance with concerns expressed at the IUBS General Assembly in 1991, a Special Committee appointed by the Congress to look at ways in bringing the Codes closer together, at least for “bridging” groups. A first exploratory discussion on this topic involving 2-3 representatives from each biological Code is to be convened at IMI on 16-18 March 1993, with support from IUBS and the Royal Society.

Committee Name: The “Committee for Fungi and Lichens” has at last been renamed as the “Committee for Fungi” to reflect the fact that it is the names of lichen-forming fungi that are considered by this Committee.

I personally find it remarkable that so much progress has been made towards making botanical nomenclature a pragmatic servant of science, rather than a historical and pseudolegalistic endeavour that diverts taxonomists away from their primary tasks, since basic issues started to be revisited with vigour from 1987-88 (see Hawksworth, 1991). The groundswell of opinion reflected in the Yokohama voting can be expected to increase, and to lead to even more improved procedures being put in place at the 1999 Congress. Nomenclature from the year 2000 promises to be a very different animal from that we have been used to during this century.

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D.L. HAWKSWORTH

Jurassic Park

The book and film of this name are about the creation of a dinosaur theme park on a tropical island. The animals were generated from dinosaur DNA isolated from ancient blood-sucking insects trapped in amber, using frogs and other species as genetic midwives. An unlikely story¹, perhaps, but given the potential of genetic manipulation, the possibility of setting up a biological time machine some other way should not be overlooked. Most animal DNA (97%) is regarded as junk and the remainder consists of an assortment of controlling elements and code for structural proteins, many of which will be for housekeeping functions within the organism. These housekeeping genes, for such tasks as the Krebs' cycle or for the production of collagen in skin and bones, do not differ significantly from organism to organism and do not change much over long periods of evolutionary time. Genes for the control of development are believed in man to encompass some 42 *homeobox* sequences each corresponding to a protein of 60 amino acids, with some 10 ancillary *paired box* genes capable of generating 130 amino acid proteins which are assumed to control the transcription of genes to other proteins. These proteins are *small* and the DNA with which they are assumed to interact to do this will be small also. The book makes the point that birds, rather than lizards, might be more closely related to the dinosaurs. Molecular tinkering with bird DNA might be a useful starting point on the way to recreating their saurian ancestors. The task might not be too difficult in view of the small number of modest sequences involved.

In the book only female dinosaurs were generated to prevent the possibility of their breeding. Unfortunately, no-one seemed to realise that some amphibia, such as the

frogs whose DNA was used as a genetic midwife, are capable of sex change, and dinosaurs hatched in the wild were soon discovered. However a problem which would need to be faced, if discrete breeding populations of different dinosaurs were to be maintained in a theme park, is the molecular nature of the reproductive ring fences which define species. If we assume that, in Nature, each new species arises by some bifurcation from an existing species, the number of bifurcations needed to account for the present 3–30 million species is no more than 25.

The modesty of such a number in the evolution of the millions of species we have today and in the fossil record leads to a consideration of the sort of molecular changes which make one species different from another. The nature of the changes leading to a new species has been thought of as relatively cataclysmic in genetic terms – additional chromosomes, changes in chromosome size or mutations critically affecting developmental or reproductive processes, and not the result of the accumulation of a number of small mutations of small effect. Whatever the change it must happen simultaneously to a breeding population if it is to be propagated as a new species. An understanding of the underlying nature of this process could help us to establish new, or old, species *ab initio* using molecular techniques. A recent meeting of the Genetical Society (29.4 – 1.5.93) shed a little light on the problem. Miroslav Radman, of the Jacques Monod Institute, Paris, made the point that mutation itself is under genetic control. Whilst *damage to DNA* may be relatively randomly distributed along chromosomes, *the lack of repair* of such damage, which establishes mutations, is dependant on the availability of repair enzymes and suitable DNA precursors for carrying out the repair. Reducing their availability increases the rate of mutation. In mixed cultures of bacterial strains – with and without attenuated repair systems – bacteria with attenuated repair systems survive better conditions of environmental stress because they generate appropriate mutants more easily than the wild type.

DNA repair is a complex process in all species and shows considerable commonality amongst them, suggestive of a long evolutionary history. There are only two permitted base pairs in DNA, A-T and G-C, from the ten possible pairings of these four bases. The other eight pairings are known as *mismatches* and their presence in DNA is detected by a *mismatch repair system*. According to Radman and his coworkers², the mismatch repair system is deeply involved in the process of recombination in prokaryotes, defined as the exchanging of genetic information between homologous regions of doubly stranded DNA. In sexually reproducing eukaryotes, this process is familiar in the events of meiosis and, in a more limited way, in the site-specific recombination responsible for generating antibody diversity in the immune system. Radman noted that recombination between two bacterial chromosomes is prevented if their DNA sequences differ by more than 20%. In bacteria, recombination involves the realignment of stretches of homologous regions of two separate DNA single strands (from the same or different species) to form a new double helix; if the strands are too different, the mismatch repair system gives up its task of ensuring precise base pairing of the two strands within the new double helix and the mismatched sections are extensively degraded so that no viable recombinants arise. For this degradation, the *differences* between the two strands need to be fairly evenly spread along the DNA's; mutations concentrated in particular spots are not as effective in preventing

recombination. Hence a broad spread of mutations in the DNA of two closely related prokaryotes is likely to enhance their survival as separate species.

If the mismatch repair system is disabled, two apparently contradictory consequences flow. Firstly, the mutation rate increases, adding to the divergence between species. But secondly, recombination becomes easier because the mismatch repair system no longer acts as a barrier to homologous recombination between divergent DNA strands. So, for example, it has proved possible to recombine relatively easily *Escherichia coli* and *Salmonella typhimurium*, two organisms which diverged some 150My ago, and whose DNA's differ by *ca.*20% in their base sequences, by attenuating the mismatch repair system of the bacterium which is to receive the other's DNA. Stable, hybrid 'species', *Salmorichias*, can be generated by this means.

In eukaryotes, the situation is unlikely to be dissimilar, since mismatch repair systems seem universal. Recombination is a more involved process than in prokaryotes, but is nevertheless believed to play an important role in generating sequence divergence³, particularly *sister chromatid exchange* and *slippage replication*. The former of these is the exact parallel of bacterial recombination, whilst the latter is caused by the formation of loops within the double helix of DNA causing substantial deletions or duplications of short stretches of DNA, particularly in repetitive sequences. Such repetitive sequences constitute a substantial proportion of eukaryotic DNA (*ca.*40% in man) and are part of the junk DNA. Sequence analysis of particular repetitive sequences, eg. *Alu*, suggests around 20% divergences between closely related mammalian species. By comparison, the divergence *within* a species, such as man is less than 0.3%. Within even that small envelope of divergence, however, variations in sequence of DNA caused by slippage replication of repetitive sequences are responsible for an individual's uniqueness which can be exploited in genetic fingerprinting.

A change of sequence of 20% leading to the reproductive isolation of a species might be seen as substantial. It seems, however, to be the result of the accumulation of many smaller changes in the DNA of otherwise neutral effect. The most likely place for the majority of such changes is within DNA which makes no contribution to the phenotype – junk DNA. Major chromosome changes *within a species* do not seem incompatible with survival and breeding⁴, as exemplified by the South American marsh rat, *Holochilus brasiliensis*. Two (or more) reproductively isolated populations of a species might well generate different patterns of mutation in their DNA's to the point where they could no longer interbreed because they cannot recombine – they have become separate species. Speciation is seen largely as a biological accident, but may, of course, be accompanied or followed by significant phenotypic changes due to changes in coding DNA.

The mutation rates implicit in such speciation depend on the size of the genomes involved. In the *E. coli* and *S. typhimurium* case cited earlier, given genome sizes of *ca.*4x10⁶, the mutation rate necessary to achieve a sequence difference of 20% in 150My is 5x10⁻³ base pairs/year. For the higher primates, the figure is 100-1000 base pairs/year, two to three orders of magnitude higher than the rate suggested in 1968 by Kimura⁵ for neutral mutations, and reiterated more recently².

These figures are interesting in that they suggest that prokaryotes, with little junk DNA, are much less likely to mutate, and therefore evolve to other species, than organisms with substantial amounts of junk DNA. Perhaps that is why it took multicellularity so long to evolve. Since, with some notable exceptions, amounts of junk DNA roughly parallel evolutionary complexity, rates of evolution must also have speeded up. Periods of rapidly increasing biodiversity in the fossil record might be associated with particular species increasing their junk DNA very rapidly (as some extant plants seem to have done).

For Jurassic Park's dinosaurs, all that is required is to put together different packages of coding and non-coding DNA in the chromosomes of each species. Using existing bird species as midwives should provide the basis for enough of those, without, as far as we know, any risk of sex changes. Would-be dinosaur breeders might, on the other hand, prefer to generate their own junk DNA by randomly programmed DNA synthesis, and derive their really useful DNA for manipulation from organisms which divest their somatic cells of junk – chromatin diminution, see (6) – such as *Ascaris* spp. And a feature of the end of the book which may have escaped the notice of many was that the dinosaurs wreaked such mayhem and (human) bloodshed that the human inhabitants of the island were obliged to quit the island. A few dinosaurs in the rain forests, or even in the Lake District, might not come amiss.

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JOHN MARSDEN

The Naturalist at Law

My recent short paper¹, having stimulated some interest in Medical Jurisprudence, I now venture to give some account of Dr John Evelyn Thorndyke and his creator, Dr Richard Austin Freeman.

Richard Austin Freeman M.R.C.S., L.S.A., was born in 1862, educated privately and at the Middlesex Hospital where he qualified in 1886, serving a term as House Physician before joining the Gold Coast Medical Service. He then joined the Ashanti Expedition of 1889, and was on the Anglo-German Boundary Commission of 1890, and invalided out a year later. After some five years of general practice, he joined the Prison Medical Service, followed by a period with the Port of London Authority. In the First World War Freeman served in home units and was made a Freeman (sic) of

the Society of Apothecaries. All this experience was to become invaluable to him as a writer – he had already published an account of Ashanti in 1898 – and for the next forty years or so embarked on a career as a writer of beautifully crafted and accurately detailed crime fiction, together with two or three romantic novels – one of them somewhat reminiscent of H.G.Wells. His house at Gravesend was full of Ashanti memories, war masks, spears, shields, beads etc. and Freeman drew on these in some of his tales.

Freeman's novels are also notable for their introduction of many diverse subjects – Botany, Zoology, Haematology, Parasitology, Physiology and the Forensic sciences, and the reader is introduced to various crafts, painting and drawing¹³ (he was an accomplished illustrator of his own stories), pottery,^{2,3,4} sculpture⁵ and, of course, microscopy: many readers may have been interested enough to have taken up some of these.

The characters in the novels are so colourfully and sympathetically drawn that they become friends, and one looks forward to their appearance as the tales progress. There is Dr Christopher Jervis, frequently the narrator, an old student of St Margaret's Hospital and friend of Thorndyke's, used for the discussion of methods and court procedures – he is also a barrister – and serves as a stout ally in many difficult situations, and a means whereby the reader can enter No 5A King's Bench Walk, and perhaps identify with some of the characters who come to consult with Thorndyke.*

There is Nathaniel Polton, laboratory assistant, artificer, cook and friend, by training a clockmaker and optical instrument genius, perhaps the most endearing of all Freeman's creations. Befriended by Thorndyke when ill and destitute in St Margaret's Hospital, and taken into his employ, he is frequently able to contribute some remark or piece of information which proves vital to the story. A small man with old-fashioned courtliness and “incredibly crinkly smile”, he has his own story, told in *Mr Polton Explains*⁵. We meet old Brodribb, solicitor – a vintage one this, like the claret he enjoys – other lawyers like Penfield, Mayfield and Marchmont, Superintendent Miller of Scotland Yard, and a host of sea-faring men like Captain Grumpass⁶, of Trinity House, Cyrus Bawley, and charwomen such as Mrs Jablett and others bearing Dickensian names, and all drawn with such skill as to make the reader feel that they exist: then Dr John Evelyn Thorndyke himself.

Thorndyke is a tall, good-looking figure, serious but with his own kind of humour, master of many sciences: Brodribb might have described him as “Medicus, Juris consultus et Rerum naturalium investigator”. His early life is never described, but his medical and other studies are to be found in the first Thorndyke novel *The Red Thumb Mark*⁷.

Thorndyke, naturalist-at-law, is given a large part in Freeman's stories. He was a veritable ‘snapper-up of unconsidered trifles’ for which he carried a small tin box into which he would place hairs – animal and human, dust (vegetable and mineral), feathers, carpet fibres, fluff and possibly the odd button. All these were taken home to his

* On my first visit to London as a schoolboy, I made a beeline to King's Bench Walk, and had to make-do with Number 5: I was even cheeky enough to go up to “The First Pair”!

chambers in 5A, King's Bench Walk, Inner Temple, mounted on microscope slides and stored in a cabinet for reference and comparison with material found in the course of investigations. In *Munera pulveris*, the second part of the story *A Wastrel's Romance*⁸, Thorndyke extracts dust from a coat by means of Polton's Patent Dust Extractor, he and Jervis examine the result in microscope preparations, and between them identify chalk, wheat and rice starch, seed cortices, stone cells, turmeric, pepper resin cells, pimento spiral vessels and starch grains of cocoa and graphite, and lupulin glands of hops. From all this data, and from the Post Office Directory, they are able to suggest the locality and habits of the owner of the coat.

In *Echo of a Mutiny*⁶, Thorndyke examines the hair surrounding and within a wound in the scalp of a corpse, and identifies parts of the shell of the acorn barnacle (*Balanus*



Fig.1. Dr Richard Austin Freeman.

balanoides (L)), and of the tubes of *Serpula vermicularis* L. and infers that the head struck an object periodically submerged - such as a rock or a beacon. There is also a description of mole hairs, "zig-zag shape and a flat end like the blade of a paddle".

In *The Old Lag*⁹ we find ourselves at London Zoo with Thorndyke and Jervis - ostensibly looking for the fish *Periophthalmus Költreuteri* (!) and later standing looking at a camel - giving Jervis the feeling that this is no casual visit. Thorndyke is interested: "Behold the ship of the desert, with raised saloon deck amidships, fitted internally with watertight compartments and displaying the effects of rheumatoid arthritis in his starboard hip-joint. Let us go and examine him before he hauls into dock". The camel had torn the skin of its leg on a nail in the enclosure and a man visiting the zoo with his little boy proffered his clean handkerchief to stop the bleeding. This man, who had been in prison ("the old lag") was later accused of a murder, his finger-prints being found at the scene of the crime. Later, Thorndyke proved that the finger-prints were indeed those of the accused man, but had been counterfeited by an ex-warder, using

either rubber or gelatine stamps (as in *The Red Thumb Mark*), and Jervis, examining a blood-stained garment, found that the blood was that of the camel – the only mammal to have elliptical erythrocytes: these facts were sufficient to exonerate “the old lag”. While at the zoo, however, Thorndyke was seen to gather hairs and feathers for his collecting box. “You never know”, said he “when a specimen for comparison may be of crucial importance: here, for example is a small feather from a cassowary, and here the hair of a wapiti deer”. He went on to say “I have probably the largest collection of hairs in the world and other microscopical objects of medico-legal interest. The microscope is the sheet anchor of the medical jurist”.



Fig.2. Dr John Evelyn Thorndyke. Almost certainly drawn by R.A.F.

In *The Naturalist at Law*¹⁰, a body is found in a ditch in which there is a good deal of duck-weed, and duck-weed and water is found in the stomach and lungs at post-mortem: at the inquest a verdict of death by drowning is returned. The dead man’s brother calls on Thorndyke to examine the body, and he finds that there is a tuft of water-weed grasped in one hand in addition to that found in the stomach contents. When Thorndyke visits the place where the body was found and there finds duck-weed and the common ambershell – *Succinea putris*, he remarks; “Just a simple oval disc with a single root hanging down into the water – a complete plant and a flowering plant too!”. Later, from a used railway ticket found on the body, he and Jervis go to the destination on the ticket. Thorndyke carries a vasculum and after some discussion with the stationmaster the two friends walk along a road leading to a factory. Thorndyke pauses beside a ditch full of pond-weed. “Duck-weed, horn-weed, *Planorbis nautilus* but no succiniae”, he remarks. Jervis points out that there is horn-weed, whereas there

was no horn-weed where the victim was found and Thorndyke, fishing with a shrimping-net, finds a small dental plate, known to have been worn by the dead man. Everything points to murder, of course – the wrong duck-weed and the dental plate, the body having been transported to the other ditch. Thorndyke reviews the evidence: “Parton’s evidence at the inquest proved that Cyrus Pedley was drowned in water which contained duck-weed: we saw the duck-weed and two *Planorbis* shells. These two shells proved that the water in which he was drowned must have swarmed with them. We saw the body and observed that one hand grasped a wisp of horn-weed. Then we went to the ditch and examined it. The ditch was covered with duck-weed as we expected but it was the wrong duck-weed! There are four British species of duck-weed: the Greater Duck-weed, the Lesser Duck-weed, the Thick Duck-weed and the Ivy-leaved Duck-weed. Now the specimens in the stomach contents were the Greater Duck-weed, easily distinguished by its roots which are multiple and form a tassel, but the duck-weed on the other ditch was the Lesser Duck-weed, which has only a single root: it is impossible to mistake one for the other”.

In *The Cat’s Eye*¹¹ we are introduced to *Echidna hystrix*, the Spiny or Porcupine Anteater, of which one of the cervical vertebrae formed a watch-chain mascot, and there is a complete description of the vertebra – its transitional form showing the well-marked reptilian characteristics, though a mammal: the transverse processes joined to the rest of the bone by sutures. Later in the story Freeman gives a good description of Marsh’s and Reinsch’s tests for arsenic taken from some poisoned chocolates – well-detailed and thorough. Then there is the description of the effect of cobalt poisoning, in which the hair of a blond woman sentenced to work in the cobalt mines of the Hartz Mountains was examined. The hair was black in appearance, but blue when seen under the microscope, and there are three pages of very relevant facts and their importance demonstrated by Thorndyke. *The Cat’s Eye* is, to me, the most exciting, the most romantic and the most detailed story of them all, and I have read it many times: a perfect savant’s bedside book!

*A Message from the Deep Sea*¹² concerns the murder of a young Jewess in her bed in the east end of London. The pillow on which her head is resting is covered with what looks like silver sand, and her throat has been cut savagely. Thorndyke takes a sample of the sand in one of his seed envelopes and finds it to consist of Foraminifera – “A message from the deep sea, Jervis, from the floor of the Eastern Mediterranean”. In the Coroner’s Court, Thorndyke explains that the species of Foraminifera in the sand are found only in the Levant, from where sponges are gathered for use in the bath. These sponges contain sand which is removed by packers in the warehouse and it is present in such quantities that the mens’ clothing becomes saturated with it and it lies ankle-deep on the floor: on reaching over the bed-head to commit the murder, the sand fell on to the pillow. Together with other evidence, this leads to the discovery and arrest of the criminal.

*A Fisher of Men*¹³ provides more interest for the naturalist in a story about a diamond robbery, which eventually brings Thorndyke and his friend Jervis to the tow-path on the right-hand bank of the Thames at Hammersmith; they had previously been examining the contents of a leather handbag, containing, among some very dirty clothing, implements of the burglar’s trade, and a tussock of grass. Looking through

the grass, Thorndyke finds a tiny elongated shell, and identifies it as a species of mollusc – in fact *Clausilia biplicata*. Together with other evidence, including a walking stick bearing a ‘Blakey’ boot stud, and the discovery that a turf of grass had been cut out of the sward, Thorndyke finds the case containing the diamonds beside two small holes made by a walking-stick, plaster casts of which reveal the ferrule with the Blakey boot stud. The villains are arrested. Thorndyke explains that the fact which led him to Hammersmith, and the tow-path in particular was the little shell. “There are four British species of *Clausilia*”, said Thorndyke, “*Clausilia laminata*, *C. rolphil*, *C. rugosa* and *C. biplicata*. The first three have what we might call a normal distribution, whereas the distribution of *C. biplicata* is abnormal: it has disappeared from this country with the exception of two localities; one of these is in Wiltshire and the other is the right bank of the Thames at Hammersmith – and this latter locality is extraordinarily restricted. Walk down a few hundred yards towards Putney and you have walked out of its domain; walk up a few hundred yards towards the bridge and again you have walked out of its territory. Yet within that little area it is fairly plentiful. It usually lives on the bark or at the roots of willow trees – the stick showed marks of having been stuck in the ground for about three inches in soil similar to that on the bag: what we had to look for was a hole in the ground about three inches deep, having at the bottom the impression of a boot stud, close to a willow”.

From this survey I hope that it may be seen that Thorndyke, through his collection of mounted specimens of all kinds, his contacts with colleagues in various medical and scientific institutions, his own very wide knowledge and scholarship and above all, brilliant legal mind is much more than the usual fictional detective, but is made to live through the brilliance of his creator, Dr Richard Austin Freeman to whom I am grateful in many ways; for his friendship, for the gifts of many of his books, for the welcome to his house at Gravesend and his encouragement. I offer this tribute to his memory.

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NOTE. *The Man with the Nailed Shoes* and *The Mandarin's Pearl* only appear in the undated volume *John Thorndyke's Cases*. I do not know how many of Freeman's books are still in print, but several have been printed by Lythway Press Ltd, Bath, by arrangement with Hodder and Stoughton Ltd, London, by whom all Freeman's work was originally published, as in the references given above.

G.Y. KENNEDY.

Mistletoe, Myth And Magic

Viscum album, mistletoe, mistiltan, as in missell-thrush and tan meaning a twig in OE, is to be found throughout the southern counties of England, but not near the sea, and most profusely in Herefordshire. The preferred host of this parasitic plant with light green bark, 'popinjay' colour, olive-brown leaves and yellow-green flowers, is the apple tree, but it can also be found on poplars, willows, limes, hawthorns, rowans and other trees; it rarely grows on oaks and very seldom on pear trees. The Celtic word for mistletoe is gue or guy, and to this day the French name for the plant is gui. There are more than twenty species in the world but the only native of Europe is the mistletoe proper, which belongs to three physiologically distinct species, alike in appearance but needing different hosts. The plant is propagated by birds eating the berries, wiping their beaks on the bough, and leaving the seeds to grow into a sucker root and penetrate the bark. Birdlime is made from the glutinous fruit.

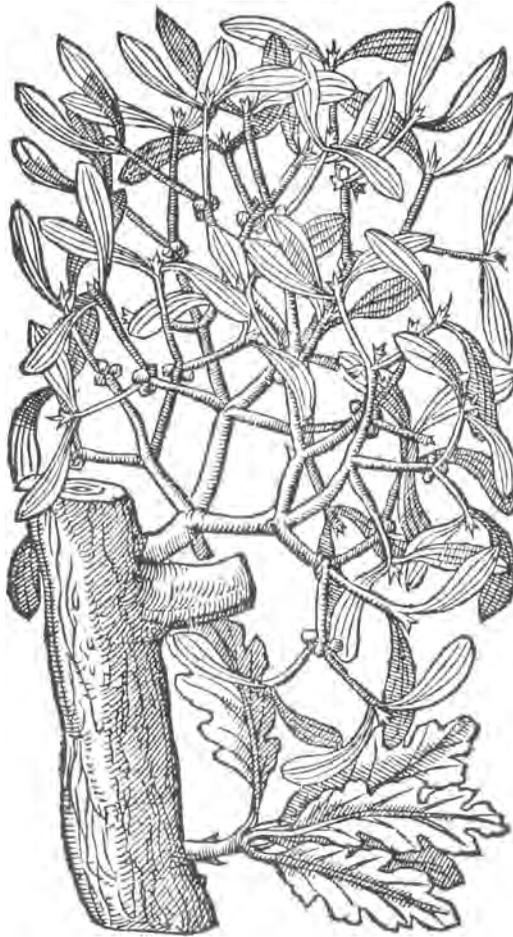
From time immemorial mistletoe has been an object of superstitious veneration in Europe and worshipped by the Druids in Gaul and Britain. Their priests, dressed in white robes, climbed the oaks, cut the bushy plant with a golden hook, and threw it on to a white cloth, as it would lose its magic powers if it touched the ground. The fact that the oak was deciduous and the mistletoe evergreen, made it even more sacred in the eyes of these tree-worshippers. Some anthropologists considered mistletoe to be the origin of the Golden Bough because of the rich golden colour of the dried plant. There was a theory that the mistletoe of the Druids was an allied parasitic plant, *Loranthus europaeus*, which unlike *Viscum album*, was commonly found in Southern Europe, growing on oaks; it was thought that this mistletoe was totally eradicated when Druidism was suppressed by the Romans, and the sacred groves of oak cut down.

Many countries have legends relating to mistletoe. According to Virgil, Aeneas carried a branch of mistletoe to light him in the underworld; while legend has it that, after Jupiter descended from heaven, he resided in a mistletoe bush. Medea concocted magic potions from the berries. And in Scandinavian mythology, Baldur, son of Odin, was finally slain by other Norse gods with an arrow made from the wood of mistletoe.

This 'supernatural' plant was greatly prized for its curative properties and was called the All-healer in many languages. Moving from legend to history, Pliny wrote that the best mistletoe grew on oaks and was effective in putting out fires. Both in Switzerland and Sweden the plant was brought down with arrows or stones and caught in mid-air. If it was gathered at either the winter or the summer solstice its magic powers were doubled. It was universally used as a cure for epilepsy, the reasoning being that the mistletoe is rooted in the branches and cannot fall, neither could the patient with falling sickness. Culpepper wrote: 'some have called it... *lignum sanctae crucis*, wood of the holy cross, as it cures falling sickness, apoplexy and palsy, very speedily'. In England it was still being used in the reign of George I. The Aino people of Japan went so far as to use it for every disease, and even planted the leaves with the millet to increase the crop.

The Germans hung it round the neck and used divining rods of the wood in order to see ghosts and to speak to them. It was considered a powerful protection against

1 *Viscum*.
Miffeltoe.



From Johnson's 1636 edition of Gerarde: The Herbal, 1636.

witchcraft, and in Wales and northern England a bunch of mistletoe was given to the first cow that calved after New Year's Day, and then the dairy herd would thrive throughout the year. In Austria it was sufficient to lay a twig on the threshold as a protection against nightmares. In Africa the leaves were carried by warriors as talismans. It was universally used as an antidote to poison.

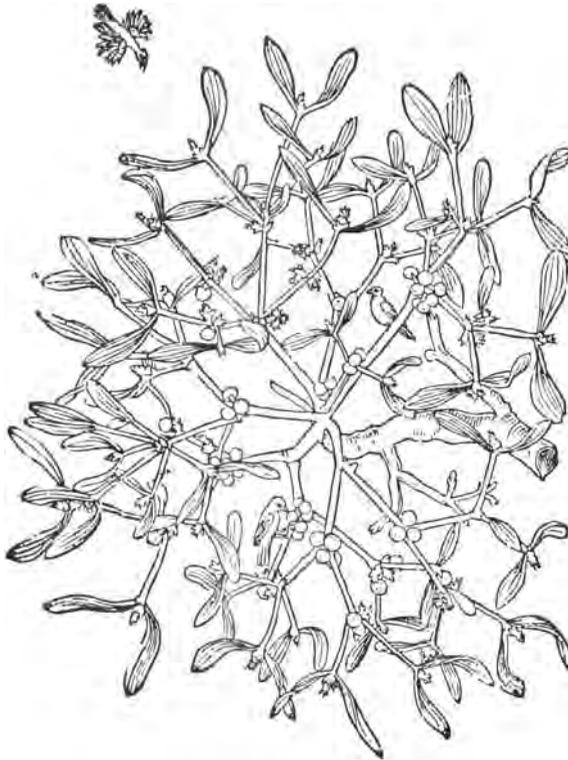
In a book of Floral Emblems, published in 1825 and explaining the language of flowers, the mistletoe, which is drawn suspended on the tree, was the symbol for a flattering hanger-on.

Mistletoe was not allowed in the church at Christmas because of its association with merriment and debauchery, and would not lead to pious devotion. Its connection with the Druids and their human sacrifices would also make it unsuitable. Its use was thought to increase fertility in the home and the farmyard. The custom of kissing under

the mistletoe bough at Christmas dates from the early part of the seventeenth century. This could have derived from the Roman Saturnalia, a period of general licence, or from the dedication of the plant to the goddess Friga, the Venus of the Saxons. Originally the correct procedure was for the man to pluck a berry after kissing a girl, and when the last berry had gone, there was to be no more kissing. Although this custom would no longer be popular in England, most homes still have a bough hanging in the hall. The Linnean Fellows, of course, will carry on the tradition and be able to botanise too.

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David Thomas Gwynne-Vaughan, 1871-1915

A.D. BONEY

Department of Botany, University of Glasgow, Glasgow G12 8QQ

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INTRODUCTION

The death of David Thomas Gwynne-Vaughan in the late evening of Saturday, 4 September 1915, at the age of 44 years came as an unexpected and severe shock to a wide circle of botanists in Britain and overseas. He had been appointed to the Chair of Botany of University College, Reading just over twelve months before. His first academic session there had been completed against a background of ill health, especially recurring bouts of 'my old enemy neuritis.' The cause of his death was tuberculosis of the lung, which had proceeded at a rapid rate through the summer months (a case of 'galloping consumption' in the colloquial terminology of the time). By his own request the serious nature of his illness had been known only to his wife and a small number of close associates. These included F.O. Bower, Regius Professor of Botany at Glasgow University, and W.H. Lang, Barker Professor of Cryptogamic Botany at Manchester University. With Gwynne-Vaughan, these two constituted the 'triumvirate' of their mutual correspondence, stemming from an earlier association at Glasgow from 1896-1907. Robert Kidstoll of Stirling, the distinguished palaeobotanist, with whom Gwynne-Vaughan had collaborated in his last major research programme, would have been one of the few outside of the 'triumvirate' to be kept fully informed of the course of the illness. The funeral was at Golders Green Crematorium on the morning of Wednesday, 8 September. On that same morning the session of Section K (Botany) of the British Association for the Advancement of Science (BAAS) meeting at Manchester was suspended as a mark of respect to one who had been a regular participant, and its Secretary (1901, 1909-11) and Recorder (1912-13). A fitting tribute for another reason. It was as a direct result of his participation in a Section K meeting at Liverpool in 1896 that Gwynne-Vaughan's academic career in Botany began.

FORMATIVE YEARS

D.T. Gwynne-Vaughan was born on 12 March 1871 at Royston House, Llandoverly, the home of his maternal grandparents. He was the eldest child of Thomas Gwynne-Vaughan of Cynghody, and later of Erwood Hall in Breconshire, and

Elizabeth, daughter of David Thomas of Royston House. Elizabeth Gwynne-Vaughan died in 1874, Thomas Gwynne-Vaughan remarried, and there were two daughters and a son of this marriage. The Vaughans were an ancient Welsh family, claiming descent from Sir Roger Vaughan, one of three Welsh officers who were knighted for valour by Henry V whilst they lay dying on the field of Agincourt. Back in the mists of Welsh history there were said to be ancestral links with Cradog the Strong Arm, one of the Knights of the Round Table. The Gwynnes claimed a common ancestor with the Vaughans in Aulach, great-grandfather of Cradog, and in turn a descendant of Gwarldag, King of Garthmadyrn (now Breconshire) about 250 A.D.¹ Hence D.T. Gwynne-Vaughan was the scion of a landed Welsh family, and remained quietly proud of his national origins. He was familiar with the Welsh language. An ancestor with some scientific leanings was Thomas Vaughan (1622–66), B.A. of Jesus College Oxford. A colourful character, he had served in the King's army during the Civil War. He became a priest but was later de-frocked. He was an alchemist, poet and philosopher, and was wrongly assumed to have been a Rosicrucian. He died from mercury vapour poisoning following some extensive experiments with the element. From what we know of Gwynne-Vaughan's interest in people and his sense of humour, he would surely have treasured such an ancestral link.

After preparatory school in Kington, Gwynne-Vaughan's main schooling was at Monmouth Grammar School. A school exhibition enabled him to enter Christ's College, Cambridge, in 1890, and he was awarded a College science scholarship in his second year. As a budding botanist he would have appreciated being a member of Charles Darwin's College. In 1893 he was awarded a first class in Part I of the Natural Science Tripos, and then left to become a science master in a school. During his residence at Cambridge the long tenure of the Chair of Botany by Charles Cardale Babington was approaching its end. Babington was taken ill whilst on holiday in the Highlands in September 1891, and went into semi-retirement on his return to Cambridge.² The teaching of Botany at Cambridge under Babington had been in the doldrums for many years (F.O. Bower, then a pensioner at Trinity College from 1874–77, later described it as being 'moribund in the summer and actually dead in the winter'³). Gwynne-Vaughan was fortunate to be in residence when the teaching had undergone considerable rejuvenation, first by S.H. Vines, appointed Lecturer in 1876 and Fellow of Christ's College. Vines had brought the 'New Botany' – the experimental laboratory approach – to Cambridge. Vines left in 1888 for the Sherardian Chair of Botany at Oxford. Francis Darwin, 7th child and 3rd son of Charles Darwin had been appointed Fellow of Christ's College and Lecturer in Botany in 1884, and Reader in Botany 1888–1904. Darwin was also a protagonist of the experimental approach. To some extent Gwynne-Vaughan missed out somewhat on a complete university career by not staying on for Part II of the Tripos, but he would have had a fuller and more lively experience of Botany than that obtained by Bower.

Schoolmastering did not prove an attractive career prospect. Gwynne-Vaughan fortunately came to the attention of W.T. Thiselton-Dyer, Director of Kew Gardens, who in 1894 invited him to work in the Jodrell Laboratory in the Gardens. The laboratory at that time was under the Honorary Keepership of D.H. Scott. The Jodrell Laboratory had been built in 1876 at a cost of about £1500, including equipment,

through the generosity of T.J.P. Jodrell, at the instigation of his friend, Joseph Dalton Hooker, then Director of Kew Gardens. The laboratory was specifically to promote the study of the anatomy and physiology of plants. The laboratory quickly became a centre for the researches of young botanists, and their names are a roll call of leading scientists of later years.⁴ Gwynne-Vaughan was fortunate to receive his research training from D.H. Scott. Scott, son of Sir George Gilbert Scott, the distinguished architect, had been interested in Botany from childhood, but had trained as an engineer. Turning again to Botany, he had joined Sachs's laboratory at Würzburg in 1880 on the advice of Thiselton-Dyer, and in 1882 was awarded a PhD for research on lactiferous vessels in plants. To have studied under one of the master botanists of all time would have influenced one's research for a lifetime. The steady stream of young British botanists studying at Würzburg and other laboratories in Germany in the latter years of the 19th century underlines Scott's comment of 1925, that for a young botanist of the time, the opportunity to study in Germany was '...like a pilgrimage to Mecca by a pious Mussulman.'⁴ Scott had come to work in the Jodrell Laboratory in 1882 on his return from Germany, joining F.O. Bower, then Lecturer in Botany at the Normal School of Science in South Kensington under T.H. Huxley, and W. Gardiner from Cambridge. The three made a profound impression on Thiselton-Dyer, then Assistant Director at Kew and in charge of the Jodrell Laboratory. As he commented to Bower in a letter in 1912, '...you were a fine team at Kew and the right stuff'.⁶

Under Scott's supervision Gwynne-Vaughan was to inherit indirectly something of the influence that Sachs exerted on all his pupils; the rigorous and critical examination of experimental material, and the meticulous recording of results, whether in writing or drawing. An influence which his protégés brought to their teaching well into the 20th century. Sachs was an acknowledged master of botanical drawing. Bower was to recall some 60 years on the advice he was given by Sachs on accurate draughtsmanship, namely '...every drawing conveys a view' and 'no one has really seen an object until he has drawn it'. (Aphorisms which are as true today for botanical laboratory classes as when they were stated to Bower in 1877).

Gwynne-Vaughan settled at his bench in the Jodrell Laboratory in early October 1894. His first project was an anatomical study of *Pandanus* roots, followed by some observations on Cycads, and joining others in the laboratory in an enthusiastic search for centrosomes. Already his main interests were centred on plant anatomy, and he early showed his ability at hand-sectioning and staining, and accurately recording his observations with meticulous drawings. His research programme became more stabilised in January 1895. His first major project was an anatomical study of representatives of the Nymphaeaceae, including an examination of the seedlings of *Victoria regia* which had just become available. In the following May he commenced on an investigation of polystelic *Primula* spp. Both the Nymphaeaceae and *Primula* researches were reported in brief papers in the *Annals of Botany* in 1896. The two major papers on the subjects were to appear in 1897, the *Primula* study in *Annals of Botany* in June 1897, and the Nymphaeaceae investigation in *Transactions of the Linnean Society* in October 1897, the latter including an acknowledgement of the 'valuable advice and supervision' of D.H. Scott. One of the short papers published in 1896 was an abstract of the paper he delivered at the 1896 meeting of the BAAS at

Liverpool. Gwynne-Vaughan had attended the 1895 meeting of the BAAS at Ipswich, but without making any contribution at the meeting (the first one in which Botany was represented as a separate Section K). Whilst Gwynne-Vaughan read his paper at the Liverpool meeting, one member of the audience was considerably impressed. In F.O. Bower's own words, it was evident that both a new investigator and a new teacher had arrived. Bower then acted somewhat out of character. After congratulating Gwynne-Vaughan on his paper, he immediately offered him an appointment as an Assistant in the Glasgow Botany Department. An event seemingly out of character, for Bower was never one to make any sudden move over an important decision. However, Bower and Scott were close friends and there had probably been some earlier correspondence. This is further indicated by the minutes of the Glasgow University Senate meeting of 22 October 1896, in which approval was recorded for the appointments of two Assistants to Bower, W.H. Lang (salary £150) and D.T. Gwynne-Vaughan (salary £50). Such a formal approval within a few weeks of Gwynne-Vaughan's Liverpool paper rather suggests that Bower had made some preliminary arrangements beforehand with the Clerk of Senate.

William Henry Lang's academic pedigree was very different from Gwynne-Vaughan's. As described in the students' magazine when Lang left Glasgow in 1911 for the Barker Chair of Cryptogamic Botany at Manchester University, 'he was Glasgow through and through'. Lang entered Glasgow University from Dennistoun School at 16 years of age in 1889 to read Medicine. In the summer of 1890 he attended Bower's lectures for medical students, and thereafter kept up his interests in both science and medicine, graduating B.Sc in Botany and Zoology in 1894, and M.B. and C.M. in the following year. He never entered medical practice, and was appointed Assistant to Bower in 1894. He met Gwynne-Vaughan in October 1895, when he went to work at the Jodrell Laboratory. With kindred botanical interests there was an immediate rapport between them and the beginning of a lifelong friendship. It was an association of opposites. Lang of somewhat serious disposition – according to one student at Glasgow in the 1900s, '...looking like an apostle;'⁹ Gwynne-Vaughan the taller, the more outgoing, and with a whimsical sense of humour which frequently bubbled to the surface, irrespective of the company present. Lang, in spending part of the academic session working at the Jodrell Laboratory was not only following in Bower's footsteps before and after he was appointed to the Glasgow Chair in 1885, but was doing so with the latter's active encouragement. The accommodation for Botany at Glasgow in 1885 was meagre – as Bower was to describe it, '...a thing of threads and patches'. His predecessor in office, Isaac Bayley Balfour, had, soon after appointment in 1879, 'bartered' the Botany lecture room (then the only accommodation) for two rooms on the ground floor, the larger to be used as a teaching laboratory, the adjoining smaller one opening off it as the Professor's preparation and research room. For his lectures, Balfour borrowed a room from the professor in the Arts Faculty, whose lectures were confined to the winter months. Balfour's move was a pre-emptive one – to build up a worthwhile case for more adequate accommodation. But when he left Glasgow in 1884 for the Sherardian Chair of Botany at Oxford his plans had not reached anything like completion. The two rooms became Bower's inheritance, plus an attic for the unsatisfactory storage of herbarium material. Each

year Bower also had to borrow a lecture room for his summer session of lectures. This spatial problem was to remain unresolved for some 16 years. There would have been little space for more than one person to carry out research, and hence encouragement for Lang to work at Kew. Following his Glasgow appointment Gwynne-Vaughan remained at Kew until the end of the year, clearing up his work and finalising the papers on the Nymphaeaceae and the polystelic *Primula* spp.

Gwynne-Vaughan's publication record shows a gap of four years between his 1897 Nymphaeaceae paper and the next one on the fern *Loxsonia*. This might well be due in part to the pressures of teaching as well as accommodation problems. Despite the inadequacies of space, the Professor and his associates formed a team built on mutual respect. Between themselves, and with other colleagues, the three became known as the 'triumvirate'. The two Assistants referred to Bower as the 'Chief' – a title constantly used in their correspondence in later years when they were both professors. In the late 1920s, Bower's successor in the Glasgow Chair, J.M. Drummond, was known in the Department as the 'Young Chief' by his colleagues; Bower, when on occasional visits to the Department from his retirement home in Ripon, was the 'Old Chief'.¹⁰ Bower not only encouraged his assistants to keep up their research programmes, but also gave them the opportunity and support to travel abroad to see different floras and to collect research material. This was a direct result of his own first major trip abroad in the winter and spring 1885–6, when, to his surprise, he discovered that his only teaching requirement at Glasgow was during the summer session. He spent the time in Ceylon, although, as he later admitted, without enough of a set purpose to gain any real advantage research-wise from the trip. Gwynne-Vaughan was to take advantage of this encouragement twice between 1897 and 1900.

'WANDERSCHAFT'

Since they were briefly separated in time it is convenient to describe in succession the two overseas expeditions by Gwynne-Vaughan. He entered into his Glasgow appointment in January 1897. The settling in process and the heavy summer teaching programme would have left little time for any research had space been available. He would have found the Glasgow students somewhat different from his previous experience of such a body in his Cambridge days. As stated by Bower in his inaugural address to the Medical Faculty in October 1885, they were '...in real earnest' – a statement much appreciated by the lively student assemblage. As Bower had found from his first series of lectures in the previous summer, the students had '...clear-cut and well-mapped out intentions' when compared with students at Oxford and Cambridge.¹¹ The 1896–7 session would have included courses for students studying Botany for the M.A. and B.Sc degrees, as well as the sizeable number of medical students working for their first professional examination. In the autumn of 1897 Gwynne-Vaughan was granted leave of absence (without pay) by the University to embark on his first major expedition abroad.

Gwynne-Vaughan had received some approaches from a commercial syndicate in May 1895 to explore the hinterland of Brazil with a view to assessing the potential for rubber production. In 1897 this syndicate commissioned him to carry out the undertaking, some 2500 miles from the mouth of the Amazon to its junction with the

river Solimoes, and then along the two tributaries of the latter, the Purus and the Juruà, about 250 miles from the Colombian border. Since this was commissioned work there was no opportunity for any scientific fall-out. He was required to assess the numbers of rubber trees suitable for exploitation.

Gwynne-Vaughan kept up a desultory correspondence with his half-sister, Miss A.G. Gwynne-Vaughan. She in turn collected together typewritten copies of the more notable extracts, and in 1918 sent to copies to Bower at Glasgow.¹² The starting point for the expedition was the town of Para, about 100 miles south of the main mouth of the Amazon, and on a branch of the main river. In his first letter, dated 4.12.97., Gwynne-Vaughan occasionally shows a flair for descriptive writing similar to that of the young Charles Darwin in describing his first experiences in a tropical forest. By now Gwynne-Vaughan was some 600 miles from Para, and heading upstream to the next stopping point, Manaus, about 1000 miles from Para.

....Between Obidos and Serpa

'...The temperature day and night varies between 85° and 95°, and it is well over 90° at present. I am on board a river steamer and rapidly ascending the Amazon. I am writing this as I lie in my 'rede', a sort of sleeping hammock; it is slung on the deck because sleeping in a bunk is almost impossible...Here I am on the Amazon, 5 miles broad at this spot, within 1° of the Equator, and watching the tropical electric display which every now and then silently and unexpectedly illuminates a distant bank of clouds, whilst the moon makes wonderful perspectives on the waters of this amazing river. It is not altogether easy work writing in a 'rede', to say nothing of the constant interruptions caused by the necessity of slapping off a mosquito. The Amazonian 'skeeters' are renowned for their virulence and size, and for strict attention to business they beat the ant into a cocked hat. In daytime they are relieved by a larger and more horrid looking insect, called *motuca*, who carries on the persecution with praiseworthy persistence. There is a curious company aboard, only three English, the rest Brazilians, half-breeds, etc... Today a set of us were talking. I who speak English and a little French, a French Count who speaks French and Portuguese, a Brazilian who speaks Portuguese, and an Italian who speaks Portuguese and a little English. You may work out how we got on, if you have any time on your hands. I have stayed a little time in Brazil, at the city of Para, which is a most unique and interesting town. But this journey up the Amazon is the most fascinating thing I have yet experienced. In parts we steam along, a biscuit toss from the margin of the stream, which is bordered on either side by a solid wall, 60 feet high, of virgin impenetrable forest of the most luxuriant tropical vegetation. Palms of various kinds stand out in delicate relief against the darker mass of giant trees of India rubber, Mimosae, Bertholettia etc.,etc., and the very water's margin is crowded with gigantic plants of the Arum family, reaching up to 20ft high. It is vain to attempt to describe the positively wanton prodigality of nature in these regions, still most of the forest is 2-6ft, sunk in water for the extent of many miles on either side of the free stream. I am getting on wonderfully well ... still feel fairly fit ...the greatest worry I have to deal with is the language. No one can scrape up even a glimmer of a new tongue in three weeks, at least I can't. Portuguese is perfectly idiotic, it positively goes in for every tense that the Latin had, and a few more of its

own, and this at the end of the 19th century too! How on earth I shall get on later I don't know, as it is I have had to leave half of my kit at Para, owing to the hopeless incapacity and remarkable depth of crass ignorance in which the Customs authorities are steeped. They won't do a thing here without thinking it over for a week first, and every other day is a 'fiesta' of some Saint or other, and no work is done ...oh! those Customs!!!!

From Manaus

...Since writing the last instalment I have reached Manaus. The farthest outpost of civilisation (save the mark!). From here we are going to make a couple of expeditions up the little known rivers of Purus and Jurà, and the serious work of the trip begins. Although I fear we will be delayed here several days before we complete our preparations. Hitherto all has been plain sailing and there is nothing inconvenient here save the mosquitoes which have become poisonous, and the intense heat, which has a most enervating effectI am also grieved to find that Manaus is indulging in a more than usual debauch of Malarial fever. The town is a very pretty one and is situated about five miles from the Amazon, on the River Negro. It is thoroughly tropical in all respects – different from anything conceivable in a temperate region. Every common weed in the streets is completely new to me and the size and beauty of the flowers in the waste places are impressive, every one new to me, and I am feeling very confused with it all, when I think that a wealth of the Virgin Forest has yet to be encountered. I have been endeavouring to replace my lost kit here, but with little success and great worry, but if there is one time when you want to be a strong fatalist it is when travelling in Brazil. I am slowly getting used to it. It is altogether a country of the palpably impossible and the openly absurd.

I am sending this letter off by mail which will probably go round by New York. But whether it will get past the first Post Office is a matter of serious doubt, the office is paved with fallen and forgotten letters. I have already got very tired of stopping here and am anxious to start off again. I ought to write an interesting letter from a place like this, but find I am unable to. It is perfectly useless to start on the various features, they are so many and I can't hit upon anything that will give a fair and adequate impression of the place....'

Gwynne-Vaughan arrived back in England on 16 September 1898. He rounded off his account of the Brazil trip in a letter from the Jodrell Laboratory:

'...I've managed to get through it all rightsome 2500 miles into Brazil and right away back to the starting point....For a description of the journey along thousands of miles of river flanked on either side by ancient forest over 100 feet high, the strange beasts in the water and on land, the occasional settlements we met with and their inhabitants, the Indians almost white and quite pleasant fellows that we came across, the miles I have walked in half-flooded damp and heated 'Capo' or low-lying forest, with the thermometer at 90° in the shade, alone with a single Indian guide and a flask of the local '40 rod exterminator'; of all these anon – of snakes and sun – but as Rudyard would remark 'that's another story'...These I must keep until the fortunate hour in which we next meet.

Myself and my companion were travelling against time, so I'm sorry to say my botanical results were only meagre, and I am haunted by an appropriate quotation.

'Ah, fool was I and blind;
The worst I stored with *utter toil*,
The best I left behind'.

Gwynne-Vaughan remained at Kew until 3 January 1899. His appointment as Junior Assistant had been renewed the previous October, as had Lang's Senior Assistantship, both at the same salaries of £50 and £150 respectively. But once again Gwynne-Vaughan was granted leave of absence (without salary) to join another overseas expedition, this time a scientific one from Cambridge. The leader was W.W. Skeat, whose surname subsequently became the title of the expedition. In addition to Gwynne-Vaughan there were two other members; Annandale, from Edinburgh, with a specialist interest in arachnids and snakes; Evans, from Cambridge, Welsh-born, a specialist on sponges, but with some ethnological interests. The expedition was to be centred on the Malay Peninsula. Skeat came from an army background, and had served as a District Commissioner in the area, and had a good knowledge of the Malay language, and familiarity with the natives and their customs. He was to be responsible for recruiting the Malay bearers. The party was originally to be joined by a fifth member at Singapore; Bedford, originally of King's College, London, and a marine biologist, but he failed to join. The area to be studied was a little known region lying south of what is now Thailand, and north of what was then the protected States of Malaya. Three districts on the east side were the main areas, namely Kelantan, Pattari and Trenganu.

On the Skeat expedition Gwynne-Vaughan again maintained an intermittent correspondence with Miss Gwynne-Vaughan and with W.H. Lang. His half-sister again forwarded typewritten extracts to Bower, and the letters sent to Lang are in the Glasgow University Botany Department archives.¹³ Each lengthy letter was composed of a series of instalments, so that the date at the letter head bore no relation to its date of completion, or of despatch, especially when written in the hinterland of the area under investigation.

The early letters give a fair indication that the future was being faced with some trepidation, notably because of the relative inexperience of his colleagues, the haste with which the whole affair had been mounted, and the relative inadequacies of the financial provisions. His first letter to Lang was dated 15 February 1899, and written whilst the ship was proceeding through the Straits of Messina *en route* to Singapore, and posted later at Port Said: '...Here we are you observe and no preparations – no mechanics. Oh no! not at all – I was ready to the second and we started up on time. Myself, Skeat, Annandale (from Edinburgh) Evans (an Italian!) (with a pronounced brogue). I will pass over the horrible details of the preparations and all the despairing moments that accompany an attempt to accomplish the impossible still I started with a distinct majority of the goods that I intended to start with and what is more I've got 'em all with me so far.

'The journey across Europe was *awful*. Almost 50–60 hours continuous travelling in 2nd class carriages with Frenchies *packed* like herrings. Imagine a night mail from Glasgow to London all full intensified 5 times! – couple with it indifferent nutriment

en route. This show carries carefulness in expenditure to a ludicrous extent. It may be magnificent but it is *not* war! I positively bar being a martyr to science or anything else, and I'll be jiggered if I can see the use of starving oneself before it is absolutely necessary. I thank the Lord that I have taken the precaution of getting myself well heeled for the trip and have also a comfortable letter of credit on to Bangkok, – it will cost me a year's income this job....!

His three companions came under scrutiny for Lang's benefit. Skeat 'still a very nice chap (but I await developments).' Evans, about 38 years old, of short stature 'very Welch ...silent, dubious, but probably staunch'. Annandale, in contrast, 'thin, delicate-looking with a distinct academic stoop ...not very brilliant looking, but possibly clever, distinctly enthusiastic, may turn out to be a fairly decent chap'. Gwynne-Vaughan was also impressed by Skeat's Malay servant, Hadji Sirah 'a nice little man who I am beginning to like, a big man in his own way having been to Mecca (hence the Hadji)'. Of the expedition as a whole he was still somewhat apprehensive – '...I have never heard of a more heterogeneous scratchy lot in my life, and when I look at the 'Expedition' in a row, I want to laugh, we look as though we'd escaped from Barnum – Lord only knows what will become of us in the end. I seem to be the only one who has a clear conception of the 'devil's own time' we are almost bound to have'.

Gwynne-Vaughan had set himself the task of learning as much Malay as possible on the voyage, an undertaking that was an 'absolute necessity'. He hoped to obtain some grounding within a month. Meanwhile life aboard ship was bearable, just, with 'most curious French menus for dinner and meals at the weirdest hours'. Some of the passengers he found overbearing – especially some officers of 'La belle Armée'. He remained worried about the staying powers of his colleagues under stress – 'I have repented this departure 4 or 5 times already in sackcloth and as sure as I am here the ashes are going to be prepared for me bye and bye.....having put the hand to the plough I'm going clean through with whatever turns up!' The anxieties and rush of the preparation and the unpleasant rail journey was fading due to the recuperative effects of 'my old love the sea is soothing me by degrees'. He still regarded himself as being in an 'anomalous position – as usual. There is no hole that this peg will not fit at least not without a lot of twisting and turning'.

A letter to his half-sister dated 22 February 1899 written at Ismailia in the Suez Canal covered much the same ground as the letter to Lang. He had more to say about the Malay language – '...there is no grammar to talk of, only customary forms of diction so to speak, and you work with 'root ideas'. I like the pronunciation, which suits a Welshman.' He was finding Hadji Sirah a valuable help in this learning process. There were 8 Britishers in the one-hundred passengers who were '...reserved, self-contained and self-sufficient, although we hardly speak to each other yet (have only been on board a week). We stand out as a distinct set, patronisingly tolerant of the rest of the ship. I, as a Welshman, alone can note and appreciate the same. Verily we are a wonderful race'.

The next letter to Lang was undated and written whilst in passage across the Bay of Bengal. The ship had called at Colombo for a 6 hour stop, and Gwynne-Vaughan

had gone ashore to meet J.G. Willis, then the Director of the Peradinaya Botanic Gardens. Willis had been an Assistant to Bower at Glasgow in 1894 and Bower had spent his Ceylon visit in the winter of 1885–6 based mainly at the Botanic Gardens under its previous Director. Willis had given Gwynne-Vaughan an excellent dinner at the Hotel Oriental – ‘the first square meal I’ve had since I left England and probably the last until I return’. The meal had been accompanied by an intensive discussion on fern morphology, and the menu cards and tablecloth had been extensively decorated with diagrams of stelar structures. Gwynne-Vaughan was impressed by Willis’ drive and grasp of tropical Botany, and the laboratory he had built in the Gardens which he intended should be a major research centre. However, in 1911 Willis was dismissed from his post, having fallen foul of the Governor and other high officials. Fortunately for him the Directorship of the Rio de Janeiro Gardens soon became vacant, and he



Fig. 1. D.T.Gwynne-Vaughan in Singapore on the Skeat Expedition

moved to Brazil in 1912. The other members of the expedition were becoming more familiar. Skeat 'Rudyard Kipling', with a thorough command of the Malay language, sanguine, very clever, but 'somewhat imbued with red tape'. Annandale was tougher than his appearance suggested, self-reliant, and 'capable of great things'. Evans he admired for undertaking such an expedition without previous experience. But uncertainty about the organisational side of things remained, notably the essential planning of affairs after leaving Singapore. Two of the passengers, a Miss Orpen and her brother (a Colonel of Engineers serving in India) travelling home on leave, turned out to be cousins of Bower – an unexpected meeting. Gwynne-Vaughan was able to report that his health was satisfactory, other than an attack of asthma, a cough, toothache and a stomach disorder – 'but the sea always cures me of most things'. His struggles with the Malay language continued, and the letter concludes '...I still repent this expedition. I will assuredly suffer by it but it is some comfort that the expedition will suffer worse'.

The next letter to Miss Gwynne-Vaughan was dated 8 March, and headed 'approaching Singapore'. He referred again to the enjoyment of his meeting with Willis, and of Colombo 'it is the last of civilisation, henceforth savagery and 'carne secca' or its equivalent'. He was looking forward to reaching Singapore, but not to the amount of work to be faced there. A later brief addition headed 'Singapore' described the town as being 'most delightful'. His labours with the Malay language had proved beneficial – he had attended a play in the language that evening and had understood most of it. A letter dated 14 March followed, from the 'Oriental Hotel, Bangkok'. Bangkok he found 'a strange mixture of ancient and modern', modern street lighting and tramways side by side with 'life habits and customs of the savage past'. The party was to remain for one week in the capital, to be formally introduced to the Crown Prince amongst other events. The expedition proper was to commence with a journey some 400 miles down the coast to the town of Singora. He was beginning to enjoy life in the East - '...the East is placid, and it slowly insinuates itself into your whole system. You begin by admiring its gorgeous and well arranged colouring, its many and varied types of people, at this time its incongruities hurt you, but later you begin to like even these, and now I gaze in manifest delight upon a Chinaman with white coat, blue trousers, pigtail, a bowler hat, and good English'. The party was entertained to a full European style dinner by the Crown Prince and his family, the Prince in full evening dress. Gwynne-Vaughan had discussed the odds on the Varsity boat race with the Prince's younger brother, also a Cambridge man. Further local explorations had included a visit to the former capital, Aynthia, now deserted and slowly being engulfed by jungle growth, and his assistance at the worship of the ashes of Buddha in a golden pagoda in a temple so impressed the High Priest that Gwynne-Vaughan was invited to take tea with him afterwards. The nine Malays who were to be bearers were described. Respect for them was growing '...A proud and sensitive race – and natural gentlemen....It is true they have some excusable little eccentricities, such as running amok, and using their kris too freely, but then no race is altogether perfect'. The Malays found his double-barrelled name too difficult to manage, and he was dubbed Tuan Wong, which translated as 'Lord of Wealth' – 'a flattering enough title if not sarcastic'.

The next instalment, dated 'somewhere in April', was from the coastal town of Singora, reached by means of a small coastal vessel. From here Evans and Gwynne-Vaughan moved inland. Making their way to two inland seas, they were the first Europeans to set foot on the shore of one of these. Further inland they stayed in a native village, again the first Europeans to do so. Their meals and daily ablutions were carefully watched regularly by a semi-circle of some 70-100 villagers, who kept up a constant commentary amongst themselves – not least over the discovery that these strange visitors were white all over. Gwynne-Vaughan was the best shot in the party, and was constantly in demand to supply meat, and zoological specimens. On one occasion whilst in pursuit of an injured monkey he injured an eye on a projecting rotten twig, which caused some initial visual problems but not of a permanent nature. After 3 weeks they rejoined Skeat and Annandale at the home of a District Commissioner – a Malay. He daily entertained them with a succession of native dishes, much enjoyed by Gwynne-Vaughan, but less so by his colleagues. The daily collecting regime was an intensive one, often working continuously from 5am to 11pm. He described one Burke and Hare-like episode. The native custom of disposing of their dead was to wrap the corpses in skins and suspend them from trees in a sacred grove. Gwynne-Vaughan alone entered one such grove in darkness to remove 'one old gentleman' who was to be despatched to a museum 'somewhere back in England'.

The company moved south some 80 miles to the coastal town of Pattani. Evans was taken ill, and Skeat took him back to Singapore to be sent home. Gwynne-Vaughan thus set out on a path of exploration and collecting accompanied by a party of Malay bearers. One village was reached where '...most of the people were engaged in dying from Cholera of the fine crusted old 'Morbus' type'. They departed rapidly from its vicinity, with Gwynne-Vaughan being more concerned for the constitutional weaknesses of his Malay companions, and not for himself. He was accompanied on a number of excursions by a local 'villainous old brigand' who had decided that his company was essential to preserve Gwynne-Vaughan from all local demons. With this companion a series of large caves was explored, their walls laden with edible birds nests, and with stupendous stalactites and stalagmites. In one such cave he descended by rope 150 feet down a sloping pot hole in the floor, with only the 'brigand' guarding the tied end. At his lower level he lay on a spur of rock above a seemingly bottomless black pit, and decided to return to the surface as rapidly as fast climbing would allow, impressing the 'brigand' with the evil spirits which must reside down in the pit. Before entry into each cave the two stood at the entrance and chanted incantations to placate the various spirits resident within. Gwynne-Vaughan's incantation especially impressed his companion, consisting as it did of a recital in rhyme of the genders of Latin nouns ending in -is.

By mid-June he was back in the jungle busily collecting. Included was one all night vigil in a hide to shoot a tiger, but without success. His evenings spent conversing with his Malay companions were of great interest; he learned much about devil-worship and Malay mythology. His companions regarded him as a devil-doctor after he had brought about a miraculous cure from dysentery with one of them by a single dose of Collis Brown's Chlorodyne. Until now the official attitude to the expedition had been one of approval and cooperation. But attitudes were changing. The expedition was

now regarded by officialdom as having political motives, and movements were becoming more difficult. Gwynne-Vaughan set off down the Kelantan river accompanied by Hadji Sirah, travelling downstream rapidly first of all on a native raft of irregular construction, but one which was most effective at shooting the many rapids encountered. Further downstream they changed to a native vessel or praha. Food was in short supply, and they subsisted principally on fruit, including the Durian, described as being enjoyable to eat, but first time tastings were best accomplished with one's nose closed by a clothes peg. Whilst scarcely ever dry he remained throughout in 'uproariously good health'. His objective was to reach Singapore, and thence to Bangkok, to see if the British embassy officials could sort out the unforeseen political difficulties. After this he would be returning home.

An undated letter to Lang covered much the same as the above to his half-sister. Lang's was described as a 'Laboratory letter', to be shared. In this he makes his only references to plant collecting. At the start Skeat had assumed that Gwynne-Vaughan could identify by sight every plant he encountered, an impression quickly corrected. The letter pointed out that to botanise in Malaya during the dry season was closely akin to plant collecting in Britain between October and March. His plant collections were disparagingly described as mainly decomposing vegetable matter, with dried fruits and seed-heads prominent. However, he had recognised some *Nymphaea* species in the lakes. Some giant lycopods 3–4 feet in height had been found, and he had dug beneath them in an unsuccessful search for gametophytes. Amongst other plants seen were *Vittaria*, *Nelumbrium*, *Lygodium* and 3–4 species of *Gleichenia*. Despite the somewhat negative comments on his botanising, it is worthy of record that some of the plant material he brought back included the last new species described by Sir Joseph Hooker before his death. By 26th September he was back in England. 'I am glad to be back of course, but really I am muddled and perplexed, appalled by the complexities of our European life, and I feel strongly that I am an outsidermy interest still being right away back in the honest, clean and simple savagery of the Malay'. Gwynne-Vaughan's accounts of his travels had sufficiently impressed Lang to encourage him to seek leave of absence in 1901 to visit both Ceylon and Malaysia in company with A.G. Tansley, Lang to collect liverworts and Tansley to collect fern material. Lang also familiarised himself with the Malay language, and he and Gwynne-Vaughan on occasions included some information in Malay when corresponding. Whilst Gwynne-Vaughan's eastern experiences had a profound influence on his life and thoughts, there was no change in his subsequent research programme. Both he and Lang had planned to return to the Malay peninsula, but this was not to be.

In some ways Gwynne-Vaughan's 'wanderschaft' may have not entirely fulfilled Bower's intentions, in that on each occasion he was bound to many activities other than botanising. On his return his researches became concentrated on ferns, including tropical species. In the letters there are glimpses of views and prejudices probably commonly held by a young man of his background at the end of the 19th century. A poor regard for other nationalities and their characteristics – seemingly on board ship during the outward voyage only the British contingent regularly queued for baths in the mornings. He was incensed by the 'swaggering behaviour' of the officers of 'La belle Armée'. The table manners of one member of the expedition left a little to be

desired. Except for the Malays, other natives out East were somewhat inferior beings – but even the Malays acknowledged the superiority of the British. The common practice of betel-nut chewing he found particularly repulsive – more especially after trying it for himself. But he became more ‘in tune’ with the ways of eastern peoples, their cuisines and their native lores, than any of his colleagues. Throughout he seems to have had a striking disregard for his own health and safety. In the Amazonian expedition he entered a town stricken with Malaria, but was seemingly unaffected either clinically or psychologically. He was the target for every form of biting insect. It should be remembered that Ross’s discovery of the final links in the life history of avian malarial parasites with mosquito vectors, and hence its relevance to man’s infection, was announced at the July 1898 meeting of the British Medical Association in Edinburgh, and Gwynne-Vaughan could not have known of this! Perhaps regular doses of quinine effectively kept infection at bay. In Malaysia at that time it was accepted that there were unidentified ‘fever risks’ – both Skeat and Evans went down with severe attacks, the latter having to be sent home. But Gwynne-Vaughan sailed through it all in ‘uproariously good health’. Even when encountering a village with Cholera rampant, his main concern was for the native bearers. He saw nothing wrong in his grave robbing activity. But throughout his whimsical sense of humour came to the fore on numerous occasions – never more so than when describing one incident where his life was in danger, as quoted by D.H. Scott from a desultory journal kept during the expedition.¹

‘..One afternoon while here Akib and I got into a nasty adventure. While in a large padang [= a field-like jungle clearing] about its centre, we looked up and saw the leader of a herd of krebau, which had been grazing in the distance had approached us uncomfortably near and looked distinctly uneasy. We tried to scare it off without result; at last it stamped its foot impatiently. Akib yelled out ‘diamon terkau’ and lit out for the nearest jungle in fine style, and the krebau made for us; the whole herd, which had quietly crawled up close, also charged at its heels.

I did a lot of quick thinking, during which I recalled that I had only one shot cartridge in my gun, and then I took off after Akib, being just in time to see him take a flying leap into the jungle. I put in a record 100 yards, getting home a little to the right of Akib, who, as I shot past, I observed was shinning up a tree as hard as he was able. I went on through the jungle, once nearly knocked down by my collecting tin getting stuck between two trees, and fortunately got through into another padang through which I cut at half-mile pace only. At the end of the next jungle I stopped, and Akib shortly joined me saying that the krebau had followed me and had not gone through far. I would have much liked to climb a tree myself, but I had the gun to look after’.

THE TRIUMVIRATE

Just when this descriptive term for the trio emerged is not known. Amongst themselves it came into usage in correspondence after 1907, when Gwynne-Vaughan left Glasgow. In 1902 he was co-author with Bower of a second edition of the latter’s *Practical Botany for Beginners*. Whilst Lang was not mentioned as an author, he would have played some part in the revision exercise. Amongst the Glasgow staff and students the book became known as the ‘Triumvirate’. J.M. McLuckie left Glasgow late in

1914 to take up a Lectureship under A.A. Lawson at the University of Sydney. Lawson had been lecturer under Bower until his appointment to the Chair of Botany at Sydney in 1912. McLuckie's first letter to Bower in January 1915 refers to his first visit to Lawson's apartment, and seeing there a copy of the 'Triumvirate' and a 1912 Glasgow University Calendar.¹⁴ Bower owned a house at the seaside resort of North Berwick, and entertained his staff members there for long weekends, more especially when algal collections were to be made for practical classes. It was also made available for annual holidays of members of his family from Ripon. The house contained a dark room. Bower was a keen photographer using glass plates and a large camera, and doing all the developing and printing himself – an interest shared with the other two of the triumvirate. All three were keen cyclists. Bower's nephew Rodger remembered him arriving at Ripon on one summer vacation with a brand new Lea Francis cycle, of which he was very proud.¹⁵ Freshwater angling in the Scottish lochs was another relaxation enjoyed by all three. Gwynne-Vaughan especially enjoyed his own angling expeditions to remote localities in Ireland and the Scottish Highlands, and to meeting and conversing with all types of men. It is not known to what extent Bower's great interest in music was shared by the others, even with Gwynne-Vaughan's Welsh background.

The most important joint role of the triumvirate lay in their combined contributions to the teaching of the Department. Both the annual salaries of the two Assistants remained unchanged at £150 and £50 until 1900, when Lang's was raised to £175 and Gwynne-Vaughan's to £100. In the same year Lang was awarded the degree of D.Sc. by the University. Gwynne-Vaughan never aspired to a higher degree. All three were to be busily engaged on the summer session of teaching of medical students and first year science students. The more advanced classes for M.A. and B.Sc. were held in the winter months. Until 1901 the accommodation remained limited to the two rooms inherited by Bower in 1885, and it took some strenuous efforts on his part to get the new building under way and established in 1901. A separately housed institute for women students had been opened in 1883 as Queen Margaret College. Lang was appointed Lecturer in Botany to the College in October 1901, without change of salary. In 1905 Lang became responsible for teaching Botany to the 'King's students' – teachers in training – and his salary was raised to £250. Gwynne-Vaughan now succeeded him at Queen Margaret College, with his salary raised to £175. His pay remained at this level until his removal from Glasgow two years on.

Due to the cramped quarters of the Department until the new building was opened in 1901, any effective research could only be limited to vacation periods, and often best carried on away from Glasgow. The opening of the new Botany Building in July 1901, officially performed by Sir Joseph Hooker in the presence of a notable company which included Lord Lister, formerly Professor of Surgery at Glasgow (1860–69), and a self-confessed keen amateur botanist, preceded the 1901 meeting of the BAAS in Glasgow that year, and the new building became the venue for the meetings of Section K (Botany). Gwynne-Vaughan gave two papers at this meeting, on the stele of *Equisetum*, and on the vascular anatomy of *Dicksonia* spp. In the previous March he had published his first major paper on ferns with a study of stelar anatomy in the New Zealand fern *Loxsonia cunninghamii*, with particular reference to the development of

the solenostelic condition. This was followed by a paper on the anatomy of the newly discovered genus *Archangiopteris* from China, and on the modes of development of the lattice-like vascular structure observed in many ferns, both papers published in 1905. According to Scott,¹ Gwynne-Vaughan's researches, especially the paper on *Loxsoma*, '...is altogether an admirable type of modern anatomical work under the influence of the Theory of Descent – the comparative anatomy of the Darwinian period at its best'. It needs to be borne in mind just how fundamentally the scientific attitudes of many botanists of the time were closely geared to the 'Doctrine of Descent.' At the start of his first lecture to first year students, Bower every year without fail reminded them that they must accept Darwinian views on the evolutionary process as the basis for their studies. In passing it is worth noting that Bower was a nephew of the redoubtable Rev. Francis Morris, Rector of Nunburnholme in the then East Riding of Yorkshire, and who from 1869 until his death carried on a strident and protracted campaign in writing and speech with the sole intention of eradicating the pernicious 'Darwinian doctrine' from the realms of knowledge. In his own words, a doctrine '....put forth, moreover, as it is with the most flagrant, the most palpable, the most egregious self-contradictions, the most extravagant demands, contracted by common sense, and in direct opposition to the teaching of astronomy, which proves that in the inconceivably vast space of time which Darwin demands for his theory it was utterly impossible for life of any sort to have existed on the earth.'¹⁶ Bower makes but a passing reference to his uncle in his own autobiographical sketch.

A significant event in Gwynne-Vaughan's life took place at the 1904 Cambridge meeting of the BAAS. He and Lang met Robert Kidston in E.A.N. Arber's rooms. Kidston, of independent means, had established himself as an internationally renowned palaeobotanist, although lacking any formal scientific training. His scientific standing had been recognised by election to Fellowships of the Royal Society of Edinburgh (1896) and the Royal Society of London (1902). There was an immediate rapport between the three, and thereafter Kidston paid regular weekly visits to Glasgow to study present day plants. Later in the year Lang and Gwynne-Vaughan visited Kidston's home at 12 Clarendon Place, Stirling, and there saw for the first time the purpose built study-cum-laboratory which formed part of a new wing added to the house, and, according to Lang, was to become 'one of the best known and best beloved places for both of us'. A productive scientific association was to grow rapidly between Kidston and Gwynne-Vaughan – the combination of a first-rate palaeobotanist and first-rate plant anatomist. Gwynne-Vaughan now worked with Kidston at Stirling whenever time would allow, and their first joint paper on the fossil Osmundaceae was published in 1907, the first in a series of five. These joint researches were all centred at Stirling, as shown in the well-known photograph of the two in the study-cum-laboratory. In time the work would cover the period when Gwynne-Vaughan had left Glasgow. The five papers came to be regarded as classic work, in which by means of anatomical studies the line of present day Royal Ferns was traced back to Permo-Carboniferous times in the Palaeozoic era. The last paper in the series was published in 1914.

The year 1907 was significant career-wise for Gwynne-Vaughan. Whilst placing immense value on the excellent working relationship of the triumvirate, Bower gave every encouragement for the two Assistants to find their rightful academic 'billets'

from a promotion point of view. Hence Lang's unsuccessful candidanship for the Chair of Botany at Trinity College, Dublin, in 1904, when H.H. Dixon was the successful appointee. In 1907 Gwynne-Vaughan applied for the Headship of the Botany Department in Birkbeck College, London, a post which then did not carry a professorship. In the light of his later correspondence the underlying motive for the move is difficult to determine. Possibly seeing it as a step towards achieving a Chair elsewhere; maybe a preference for once more to be working in London, and so near the centre of things. Perhaps a move dictated by a need for more pay. At the time there was no set scale of earnings for Assistants, whose annual emoluments were very



Fig. 2. R.Kidson (left) and D.T.Gwynne-Vaughan at work in the study-cum-laboratory at 12 Caltredon Place, Stirling. (From a photograph given to the Department of Botany, University of Glasgow, by Professor Helen Gwynne-Vaughan.)

much under the direct control of the professors, any increases in individual salaries were very much a process of bargaining in the Senate. Gwynne-Vaughan's salary had always been the lower of the two, and maybe to be still earning £175 was one stimulus for making the move south. Whilst Bower gave all his support, it was with reservations. Of the two Assistants, Gwynne-Vaughan was the more popular with the students. He took an interest in their sporting activities, as befitted a Welshman who had played rugby for his College in Cambridge. He also much enjoyed the winter sport of curling, often in company with Kidston. Gwynne-Vaughan's teaching prowess is recognised in a poem written by a fifth-year medical student for the Glasgow University Magazine of February 1908 – a student publication.¹⁷

A FIFTH-YEAR MAN'S SONG

When I first came to College, so young and so green
 I studied most wonderful stuff –
 At the method of working at Atwood's machine
 And Chemistry written by Luff.
 I tried to cut sections like Mr Gwynne-Vaughan,
 I learned that hydatid cysts burst;
 But that heyday of knowledge is over and gone
 And its long since I finished my first.

Gwynne-Vaughan left a parting present to the Glasgow Department – a black enamelled tea caddy, on which is scratched 'Given to the Botanical Department by Professor D.T. Gwynne-Vaughan in 1907'. By tradition this relic is held to this day by the senior member of staff (not the Head of Department) and handed on when he or she leaves or retires. Each successive change is duly recorded by further scratching.¹⁸

BIRKBECK COLLEGE

Birkbeck College, a constituent college of the University of London, is a lineal descendant of the London Mechanics Institute, founded in 1824, and later named the Birkbeck Institution. Its title commemorates Dr George Birkbeck M.D., a Yorkshireman by birth, but who studied medicine at Edinburgh and London. In 1800, he became Professor of Natural Philosophy at Anderson's University in Glasgow (of which the present day Strathclyde University is a lineal descendant via the Royal Technical College of Glasgow). At Glasgow he instituted lectures for 'intelligent artizans', and the outcome was the establishment of a Mechanics Institute in the town. Birkbeck moved to London in 1804, and whilst running a profitable medical practice, never entirely lost his interest in the education of artizans, and he was instrumental in helping to found the London Mechanics Institute. In time Birkbeck College was to become (and remains) essentially an evening institute for mature students. Because of its origins, for many years it was the only university establishment in England and Wales with any student representation on its governing body. Hence Gwynne-Vaughan was coming to an institution entirely different from any of his previous experience. And there is clear evidence from his letters to Lang that he regarded the move with some trepidation.¹⁹ In the first letter from Leicester, where he was attending the BAAS meeting, he stated that he had formally accepted the Birkbeck post '...and it really appears worse than ever. Almost bad as can be. The accommodation is despicable. No privacy of any kind is possible, the whole thing is a low grade Polytechnic much lower than the Glasgow variety of the same article. It is needless to say that I am harried by vain regrets. I am fairly sure that it is a mistake but whether or no I must see it through now, although it will take me all my time to keep a stiff lip. The Chief is getting a little worried over it also but is otherwise in good form'. The letter included comments on some individuals at the meeting, and expressing some concern at the likely teaching load to be faced. It concludes '...I must hold on to Rendle for all I am worth, I can see that. I am suffering from an acute V-shaped depression and believe that by this time next year I shall be reciting Kipling's 'That Day''.

(Presumably the last was a reference to the lines:-

‘An’ there ain’t no chorus ’ere to give
 Nor there ain’t no band to play;
 But I with I was dead ’fore I done what I did,
 Or seen what I seed that day!’

A.B. Rendle was Keeper of Botany at the Natural History Museum; the implication being that Gwynne-Vaughan was intending to hold closely to important botanical links.

His second letter to Lang from London continued in much the same vein. ‘..Yes, I’m for it now and I feel considerably scared. It is less and less reassuring the more you know about it. I have met with dashed little encouragement from anyone and bally well no help. In fact I’m having a very worrying time altogether...I feel no exhilaration at finding myself in Town somehow’. The third letter was mainly concerned with difficulties of finding suitable accommodation within reasonable distance of Birkbeck College. In the letter he also mentions his predecessor, V.H. Blackman, who combined his Assistantship at the Natural History Museum with the Birkbeck post. Blackman was leaving to take up the Chair of Botany at Leeds – perhaps the sort of career move that Gwynne-Vaughan aimed to follow. His next letter reported that he was still ‘miserable and depressed’ – the accommodation problem had been worrying but he had been able to obtain rooms in King Street, Covent Garden, ‘..near the job. Not what I had hoped for by a good deal but as good as I can afford’. But with regard to Birkbeck ‘..the job is as ominous as ever even at close quarters’. Despite these feelings there are hints that he was beginning to like London and its surroundings – this side of his life should work out well ‘....if I can only stand the worry of the College (I bar the word Birkbeck)’. The next letter, dated 17 September 1907, was written from his address in Covent Garden, where he was adapting to new living conditions – ‘..it is uphill work and a devil of a job creating a new atmosphere’. Whilst this settling in process did not help the business of lecture preparation, the convenience of the new accommodation had some merit – ‘..wonderfully central! 12 min from the Laby [Birkbeck College was then in Chancery Lane], 3 from Leicester Square, 1 from a really excellent pawnshop and 5 from the Embankment’. With continuing appreciation of life in London, some realisation of the severing of the Glasgow link was also apparent, namely ‘....It’s a solid fact that I could keep myself amused in London without having to resort to overwork and relaxation – it’s a devil of a change. I want to put off doing any work until I get back ...to Glasgow! My mind refuses to realise that I am not returning and is daily wondering what the devil I’m trying to do with all these books and things’. The 20 September letter to Lang is in more jocular vein, as if the first shock of the separation was beginning to wear off and the work appearing less burdensome in contemplation – ‘....I believe I can see it through all right, even with some amusement, perhaps even success – But – not service ...I have rivals – Percy Groom has come to the Northern Ply, and the struggle for existence among us bloody Pollies is keen. I have methods of my own, but dare not put them into execution. It has cost me a lot to keep from suggesting to the Principal (who is really a very good sort) that I should send my assistants to hang round the rival institute and see if they can divert a student or so. A free tea in our Restaurante might also do a lot of good. Well anyway, I’m having a change’.

The evident distress in his early letters was probably due to the realisation that he had launched himself into unknown territory as far as the oncoming work load was concerned, and that the pleasant existence (though the lower pay) with colleagues with whom there was a strong rapport was to come to an end. The work at Birkbeck was certainly exacting. He was responsible for organising and participating in the teaching of Botany at all levels. He was duly appointed a Recognised Teacher and Internal Examiner in the University of London. In time he came to appreciate and admire the students in his care – a very different body from his Glasgow experience. Here he was probably assisted by his inbuilt ability to get on with diverse types of mankind. His heavy teaching programmes left little time for research in term time even though this was primarily an evening institute. Vacations allowed him to return to Kidston's study-cum-laboratory in Stirling, and to continue the researches on the fossil Osmundaceae. But his stay at Birkbeck was a short one.

In January 1909 he wrote a letter of congratulation to Lang on the latter's appointment to the newly established Barker Chair of Cryptogamic Botany in the University of Manchester. '..Congratulations. Manchester has done itself proud and (aside) you haven't done so bad either. It seems to me one of the softest of swaps. The Chief will be pleased to have got off one of his daughters so well. Mine was a mesalliance that the family decided to do the best with'. Gwynne-Vaughan's feelings at severing the link with Glasgow were similarly expressed by Lang in a letter to Bower when returning his departmental keys,²⁰ '..Thanks for all your kindness – I shall never have as good a slice of life again ...I am sick at heart to go out into the rude world which I do not know'. Gwynne-Vaughan was not to know in January 1909 that later in the same year he would be receiving letters of congratulation on his appointment to the Chair of Botany at the Queen's University, Belfast. Bower would surely have been well pleased that two members of the triumvirate had successfully found worthwhile academic 'billets', and there can be little doubt that he worked hard behind the scenes to ensure these appointments. In the late summer and early autumn of 1909 Gwynne-Vaughan attended the BAAS meeting in Winnipeg, extending his stay to visit the Canadian Forests and the Great Lakes. The break with Birkbeck College was now complete.

BELFAST

Queen's University Belfast had received its charter in 1908, based on an institution founded in 1845. Hence Gwynne-Vaughan was moving to a foundation Chair with all the problems of establishing a Department. But he faced this move with much less trepidation than the earlier appointment at Birkbeck College. The teaching load was still a heavy one, with Intermediate Science, B.Sc. Subsidiary and B.Sc. Honours classes, with the larger number in the Intermediate class. In his first year Gwynne-Vaughan was the sole lecturer. Once settled at Abbey Cottage, Balmoral in Belfast he was much more at ease with his academic environment, although not entirely free from complaint. In an undated letter to Lang (probably at some time in July 1910) he commented '....I hate to disturb the universal peace but I must have a lab. of my own that does not smell of ultra-putrescent skate'.²¹ He had just 'survived' the first sessional examinations with Bower as External Examiner, the latter 'in great form'. An earlier letter in January 1910 indicated that he was making some attempts at getting

down to a bit of peaceful sectionizing too! – any old Schizeaecious material, worn-out *Lygodium*, scraps of *Anearia* petioles, shop-soiled *Schizea* bases will be thankfully received here'.²² A somewhat rueful letter to Lang followed in March 1910.²³

'It's a jolly good job I got to Belfast when I did for I've been flatly contradicted in no less than four papers since I've been here.

I don't mind fellows calling me a liar but when they set out to prove it things are pretty serious. I have had one facer from a pup of Strasburger's who rediscovers a pit membrane in the trachaea of the Fern – says that Ruthenium Red is no good for staining it and that I didn't use high enough powers etc., and – Damn me if I don't believe he's right!!

On top of that I've just had a paper from Faull anticipating my own on *Osmunda* seedlings in a loathsomely accurate manner and *very cleverly using it as evidence against me*: and here am I full of argument and protest and no a soul who cares a tinker's dam about the whole business to hold forth to.

Well, it would encourage me a good deal if some blighter would find out I was right in something for a change!!'

The letter refers to a paper published by Gwynne-Vaughan in 1908 entitled 'On the Real Nature of the Tracheae in Ferns'. In part this was linked with the work on the fossil Osmundaceae. He had stated that in the Ferns the xylem elements are vessels with true perforations in their longitudinal as well as terminal walls. However, in some Osmundaceae he described a special type of vessel occurs in which the primary tracheal wall completely disappears at certain points, so that the cavities of the pits are vertically continuous in the middle of the wall. The 'Strasburger pup' who controverted this observation in 1910 was Halft, and he was followed in 1911 by a Miss Bancroft. According to D.H. Scott¹, Gwynne-Vaughan had corresponded with Miss Bancroft, but was of the opinion that the matter required further investigation.

Personal affairs intervened in the autumn of 1910. Lang became engaged to be married. Gwynne-Vaughan wrote to Bower in November.²⁴

'..Lang's news is most exciting - poor old fellow – that name is fairly pining for a mistress – he's a soft-hearted sort of chap. He has given me two years and a beating in the matrimonial stakes, but I'm not backing myself heavily in that event. You don't seem to be making the pace very much yourself!

I can't make out how in thunder you get so much work done. It is taking me all my time keeping my lectures up to scratch'.

Perhaps only Gwynne-Vaughan could make that aside on matrimonial matters to Bower (a confirmed bachelor) and get away with it. As with Lang, all letters to the 'Chief' were addressed to 'Dear Professor' and signed formally.

In a further letter to Bower, Gwynne-Vaughan referred to Lang's forthcoming marriage in the following December:²⁵

'..Poor old Lang is getting married in December. He might have had the decency to keep me out of it' (Lang had asked Gwynne-Vaughan to be his best man, and the latter continued in humorous vein that he would loathe the job)' ..earning invariably the permanent contempt of the gude wife'.

In this same letter he expressed his annoyance at the decision of a Commission to recommend that degrees in Agricultural Botany be established at Belfast. In his opinion leading to '....the vulgarisation of a University degree'. He also questioned whether the Principal of Glasgow University, Sir Donald Macalister, a Commission member had been mainly responsible for the decision. In passing it is worth noting that an Ordinance for a degree in Agriculture, with Agricultural Botany a component, existed at the time in Glasgow, but seems not to have been a very strong side academically. One sidelight to Lang's actual marriage is to be found in a letter from Lang to Bower in January 1911.²⁶ It seems that whilst in the church awaiting the arrival of the bride, best man and bridegroom started to discuss some abstruse point on stellar anatomy, and almost quarrelled over their conflicting views.

December 1910 was also marked by an event of potentially great significance for Gwynne-Vaughan. It was the time of year when certificates were under circulation from proposers of those they considered worthy of election to the Royal Society, seeking support as additional proposers from colleagues of like standing. Bower had been approached with a request to support the certificate of A.G. Tansley of the Cambridge Botany Department. Bower immediately wrote in haste to his friend Isaac Bayley Balfour, Regius Keeper of the Royal Botanic Garden and Professor of Botany in the University of Edinburgh. In Bower's opinion, which he was sure was shared by Balfour, Gwynne-Vaughan ought to stand before Tansley on the relative merits of their published work. Bower would refuse to sign Tansley's certificate unless Gwynne-Vaughan was also proposed – '....there could be objections at having too many botanists – but one more good one can do no harm'.²⁷ Bower's certainty of receiving Balfour's support stemmed from their mutual feelings regarding Tansley's work. Bower had some respect for Tansley as a botanist, but considered him second to Gwynne-Vaughan, Balfour had little respect for Tansley's standing as a plant ecologist, and was known to give his unfavourable opinion in a pointed manner on occasions.⁷ Kidston was also quick to add his signature in support of Gwynne-Vaughan. (Lang had already been proposed for Fellowship, and was to be elected in 1911). Gwynne-Vaughan meantime had been contacted by Bower, explaining the procedure and asking for a list of his publications. Gwynne-Vaughan's reply was in a somewhat different tone than usual.²⁸ He confessed that he had found himself appreciably at a loss how to reply, not being familiar with procedures for the Royal Society. He expressed the opinion that two botanists, Tansley and Boodle, were more deserving than he. He assumed that '....some matter of policy underlies the decided prematurity so I fall in with your wishesI take it that it refers to future possibilities – although I don't altogether like it. It has the distinct suggestion of a scramble!!' He enclosed his list of publications, fourteen in number, including the four papers published jointly with Kidston on the fossil Osmundaceae between 1907 and 1910. By the latter part of the month Bower had succeeded in getting Gwynne-Vaughan's proposal certificate to the Royal Society and had received assurance from the Executive Secretary that it would be 'suspended' in accordance with his wishes. In the end the election of Gwynne-Vaughan was not to be. The procedure was that a proposal certificate was 'suspended' for five years and if at the end of that time if the person proposed was not elected the certificate lapsed. The five years would have been up in 1915 – the

year that Tansley was elected.

The Belfast teaching programmes continued to fill most of Gwynne-Vaughan's time. He visited Stirling whenever time would allow to continue his joint research with Kidston. In a letter to Lang in May 1911 he drew attention to these heavy teaching programmes with a particularly high concentration of work during the spring and summer months, and having to give both elementary and advanced lectures in the same week:²⁹

'...Belfast is using me up rather fast. My health is now so rotten that I get into the 'jumpy' Summer Term frame of mind more definitely than I used to. Still if it had been Birkbeck I should have broken down by nowI do wish, however, that there was some kind of companionship in this blessed Town. You are no end lucky to have married and from my pinnacle of perfectly magnificent isolation, I envy you most maliciously. For it is indeed true that as a single all embracing object I am fed up – to rather repletion – with Botany and there is no other interest sufficiently interesting!'

Within four months of the date of this letter his loneliness was no more. Lang writing to Bower in September 1911³⁰ briefly described a short stay in Belfast with a 'Vaughanish Vaughan', and at the same time recorded his pleasure at Gwynne-Vaughan's engagement to a Miss Fraser – '....they make a splendid pair'.

Helen Fraser had been Gwynne-Vaughan's successor as Head of Botany at Birkbeck College. Born in Aberdeenshire and a graduate of King's College, London, she had held appointments at University College, London, Royal Holloway College and University College, Nottingham prior to her appointment to Birkbeck in 1907, the year in which she was awarded the degree of D.Sc by London University for her researches on the fungi. Writing to Bower with the announcement, Gwynne-Vaughan pointed out that in an earlier letter to him Bower had commented how much he 'admired the girl'. Gwynne-Vaughan's letter continued that '....the denouement came with unpremeditated suddenness.... the fact that we are engaged is still a good bit unfamiliar to both of us'. He added in P.S. '....Lang points out that the triumvirate is meeting its fate in inverse order of seniority'.³¹ In a similar vein Gwynne-Vaughan followed up this letter with another the next day regarding the engagement '....both are considerably surprised at it but it simply could not be helped – no blame is to be attached to either of us – there are some things that occur whatever you may do about it!'³² Bower's letters of congratulation to the engaged couple was a gesture much appreciated by Gwynne-Vaughan, especially in the nice things Bower had written to Miss Fraser about her future husband. In response Gwynne-Vaughan jokingly pointed out that he had now lost his chance as settling down to bachelorhood (a quite 'dig' at the 'Chief') and '....isn't it a good thing that Miss Fraser is not an anatomist'.³³

The marriage took place on 7 December 1911 – about twelve months after Lang, and with the roles of best man and bridegroom reversed. There was no mention of any repeat argument on stellar anatomy. Helen Gwynne-Vaughan remained Head of Botany at Birkbeck College, Gwynne-Vaughan made repeated efforts to obtain her a post at Belfast but without success. The Governing Body of the University always objected to any apparent nepotism, although she had been prepared to accept an Assistant's salary. Gwynne-Vaughan referred briefly to their separate lives in a letter

to Lang, '...my wife has left me this morning having been about the place for a week - much to the puzzlement of Belfast'.³⁴

These attempts at obtaining the Lectureship continued through 1912, together with the search for a temporary Assistant for the summer term. At the end of the year he arranged for Lang to be External Examiner for the 1913 diet of examinations. In a letter to Lang regarding this appointment he also expressed concern about the unestablished Lectureship:³⁵

'...I don't know about Helen. She's London to the bone in the matter of University. The delightful old world placid charm of Belfast will probably strike her as stagnation. Dammit - I like stagnating, anyhow, its soothing to be in a place where I almost appear to be a 'Hustler' - without any trouble too'.

He also reported that a start had been made on some 'painful research on the *Equisetums* - so far my previous view of the anatomy is no good at all and full of mistakes...It's getting a bit awful this continual laying bare of one's own fallibility. I'd give a good lot for a spasm of the pellucid assurance of old!'

The summer Temporary Assistantship was resolved by the appointment of one of Lang's 'imprints' from Manchester. But 1914 got off to a bad start with the news that the summer Assistantship was again vacant and seemingly with little chance of replacement. Work continued intermittently on the *Equisetum* material,³⁶ and on an anomalous vascular structure in a specimen of *Osmunda regalis* discovered by his wife, with a 'mixed pith' similar to that observed in the fossil *Osmundites kolbei*. He considered the observation to be '...Traumatic but that is where the job lies!' Affairs at Belfast were not now proceeding so well; '...I am fed up with the way they take it here - abso-bally-lutely. However, one must play one's hand....There seems to be no end to the way in which one's life complicates itself and I am strictly a 'one thing at a time' man. A couple of days at a thing is of as much use to me as a cheese-straw to a Hippopotamus'. Both the enjoyment of Belfast and 'stagnation' had worn off somewhat - feelings which coincided with the advertisement of a vacancy in the Chair of Botany at University College, Reading. In January 1914 Gwynne-Vaughan informed Lang that he was to be a candidate for the Chair. Lang expressed his hope to Bower that the application would be successful, but feared that Reading might not be wanting the strongest man but the most pliable.³⁷ One other candidate known to Lang was D. Thoday, another Cambridge graduate and then Lecturer in Plant Physiology at Manchester, and later to be Professor at Capetown (1918-23) and at the University College of North Wales Bangor (1923-45). Gwynne-Vaughan received testimonial support from Bower, J.B. Farmer, Professor of Botany at the Royal College of Science (1895-1929) and F.W. Keeble, then Director of the Royal Horticultural Society Gardens at Wisley and previously Professor at Reading. In due course Gwynne-Vaughan was appointed to the Reading Chair. As he explained to Bower,³⁸ whilst there was a drop in salary to £500 per annum, Reading should provide more time for research. In the same year he was appointed External Examiner at Glasgow.

The most profitable research carried out during his time in Belfast was with Kidston at Stirling during vacation periods, the fifth paper on the fossil Osmundaceae was published in the latter part of 1914. The *Equisetum* work mentioned earlier was not published.

READING

By the autumn of 1914 the Gwynne-Vaughans had set up home at 14 London Road, Reading, which, being in reasonable commuting distance by rail from central London enabled Helen Gwynne-Vaughan to at last set up a permanent base with her husband. The teaching load was still heavy. As Gwynne-Vaughan described to Bower,³⁹ he was faced with ‘...all sorts of courses - Diplomas, Certificates, Aqs and Horts of exceptional virulence, teachers in training, Inter-B.Sc’s and other variations – the show is now working tho’ it creaks a good deal’. However, the courses at Reading were more evenly spread over the academic session than at Belfast. In December 1914 he confessed to Bower that it had been a very confusing year,⁴⁰ and that little time so far had emerged for research, with ‘....the labs ill-designed and unhandy – no money for any major changes – no decent working bench yet. Must do the work that brings in the wages – but it wastes an awful lot of time’. As a footnote he included ‘....Having a poor time with my old enemy neuritis’ (neuralgia, or possibly migraine). This is the first mention in a letter of his ‘old enemy’. A letter to Lang in March 1915 referred to a stint of examining at Glasgow⁴¹ ‘....The Chief was in fine form in spite of the fact that he is just recovering from a bad leg. His energy physical and mental was quite surprising and altogether too much for me – but Glasgow is a wonderful place – there was old Ferguson going as strong as ever and not perceptibly older’. (John Ferguson, Professor of Chemistry 1874-1915, and then 78 years of age). This short reference to his health not being up to par was followed in July 1915 by a letter from Helen Gwynne-Vaughan to Bower with news of more serious implications, to the effect that her husband was ill with neuritis and now bedridden, and hoping that his health would return during the summer vacation.⁴² From then on his downward progress was rapid. In a letter of mid-August Helen Gwynne-Vaughan told Bower that her husband had developed ‘phthisis of the upper right lung’.⁴³ The condition had probably been dormant for some time, and the weakness induced by the neuritis and ‘given the bacteria their opportunity’. Gwynne-Vaughan was in a very weak condition and had a bad haemorrhage at the beginning of the month. It was essential that he should enter a sanatorium, but would then require a temporary replacement at Reading, and she asked if Bower could help in this matter. Later in the same month she reported that he was now receiving the Sprengler treatment,⁴⁴ but then on 1 September she wrote to say that his condition was now critical, and that he was not expected to live for more than a week. Gwynne-Vaughan sent his greetings, ‘....and his deep appreciation of your life-long friendship’.⁴⁵

Lang had naturally been kept fully informed of the progress of his friend’s illness, and of its serious nature. He wrote to Bower on 19 August⁴⁶ describing the very black nature of the outlook, that Gwynne-Vaughan would be laid up for at least 12 months – ‘a sheer tragedy’. Lang offered to take on the Glasgow External Examinership, on the condition that the fees should be paid to Gwynne-Vaughan and only the expenses to himself. In a letter dated 2 September and written whilst in the train travelling south to visit the sick man, Lang echoed Helen Gwynne-Vaughan’s view that ‘....there is practically no hope’.⁴⁷ He wrote from 14 London Road, Reading, on Saturday 4 September to inform Bower that Gwynne-Vaughan had ‘....pulled up wonderfully well from a serious collapse earlier in the week but that his condition was still critical. I

hope that the treatment will strengthen him'.⁴⁸ Back in Manchester on 6 September Lang wrote to Bower that he had left the Gwynne-Vaughan's home at 4 pm on Saturday 4 September, but that their friend and colleague had sunk rapidly through the evening of that day and had died at 11.30 pm; '....he had known the fight was over, but was as brave as ever'.⁴⁹ Similarly, Lang later informed Scott of this last meeting with Gwynne-Vaughan '....He was very weak and changed, but talked absolutely himself. It was the bravest end to a long fight'.¹

For Lang this must have been one of the most distressing periods of his life. Having just left the deathbed of his closest friend, a second bereavement came in a matter of days with the death of his mother, although she had been failing for some time. He was also due almost immediately to assume the duties of President of Section K (Botany) for the 1915 BAAS Meeting at Manchester. Lang sent an urgent telegram to Bower asking that he attend the Gwynne-Vaughan funeral at Golders Green Crematorium⁵⁰ – perhaps the closest he ever came to making a firm demand of the 'Chief' who in the circumstances anyway would have wished to attend the funeral. As already mentioned, the Section K meeting was suspended on the morning of the funeral.

Whilst the shockwave of Gwynne-Vaughan's death reverberated through the botanical world, for those closest to him the effect was devastating, none more so than for Robert Kidston. As he wrote to Bower,⁵¹ he could not really take in that Gwynne-Vaughan was dead – it was a terrible loss – '....I see him visibly sitting before me!' Kidston was too upset to consider writing any obituaries and begged that Bower should write a definitive one for all the relevant Societies. In a subsequent letter Kidston enquired about the likely fate of Gwynne-Vaughan's massive slide collection, which he considered must remain intact, and should surely come to the Glasgow Department, since '...Gwynne-Vaughan's happiest days were at Glasgow'.⁵² D.H. Scott wrote to Bower in similar vein,⁵³ commenting on how melancholy an affair the Section K meeting must have been, especially for its President. Scott went on to say that to him Gwynne-Vaughan was a man of stature, who like Charles Darwin had taken to science with a real initial enthusiasm. '....He was certainly one of the best men we had....I wish we had got him into the Royal last time!'

Amongst Lang's correspondence is one undated letter from Gwynne-Vaughan which bears Lang's pencilled note 'My last letter from G-V, Aug. 1915'.

14 London Rd.
Reading

Dear Lang,

Many thanks for your cheque for £5.12.6 which I hereby formally acknowledge. To turn to another subject, I have been enormously unwell for over a year with my neuritis and last term I was very hard put to it to carry things out to the end. However, I just managed to do it somehow and then came to pieces completely. I had to go to bed with an acute gastric and intestinal crisis which I have really had for some time. I sat up for the first time yesterday and find myself utterly done up, very weak and exhausted and without the shadow of reserve to draw upon. I expect it will be a very long and slow business before I am able to do

anything. (Between you and me I'm very much afraid I am for the scrap heap and you can look for me at the 'Tail o' the Bank' from now on).

So you see that Manchester's quite out of the question for me and my wife won't go by herself. All the same we both of us thank you very much for your offer of hospitality and assistance.

I think it is a huge mistake to hold a meeting at all.

Absolutely rotten.

With best regards from both of us to you and your wife

Yrs ever

Am tired D.T. Gwynne-Vaughan

(a P.S. was added over the page)

Please give my greetings to any old Belfast colleagues but you need not emphasise any illness.

Letters from Helen Gwynne-Vaughan to Bower after the funeral (all on black lined note paper) referred to details regarding the obituaries, the arrangements to despatch the slide collection to Glasgow, and disposal of research material.⁵⁵⁻⁵⁷ She also sent to Bower a well-used cut-throat razor, with the handle bearing the almost obliterated marking 'G-V'.⁵⁸ The research notes and diagrams went to Lang. The slide collection and catalogue came to the Glasgow Department in 1916. In January of the same year she sent to Bower the photograph of Kidston and Gwynne-Vaughan at work in the Stirling study-cum-laboratory. Helen Gwynne-Vaughan was to remain Head of the Department of Botany at Birkbeck College, with an interruption through war service as joint Chief Commissioner of the Women's Auxiliary Army Corps from 1917-18, with service in France, for which she was made D.B.E. She was made Professor of Botany at Birkbeck College in 1921.

The five joint papers on the fossil Osmundaceae were to remain the outcome of the Kidston/Gwynne-Vaughan collaboration. Kidston was bereft without his botanical colleague, and it was with some relief that he was able to inform Bower in October 1915 that Lang was visiting him, and they had both decided that the most fitting tribute to Gwynne-Vaughan's memory would be for them to continue the fossil work.⁵⁹ Lang confirmed this arrangement, although confessing to Bower that no-one could really replace Gwynne-Vaughan, least of all himself.⁶⁰ The outcome was the important discoveries of the fossil plants from the Old Red Sandstone at Rhynie Chert in Aberdeenshire. Not surprisingly, the first complete description was of the fossil vascular cryptogam named *Rhynia Gwynne-Vaughani*.

RETROSPECT

The sense of deep personal loss expressed by his friends and colleagues has been well expressed in the many letters already quoted. A further expression of this loss was to be seen in the several obituaries. Thus with Bower in *Nature* - '....A life not only of promise but also of notable achievement has thus come to a premature closehis results will be durable and take a permanent place in the web of botanical science'. And, in similar vein in the *Journal of the Linnean Society*, '....He was one different from the common run of scientific men; and it is the unique personality that

we miss most when it is gone'. D.H. Scott expressed similar views in the *Annals of Botany*,¹ '....Those who knew him felt that he was different from the usual type of scientific man of his generation....He accomplished so much, and his judgment was so thoroughly sound that great things might have been looked for from him, if all had not ended so much too soon'. Part of the success of Gwynne-Vaughan's botanical research lay in the fact that it was on aspects of plant morphology very much in tune with the prevailing attitudes of the time, the impact of Darwinism and the continuing theme of the 'Doctrine of Descent' has been described. Not only was 'sectionizing' well in the mainstream of current botanical research, but such activities were low cost projects. Not much bench space was required, and a good microscope, a camera lucida (not used by all), a good razor and a steady hand, skill at staining and mounting sections, and an ability to accurately record one's observations by drawing, were the essential prerequisites. A microtome was a more expensive additional apparatus, but not one used by Gwynne-Vaughan. Even so, at Birkbeck College, Belfast and Reading he found time for research was at a premium, and even the limited amount of bench space required unavailable. His slide collection donated to the Glasgow Department contained some 2200 stained and labelled permanent preparations. Whilst preparation of fossil specimens was a more laborious process, here was Kidston's domain of activity in the Stirling study-cum-laboratory. In the obituary by Scott¹ there was also some speculation on whether had he lived Gwynne-Vaughan's research would have been influenced by the later trends towards experimental morphology, but Scott thought this unlikely. Such speculation was inevitable in the light of the changed climate of opinion which soon followed both with regard to the future of plant morphological research in relation to phylogeny, and the emphasis placed on it in teaching, especially with elementary classes. Within a few years of Gwynne-Vaughan's death this morphological approach came under spirited attack from botanists who considered that morphological studies should be more closely linked with functional aspects, and that plant physiology and ecology should now play more significant roles in the teaching of undergraduates. The so-called 'Manifesto' which proclaimed these markedly different views produced a flurry of correspondence when published in the *New Phytologist*.⁷ As to be expected, Bower was to play a leading role in defending the values of the 'traditional' morphological approach. Would Gwynne-Vaughan have also contributed to the debate? Lang refused to be directly involved, other than to advise Bower on his contributions.

It needs to be remembered how deeply Gwynne-Vaughan was involved in his joint work with Kidston. With all the pressures of his academic life, especially whilst at Belfast, the escape to Stirling and the quietness of the Kidston home where research was the all important matter of the day, was a vocational relief of some magnitude. The heavy teaching 'loads' of professors in the small emerging universities and university colleges of the time needs to be remembered. As already mentioned, they were often both professor and sole lecturer in the early stages of appointments. This state of affairs is well shown in the undated Belfast letter from Gwynne-Vaughan to Lang:

'...The all round lecturing is a terrible thing in a way. I don't mind it but I have absolutely to give all my time to it. Have just galloped through the Gymnos and I am

now in the Ferns. Next term Bryophytes and Cytology. You have to do the thing as well as you can and by the Lord Harry it takes me all my time keeping level with my lectures’.

It seems likely that the Rhynie Chert material would have been a subject for their joint research had Gwynne-Vaughan lived. His response to the ‘Manifesto’ imbroglio might well have been similar to Lang’s, although he might well have provided some cryptic comments in his correspondence! The other speculative suggestion by Scott, that he would have become a powerful figure in British Botany, is more difficult to answer. He was a dedicated research man. In Gwynne-Vaughan’s correspondence it is often possible to detect some distaste for machinations by ‘Establishment’ figures (the ‘Chief’ excepted). His views on the Asquith Government election of 1910 and the likely effects on Irish politics are trenchant and to the point. Nor did he pull any punches when criticising university authorities, and he was not very keen on involvement in either academic or scientific ‘politics’. In contrast, Helen Gwynne-Vaughan engaged in both these activities in full measure.

The morphological and phylogenetic school of botanists went into a decline in the 1920s with the retirements of its principal protagonists, and with the rise of Experimental Botany and Ecology. As with all such waning processes this decline went too far. The phylogenetic approach played a vital role in the foundation of present day studies on plant morphology, and has never entirely lost its relevance.

The great disappointment of his proposers at the lack of recognition afforded to Gwynne-Vaughan by the Royal Society was to some extent balanced by the acknowledgments given in Scotland and Ireland. In 1911 he was awarded the MacDougall-Brisbane medal of the Royal Society of Edinburgh for his work on the fossil Osmundaceae. This is a prize awarded biennially to one whose work the Society considers is ‘...most conducive to the promotion of the interests of science’. He was also elected a Fellow of the Society in 1911 and in 1912 was elected a Member of the Royal Irish Academy.

The obituaries also laid great stress on a ‘unique and altogether attractive and original personality’. That he was an adventurous individual in his early life is well shown by his Amazonian and Malaysian expeditions. In both of these he took risks to life and limb, and seemed to regard himself as being disease-resistant despite the ‘fevers’ and other complaints endemic in some of the localities he visited. We may speculate whether some latent infection may have led to his own ill health and rapid breakdown in later years. His dry humour and whimsical expression of it remained with him to the last – as with his reference to being at the ‘Tail o’ the Bank’ in his last letter to Lang. His sense of humour remained even at time of despair – as with the early stages of his move from Glasgow to Birkbeck College, namely, ‘...There is no doubt about it I’m going to have a devil of a time. It’s not so bad so far – as the falling bricklayer remarked – but there’s that bloody bump at the bottom!’

The last paragraph of D.H. Scott’s Gwynne-Vaughan obituary reads as follows:¹ ‘Now that he is gone, so prematurely, we feel that, whether personally or scientifically, there could scarcely have been a greater loss to English Botany’.

Gwynne-Vaughan, a Welshman whose most productive years were spent in Scotland

and Ireland, would surely have relished the penultimate word in the above!

ACKNOWLEDGMENTS

I gratefully acknowledge the assistance of Michael Moss, Archivist of the University of Glasgow, and of Norman Tait, of the Department of Botany, University of Glasgow, who provided the excellent photographs.

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(GUA = Glasgow University Archives, plus the reference number; GUBDA = Glasgow University Botany Department Archives)

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Library

The reshelving of the German journals began this summer and will continue over the Christmas but it is unlikely that it will be finished until Summer 1994. They are now arranged alphabetically by place of publication, beginning with Berlin and ending with Zwickau. By October we had got to Jena, and hope to have L (Leipzig etc.) and M (Munich etc.) done by Christmas. Although there can still be difficulties in finding German journals not already reshelved, this will get easier as there will be less possibilities to search. We have also managed to catch up with the major backlog of cataloguing so that most books are now in the main card catalogue. This includes entries for a large number of smaller pamphlets on societies and nature conservation leaflets, both stored in a series of boxes. The manuscript "finding aids" have been microfilmed as part of the National Inventory of Documentary Resources: these include the manuscript card catalogue, special catalogues for individual collections and slip index catalogues to correspondents. Copies of this can be purchased at a discount through the Society should Fellows wish to do so.

The Library made a successful application to the National Manuscript Conservation Fund for a grant towards conservation work on the Peter Collinson Commonplace Books held by the Society and some of the Ellis notebooks. This grant will meet half the costs of necessary conservation work and microfilming. Donations towards meeting the costs of the other 50% which the Society has to find will be most welcome. We have already had a donation from the USA and hope that all those who have used these manuscripts in the past will contribute towards safeguarding them for the future.

Further details of the project can be obtained by contacting the Librarian. All such donations will offset the amount needed from the Special Library Fund and so help by maintaining this fund for rebinding and special purchases for which grants are not available.

Donations

We are most grateful to Professor R.E. Schultes FMLS, for the gift of a magnificent series of illustrations by Rosa M. Towne of the Plant Lore of Shakespeare as described by Henry Ellacombe published in a magnificent folio in 1974. Thanks must also be expressed to all those who pass us on journals we would not otherwise receive or arrange for us to be put on the mailing list of journals they edit or distribute. This has helped in keeping the wide range of national and international periodicals we can make available. Recent donations to the end of September include:

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| Dr. G. Buchheim | Encke, F., Buchheim, G. & Seybold, S., <i>Zander: Handwörterbuch der Pflanzennamen</i> . 810 pp., Eugen Ulmer, 1993. |
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Book Review

Recognition of the Recognition Concept: Evolution and the Recognition Concept of Species. Collected writings of H.R.H. Paterson, edition by Shane F. McEvey. The Johns Hopkins University Press, Baltimore & London. 234 pages. 1993.

The realisation that species should be defined in terms of how their individuals perceive each other in their world, rather than the way in which taxonomists see them in their's was an elegantly simple but a remarkable insight. It led Patterson to develop his Recognition Concept (RC) of species, and by doing so to oppose the leaders in the field, particularly, but not exclusively, Dobzhansky (one of his thesis examiners) and Mayr. Winning acceptance for his concept was not easy, and attempting to gain recognition led him into all manner of academic adventures.

My task as a reviewer is not so much to comment on the contents of the book, but rather to expose what has been omitted. The commentary is thin – the fault, no doubt, of the editor, whose own contribution amounts to just over two pages of acknowledgements. The book will, therefore, disappoint readers who are looking for a long overdue synthesis of the RC. Just about all the text has been published previously; the book is a compilation of seventeen articles (addresses presented at meetings, or papers published in books and journals). For example, about half of the book has been lifted directly from the pages of the *South African Journal of Science* (SAJS). The commentary by Paterson, in the beginning and before each paper, will make sense only to those few who knew him and followed his progress. This is a grave strategic mistake by the publishers.

Of more than passing interest is the fact that the book fails to openly recognise that much of the concept was developed in South Africa - the term SMRS, the importance of preferred habitats, the differences between mate choice and recognition all evolved in collaboration with his students in South Africa. This is not merely the omission of trivial historical details, or perhaps the lack of adequate acknowledgement; the fact that Paterson spent his formative years living and working in Apartheid South Africa is highly significant to an understanding of his ideas.

Paterson was born in Natal, went to school in Durban, and attended the University of the Witwatersrand – only later did he acquire Australian nationality. He returned to South Africa as the head of the Zoology Department in 1975 – a year before demonstrating Soweto schoolchildren were ruthlessly gunned down by the authorities. The late seventies and early eighties saw some of the heaviest oppression by the South Africa government as they attempted to defeat the democratic movement. Paterson was always stubbornly opposed to Apartheid. For example, as head of the Zoology Department, he insisted upon a racially integrated tea room (including associated social activities) – trivial gesture by most western university standards, but a highly significant one in South Africa, even at the “liberal” University of the Witwatersrand.

This gives us insight into development of the RC: where better to challenge the racist orientated Isolation Concept (that individuals of different species would happily mate, if it were not for “isolating mechanisms” preventing them - very much the biological counterpart of the South Africa's Immorality Act) than in the White South. The Immorality Act and its companion, the Prohibition of Mixed Marriages were

central to Nationalist Apartheid, since much of its justification lay in sexual taboo. This could have been highlighted by the inclusion of the "Scientific Prejudice" paper.

To deny the South African influence on Paterson's concept is therefore to lose much of the essence of his work. Science is practised by people deeply embedded in culture. Paterson, in South Africa, was an enlightened liberal by any Western standards, but decidedly left wing in the eyes of the South African government. He saw the tragedy and sometimes the comedy in trying to impose reproductive barriers on members of the same species - which of course influenced his view of species.

The first two papers, which were conference presentations, show Paterson exploring the weaknesses of the IC. Significant is the emphasis he places on the influence of GC Williams in his thinking. It is not until the third paper that the S appears in SMRS. The concept is hardening as Paterson indicates that the laboratory experiments that purported to demonstrate reinforcement were deeply flawed. In the cases where two populations attempt reinforcement, the smaller of them becomes extinct. It is an important insight and one which was formalised later in the modelling papers. Also in this paper, Paterson began to consider speciation: he identified elements of the SMRS, which, because of "small characteristic variance which permits selection of small variations" (p27), can change. The SMRS can be modified, albeit slowly, to suit different environments. This is further elaborated in the fourth paper, a short note intended as a response to Templeton. In it Paterson outlined conditions suitable for speciation: "Although under strong stabilizing selection..., the SMRS is subject to modification under natural selection to improve its effectiveness should a small population become isolated in a new and distinct environment" (p33). Such adaptive changes, Paterson indicated, can only occur in small steps, and the co-adaptation between male and female must be re-established at each step. Speciation therefore occurs "...when the SMRS of the members of the daughter population has been so extensively modified that it no longer functions effectively with members of the parent or any other population" (p33). Speciation is an incidental consequence of the adaptation of a small, isolated population to a new habitat.

The fifth article was intended as a review of White's book, *Modes of Speciation*. White, following Dobzhansky, regarded species as adaptive devices to exploit the full range of available habitats. Paterson scrutinised each of his speciation scenarios and indicated that species are incidental consequences of adaptive evolution. The sixth paper is an epitaph to Cyril Darlington, and is curiously out of place in this book, contributing little to our understanding of the RC.

In the seventh contribution, Lambert and Paterson explored the predictions of the IC and RC in terms of the amount of morphological and genetic divergence at speciation. This is the first major paper that examined the greater predictive power of the RC. The eighth is an amplification of the third: Paterson has often spoken and written about how his work is misrepresented, and this paper is full of anti-Littlejohn rhetoric. It is undoubtedly necessary, because Littlejohn seems to deliberately misunderstand that mate selection/choice and mate recognition are different. An important influence on Paterson's thinking arrives in this paper. Coope, and his work (oft quoted by Paterson) on European fossil beetles and how they indicate the response

of their once living populations to fluctuating Pleistocene climates. The implications of preferred habitats and habitat tracking are far reaching, and Paterson recognised it. The main part of this paper, however, is that speciation by reinforcement gets a severe hammering.

Paper nine was a presentation at a University of the Witwatersrand's Darwin meeting. The invitation to Albert Geiser to chair the meeting deserves a fuller mention than the one in the book. Geiser was a high ranking Dutch Reformed Minister (a *Dominie* in Afrikaans terminology), and he occupied a chair of divinity at Pretoria University (often perceived as the ideological, political and academic rival of Wits). His church, representing the South African state religion, invested him with the task of finding biblical justification for Apartheid. After much research he could find none at all, and told them so at a large gathering of church and political aristocracy. He was dismissed by the University of Pretoria and defrocked by the Dutch Reformed Church. Paterson was instrumental in inviting him to chair the meeting. It was a political act, and Paterson's address was equally political, with its emphasis on freedom of thought.

The tenth contribution is a highly contrived interview with Macnamara. Paterson evidently canvassed around his students to see what questions he should be asked before "writing" the interview. Unfortunately, the charming cartoons of them both which appear in the SAJS are missing (Paterson thoroughly disapproved of his caricature).

The eleventh paper, also from a conference, continues the modelling attack on speciation by reinforcement. The twelfth was presented at the Vrba species and speciation conference, and is a useful review. The thirteenth paper expands on the critical rôle of the environment in speciation. The next looks at defining species in terms of sterility – central to the difference between isolation and recognition. Sterility cannot be an adaptation or a mechanism.

Paper fifteen is introduced as having been written for "biologists who are not evolutionists" (I thought they only existed in South Africa!), and contains an interesting narrative summary. Paper sixteen deals with the origin of sex, and calls for an update of the evolutionary synthesis. The final paper is an attempt to understand sibling species, and ends, where Paterson began his career, in applied entomology.

Readers will doubtless then search the following pages for closing remarks, and there comes the main disappointment. There is nothing of a summary or even an attempt at synthesis. This book can only have been compiled (written is the wrong term) for the serious scholar – and all will have access to library resources sufficient to obtain the originals. If the SAJS is not available to you, then merely pressure your library to subscribe (doubtless at an extremely generous exchange rate), and Graham Baker, the editor, will include reprints of the relevant papers from back issues – after all, the academic boycott is now over.

It is quite clear that the RC has changed over the years – the addition of S to MRS, the rôle of mate choice, the importance of species' habitats and the implication of habitat recognition. There are still more issues to be discussed within the concept – the brief flirtation with speciation, Punctuated Equilibrium, macro- versus microevolution, hierarchy theory and others. What Paterson's readership must ask is

where is the concept now, and how does it impact on these issues? This book unfortunately cannot tell us. The only addition to the papers, which can be read in the journals, is pitifully brief. Reprinting seventeen papers is not enough.

“Evolutionary biology is a complex field calling for skill, expertise, and experience in many fields, not least in philosophy and writing” (p87). It is a pity that neither Paterson nor McEvey thought to put a little more writing into this book. With the appearance of this volume, and another on the way (a collection of unconnected manuscripts from various authors, edited by Lambert who was a student of Paterson’s and Spencer who was not, and with a thinly veiled emphasis on non-Patersonian structuralism), I presume this means that the definitive book he has been promising us for so many years has been shelved. Or has SMRS now become structural? We should be told.

R.J. RAYNER

Brian Thomas Styles (1934 – 1993)

Tropical taxonomy has suffered a severe loss by the premature death of one of its most valued and productive members who was at the peak of his career.

Brian Thomas Styles was born on the 26th of September 1934 in the small village of Chedworth in Gloucestershire, England. After an education in the local grammar school of Northleach he studied botany at Wadham College Oxford. He continued his post graduate studies at Oxford University and obtained his doctorate from a thesis on the *Polygonum aviculare* species complex of Great Britain supervised by the well-known authority on the British flora, E.F. Warburg. During his post-graduate studies Styles served as demonstrator in the practical classes of Warburg’s plant taxonomy course. I remember him well as a friendly and helpful teacher who was always ready to encourage his charges. After the completion of his doctorate Styles was offered a three year research assistantship by the then Commonwealth Forestry Institute of Oxford University (now the Oxford Forestry Institute of the Plant Sciences Department of Oxford University). His assistantship turned his attention further afield to tropical botany because it was to prepare monographs of commercially important tropical forest species. His position was constantly renewed and at the time of his death after 33 years of service to tropical taxonomy he was Senior Research Officer and Forest Botanist in the Oxford Forestry Institute. His position was funded by the Overseas Development Administration (and its predecessors) of the British Government Ministry of Overseas Development. It is much to his credit that they supported an important taxonomic effort over such an extended time period and long before the biodiversity crisis was recognised. During his career at Oxford he served as the botanical advisor to a group of 20 foresters.

Styles’ first tropical work was on African and American Meliaceae which led to several major publications including a generic monograph of the family in collaboration with T.D. Pennington. An important work was a study of the cytology of the Meliaceae with his Oxford colleague Canio Vosa. For this study he gathered together seed material from around the world which was then cultivated at Oxford in order to use the root

tips for the chromosome work. This was a pioneer study that demonstrated the thoroughness and pertinacity of Styles in obtaining such a comprehensive collection on which to work. Published in 1971 it was the first extensive cytological study of the chromosomes of a large woody family of tropical plants. It is an outstanding piece of work because the identity of each species was backed up by herbarium voucher specimens. Although he continued his interest in Meliaceae until the end of his career, since 1970 his principal work was on the pines of Mexico and Central America which also led to a long series of papers on their taxonomy, nomenclature cytology and seed biology. At the time of his death he was nearing completion of a monograph of the pines for Flora Neotropica. It is to be hoped that his colleagues at Oxford ensure that his *magnum opus* is completed in a timely fashion.

Styles' fluency in several languages (fluent French, German and Spanish and a good knowledge of Swahili and Russian) equipped him well for field work. He made many field trips to Mexico and Central America to study, collect and explore the distribution of various woody genera of interest to him and his colleagues at Oxford. This included field studies of *Cordia*, *Cedrela*, *Liquidambar*, *Pinus*, *Swietenia* and many Leguminosae. His work on *Acacia* took him back to Africa where he had spent a year in 1962-3 collecting Meliaceae and other emergent species. He was active in the field until the end, his last field trip to Mexico was in 1992.

In addition to all his responsibilities as a researcher Styles was deeply committed to education and participated fully in the educational activities of Oxford University where he taught and also supervised many postgraduate students. He worked with the Oxford Delegacy of Local Examinations where he served as an examiner and awarder for O and A level Biology. He was actively involved in curriculum development and sat on the most senior committee of the Delegacy from 1986 to 1992.

Another of his interests was the conservation of genetic resources and he was co-editor of a book on the breeding and conservation of tropical trees. He served as Chairman of the Conservation Group (IUFRO) Division 2.01 and was an active member of the mahogany conservation group. He edited a Data book on endangered tree and shrub species and their provenances.

He will be particularly remembered for his open and generous nature. When help was needed he was always available to anyone to share his expertise in botany, nomenclature and languages. If a Latin description needed improvement he was there to assist. His patience and sympathetic understanding of the needs of overseas students, often from educationally deprived backgrounds enhanced the quality of their time at Oxford. For many people his kindly guidance was crucial at a critical stage in their careers. He will be sadly missed in many countries around the world where he had a wide range of friends.

Styles was assisted throughout his career by his wife Cynthia who did much of his secretarial work in addition to her work as secretary to the Oxford University Herbarium. He is survived by Cynthia and by his one son.

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