

One hundred and twenty-five years of the *Annals of Botany*. Part 2: the years 1937 to 2012

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- **Background** *Annals of Botany* is a peer-reviewed plant biology journal. It was started in 1887, making it the oldest continuously published plant science title. A previous article [Jackson MB. 2015. One hundred and twenty-five years of the *Annals of Botany*. Part 1: the first 50 years (1887–1936). *Annals of Botany* **115**: 1–18] summarized events leading to its founding, highlighted the individuals involved and examined the Journal's achievements and management practices over the first 50 years to 1937. This second article covers the next 75 years.
- **Sources of information** The account draws principally on the Journal's own records, minute books, financial accounts, original letters and notes held by the Annals of Botany Company, the Journal's owners and managers.
- **Content** In 1937, its 51st year, the Journal was re-launched as *Annals of Botany* New Series and its volume numbers were reset to No. 1. The present article evaluates the evolution of the New Series up to 2012, *Annals of Botany*'s 125th anniversary year. The period includes a 2-year run-up to World War II, six war years and their immediate aftermath, and then on through increasingly competitive times. The ebb and flow of the Journal's fortunes are set against a roll-call of the often highly distinguished scientists who managed and edited the Journal. The article also examines an internal crisis in the 1980s that radically altered the Journal's organization in ways that were, ultimately, to its benefit. The narrative is set against changes to economic conditions in Great Britain over the period, to the evolving nature and geographical distribution of much experimental plant science and to the digital revolution that, from the late 20th century, transformed the workings of *Annals of Botany* and of scientific publishing more generally.

Key words: Academic Press, *Annals of Botany*, Annals of Botany Company, botany, Clarendon Press, history of science, not-for-profit publishing, Oxford University Press, plant science, science journal history.

INTRODUCTION

This is the second of two articles that together document the development of the peer-reviewed plant science journal *Annals of Botany* since its founding in 1887. Part 1 (Jackson, 2015) covered the 50 years ending in 1936. It dealt with the background to the Journal's foundation and with the individuals involved. It uncovered an internal dispute that, in the late 1890s, threatened the survival of the Journal and evaluated the Journal's attempts to recover from the setbacks associated with the World War I. Novel features of the earliest issues of *Annals of Botany* included literature surveys, coloured plates, obituaries and lists of new botanical books in addition to the usual research papers. This rich content was indicative of a youthful and ambitious founding management looking to achieve leadership in scientific botanical publishing in the English language. The founders wished to attract authors and readers from beyond Great Britain, especially from the USA. This was reflected in the appointment of an editor resident in America at the start. Since 1903, the Journal has been owned and managed by an independent legal entity, the Annals of Botany Company (hereafter referred to as 'the Company'), which morphed from the

founding committee that owned, edited and managed the Journal for its first 16 years. This newly formed registered company comprised up to ten members and created a legal framework for the Journal and limited the financial liability of company members to a nominal sum (£1). The Company was able to choose the Journal's publisher, negotiate terms and oversee most aspects of the Journal's workings. For the most part, this legal framework still applies, although in 1984 editorial duties passed to a separate Editorial Board overseen by the Company. A chronologically arranged list of the membership of the Company (from 1937) and of the Editorial Board (from 1984) comprises [Supplementary Data Item 1. Table 1](#) gives the names and years of service for past Company Chairmen and Chief Editors (or equivalent). For completeness, this dates back to 1887.

By 1937, *Annals of Botany* was enjoying a growing subscription list and was comfortably off financially. An optimistic note had been sounded by plans to re-launch the Journal with Volume 1 of *Annals of Botany* New Series starting in January 1937. Just as the Journal's founding coincided, auspiciously, with Queen Victoria's Golden Jubilee (1887), *Annals of Botany*'s re-birth in 1937 as the New Series coincided with the

Mike Jackson joined the Editorial Board of *Annals of Botany* in 1988 and served as the Journal's Chief Editor for 12 years from 1996. He worked to establish the Company's open access journal *AoB PLANTS* and was its first Chief Editor (2009–2012). He is a member of the Annals of Botany Company.

TABLE 1. Names and years in-post of those who served as Chairmen of the *Annals of Botany* Company or as Lead Editor, Chief Editor (or equivalent) of *Annals of Botany*. For completeness, the list is backdated to the founding of the Journal in 1887

Names of post-holders	Start date	Finish date
Chairmen of the Company		
Sir Isaac Bayley Balfour FRS	1887	1912
Dukinfield Henry Scott FRS	1913	1933
Sir Albert Charles Seward FRS	1934	1941
Felix Eugen Fritsch FRS	1941	1954
Thomas Maxwell Harris FRS	1954	1962
Cecil Terence Ingold	1962	1971
John Heslop-Harrison FRS	1971	1984
John Eggerton Dale	1985	1995
Jeff Moorby	1996	2003
Michael David Bennett	2003	2008
Hugh Gordon Dickinson	2008	>2012
Lead Editors, Chief Editors or equivalents		
Sydney Howard Vines FRS	1887	1900
Dukinfield Henry Scott FRS	1900	1912
Sir John Bretland Farmer FRS	1912	1921
Vernon Herbert Blackman FRS	1921	1947
William Harold Pearsall FRS	1948	1964
John (Jack) Heslop-Harrison FRS	1961	1967
John Frederick Sutcliffe	1967	1983
John A. Bryant	1983	1984
John Anthony Abbott	1983	1984
David Frederick Cutler	1984	1990
Roderick Hunt	1990	1996
Michael Barson Jackson	1996	2008
John Seymour (Pat) Heslop-Harrison	2008	>2012

coronation of King George VI and Queen Elizabeth, an event that marked another kind of re-birth, that of the British monarchy, following a scandalous abdication. The present article plots the fortunes of the *Annals of Botany* New Series from its beginnings in 1937 to 2012, the 125th year of the Journal. It encompasses the run-up to World War II, the six war years, a protracted post-war era, an organizational crisis in the early 1980s and strong competition thereafter from a lengthening list of younger journals. The 15 years to 2012, in particular, were characterized by fundamental changes to methods of printing and publishing, to the ways scientific journals were purchased and read and to the nature and geographical distribution of much experimental plant science. Nevertheless, by 2012, *Annals of Botany* had grown in popularity and emerged successfully from its UK-centric past to become a highly international and well-cited general botanical journal. Remarkably, its 125th anniversary coincided with the diamond jubilee of the present British monarch, Queen Elizabeth II. Monarchy and Journal have thus, unknowingly, marched in step since Queen Victoria's 1887 Golden Jubilee.

The approach taken by the author is that of an interested outsider evaluating archival material and, from time to time, adding contextual information and interpretation. However, from 1996 to 2008 the author was the Journal's Chief Editor and remained a member of the Company thereafter. Coverage of these last 16 years is inevitably that of an insider with his own particular preoccupations. It will be up to some future historian of the Journal to make a more detached analysis of these years.

Files in the [Supplementary Data](#) section (online only) include details of all who served the Journal since 1937 as Company members, Editors or as editorial office staff. The [Supplementary Data](#) also include an account of extraordinarily convoluted attempts by the Company to avoid paying income tax going back to 1918.

SOURCES OF INFORMATION

Uncited information is mostly taken from the Journal's extensive collection of letters and minutes of meetings of the *Annals of Botany* Company dating from 1937. Minutes of Editorial Board Meetings (begun in 1984) have also been referred to extensively, as has a collection of letters donated by Professor John David Dodge and his written account of the time he held the joint Secretary/Treasurership of the *Annals of Botany* Company (1977–1997). Most of these records are presently held at the registered address of the Company (currently at the University of Exeter, UK) or have been archived at the Royal Botanic Gardens, Kew, UK. Relevant correspondence of John Walter Guerrier Lund FRS, a former member of the *Annals of Botany* Company, has also been consulted (archived by the Freshwater Biological Association), as have documents held by the Oxford University Press Museum. British currency was not decimalised until 1971 and comprised pounds, shillings and pence. For convenience, pre-1971 currency information is been expressed in decimal form (e.g., £2.5 for 2 pounds: 10 shillings). Currency values in the text are also converted to 2012 values (based on changes in the retail price index) using the purchasing power calculator of Officer and Williamson (2014).

THE RUN-UP TO WORLD WAR II

At the start of 1937, the owners, editors and managers of the *Annals of Botany* (i.e. members of the *Annals of Botany* Company) comprised the following nine highly distinguished, if elderly, individuals. (1) Frederick Orpen Bower FRS (Fellow of the Royal Society). Bower was a founder of the Journal and had thus served the Journal for 50 years. (2) Sir John Bretland Farmer FRS. Farmer had been with the Company for 33 years and was both an assisting editor and the Company's Treasurer. (3) Francis Wall Oliver FRS. Oliver had served for 32 years and was an assisting editor. (4) Sir Albert Charles Seward FRS. Seward (Fig. 1) had also given 32 years' service to the Company and been its Chairman for 3 years. (5) Sir Arthur William Hill FRS. Hill had been with the Company for 19 years. (6) William Henry Lang FRS. Lang had served the Company for 7 years. (7) Vernon Herbert Blackman FRS. Blackman (Fig. 1) was the Editor (we would now say Chief Editor) and had held the post since 1921. (8) Felix Eugen Fritsch FRS. Fritsch had been with the Company for 10 years. (9) Arthur George Tansley FRS (Sir Arthur from 1950). The 65-year-old Tansley had joined 2 years previously and was the only member to have been appointed since 1930.

During 1936, the Journal's Editor (Blackman), 'assisted' by Oliver and Farmer and his American co-editor, Arthur Johnson Eames (not a member of the Company), assembled the first volume of the New Series. Annual subscription was £2 (≡ £109.30 of purchasing power in 2012) for four issues, unchanged

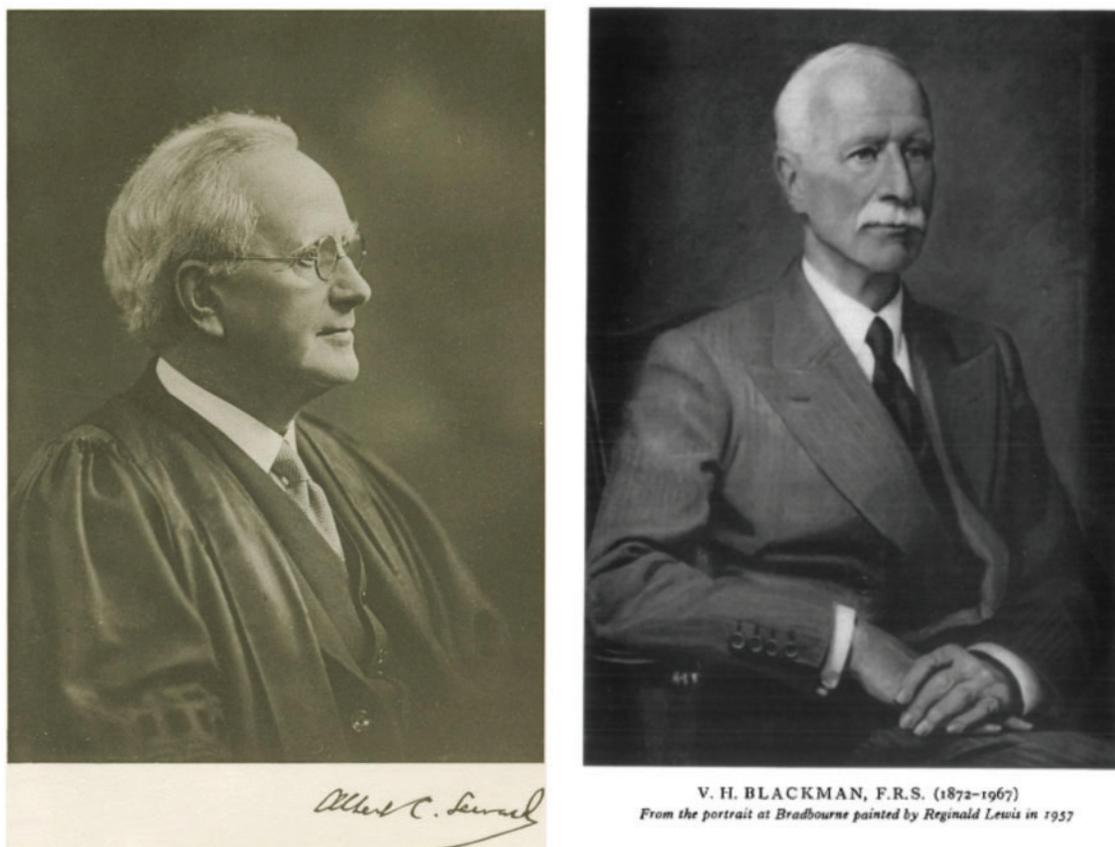


FIG. 1. Sir Albert Charles Seward FRS (left) and Vernon Herbert Blackman FRS (right). Seward was the Chairman of the *Annals of Botany* Company from 1934 to 1941 (portrait from Thomas, 1941). Blackman was the Editor of *Annals of Botany* from 1921 to 1947 (portrait from Brown, 1968).

since 1920. The Company allowed its publisher, the Clarendon Press (an imprint of Oxford University Press) to spend £50 (\equiv £2877) promoting the New Series. The front cover of the promotional leaflet they produced is shown in Fig. 2. The Company hoped that starting the New Series would raise the number of subscriptions above the 593 achieved in 1936 and presumably also raise the number and quality of the papers published.

There had been no overall increase in size since 1929 and the Journal had yet to improve on the 67 papers it published in 1911. The 1936 issue contained 46 papers, less than half the number published by its chief competitor, the society-based *American Journal of Botany* (109 papers). It was also considerably smaller than two other comparable American journals, namely *Plant Physiology* (67 papers) and the *Botanical Gazette* (51 papers plus book reviews). Not surprisingly therefore, few papers had come to *Annals of Botany* from the USA for several years. This lack of competitiveness was reflected in the Journal's old-fashioned design and layout. This had barely changed since 1887 and, externally and internally, the New Series differed little from its predecessor (see Fig. 3 for comparison with the 1910 front cover and Supplementary Data Item 2 for a comparison of the first pages of two typical articles). Clearly, the opportunity to modernize and refresh the Journal's image provided by launching the New Series had been missed.

The ageing management (their average age was 67) seems to have had little taste for change. Most Company members and

editors had been, and still were, very busy men with much of their energy expended elsewhere. They can, perhaps, be excused their distraction. For example, in addition to his teaching and research, Seward (the Company's Chairman) had been vice-chancellor of Cambridge University (i.e. the University's principal academic and administrative officer) and head ('Master') of his Cambridge college (Downing College), and in 1939 was President of the British Association for the Advancement of Science. Seward was also vice-president of the Royal Society from 1934 to 1940 (Thomas, 1941). The minutes of the Annual General Meetings (AGMs) of the Company show little concern for the performance of the Journal *per se* but recount satisfaction with its modestly improving financial position (Fig. 4). Thus, despite the great eminence and experience of Company's members (all Fellows of The Royal Society and professors or former professors at prestigious universities, with Seward and Farmer having knighthoods), their high average age and extraordinarily long service to the Company, onerous duties elsewhere and the Company's comfortable financial situation probably explain the lack of reforming zeal.

A preoccupation with finance was a feature of the years up to World War II. This period saw subscriptions grow from 585 in 1936 to 629. In 1938, the Clarendon Press agreed to publish the New Series under very similar financial terms to those originally agreed by Sir Isaac Bayley Balfour and Sydney Vines in 1887 with the concession that that only £1500 (\equiv £81 100)

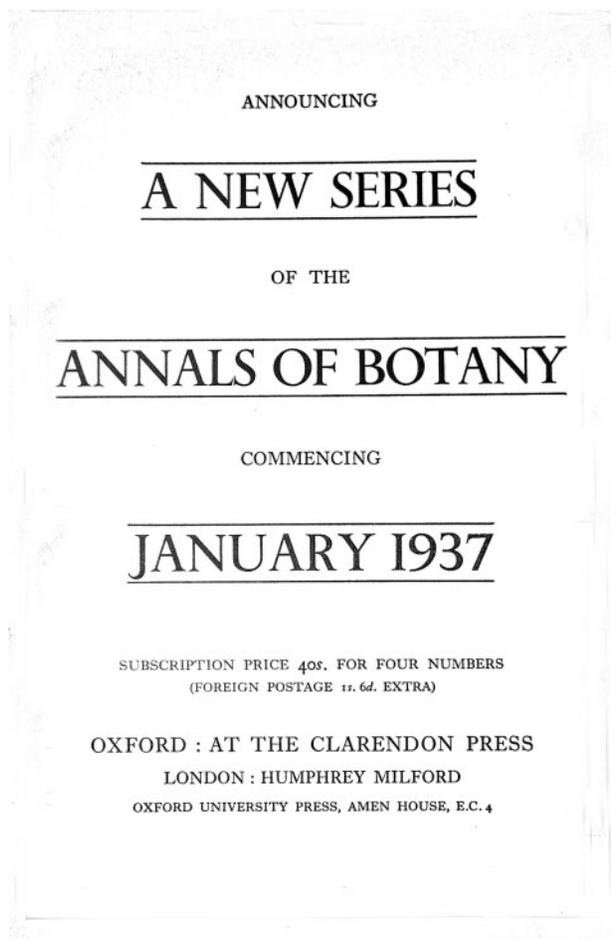


Fig. 2. Title page of a flier prepared in 1936 advertising the launch of *Annals of Botany* New Series the following year.

of the Journal's accumulated wealth need be left on deposit with them. For the first time, the Company was free to invest the remaining surplus on its own behalf. In July 1938, it decided to invest about £1000 (≡ £54 060) in UK Government War Bonds paying 3.5 % per annum. The following year the Company needed to appoint its own auditor (Deloitte, Plender and Griffith) since the remit of the Clarendon Press's own auditor did not cover this now separate investment. A 52-year-old tradition of appointing the Clarendon Press's auditor, Sir Nicolas Waterhouse (forerunner of today's well-known PricewaterhouseCoopers international firm of auditors), had thus come to an end.

By the 1939 Annual Meeting and 2 months before Great Britain declared war on Germany, the Journal had grown modestly from 46 papers in 1936 to 52 papers. These were mostly from the UK, with 13 from the British Empire, two from Egypt, one from the USSR and one from the USA. Physiology was by far the most popular subject (30 papers). Accumulated wealth stood at approximately £2500 (≡ £136 400), emboldening the Company to start paying for members' lunches at annual meetings! The substantial sum of £1000 (≡ £52 500) was allowed for the Editor's postal and secretarial expenses incurred in editorial work each year.

THE WAR YEARS (1939–1945)

Wartime difficulties

By the time of the Company's 1940 annual meeting (held at the Royal Society for the first time since 1917), Great Britain had been at war with Germany for a year and the war's effect was already being felt. Increased production costs and Government-imposed paper rationing restricted volume size to less than 800 pages a year and annual subscriptions had plummeted from 629 on 31 March 1939 to 556 a year later. Thirty-six subscriptions from Germany and 29 from the USSR had not been renewed and these losses were compounded a year later by 39 lost from Japan and 28 from German-occupied countries; 11 were lost from India, 13 from the USA and a further nine from Russia. By March 1942, subscription renewals had fallen further to 381 and, by March 1944, had reached an all-time low of 373 (see Fig. 5 for trends in the number of subscriptions). In that year, the annual output had shrunk to just 26 articles. Physiology remained the dominant topic (15 papers). Sales of back issues had long been an important source of additional income. However, the need for paper salvage to support the war effort led to the recycling of about 8000 unbound copies of Old Series issues, leaving just 40 for each volume for storage by the Clarendon Press. This represented a considerable loss of potential future earnings. But, when the Government later commandeered much of the Press's warehouse space in Oxford, all copies of the Old Series had to be moved, at the Company's expense, to Queen Mary College, University of London (the Chairman's college). Problems with the back issues in particular caused the Company to resolve (in 1944) to set up a new overarching agreement with the Clarendon Press, or another publisher, within 'three months after an armistice in the west' (i.e. once the war against Germany was over).

Changes to management

The period saw many changes. In 1938 Lang resigned. He had not attended an annual meeting since 1921 and was, therefore, unlikely to have been much missed. Two new appointments that year were 34-year-old Thomas Maxwell Harris FRS, Professor of Botany, University of Reading, and 51-year-old Edward James Salisbury FRS (Sir Edward from 1946). Salisbury had succeeded Oliver as Quain Professor of Botany, University College London, and in 1943 replaced Hill as Director of the Royal Botanic Gardens, Kew. Farmer resigned from the Company and the following year the Chairman (Seward) died unexpectedly. One vacancy was filled by 48-year-old Frederick Tom Brookes FRS. Brooks, a plant pathologist, had been a student of Harry Marshall Ward FRS (a founding editor) and was Seward's successor as Professor of Botany at Cambridge (Moore, 1953). T. G. Hill, a morphologist, physiologist and phycologist from University College, University of London, filled the second vacancy. Hill was the first ever non-professorial appointee and also the first Company member not to have been a Fellow of the Royal Society. Fritsch (Fig. 6) became Chairman and, on the death of Sir Arthur Hill (Treasurer) in 1942, Brookes replaced him, with David Guthrie Catcheside, a cytologist and geneticist from the Botany School, University of Cambridge, joining the Company. Oliver stood down as an assisting editor after an impressive 30 years but remained a Company member. Oliver's post

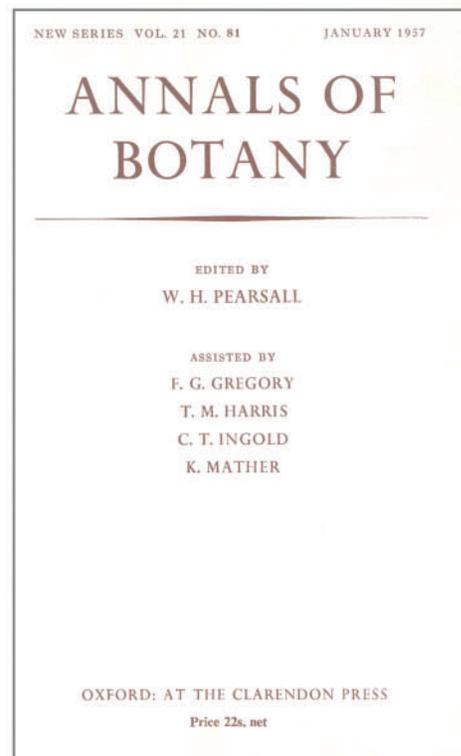
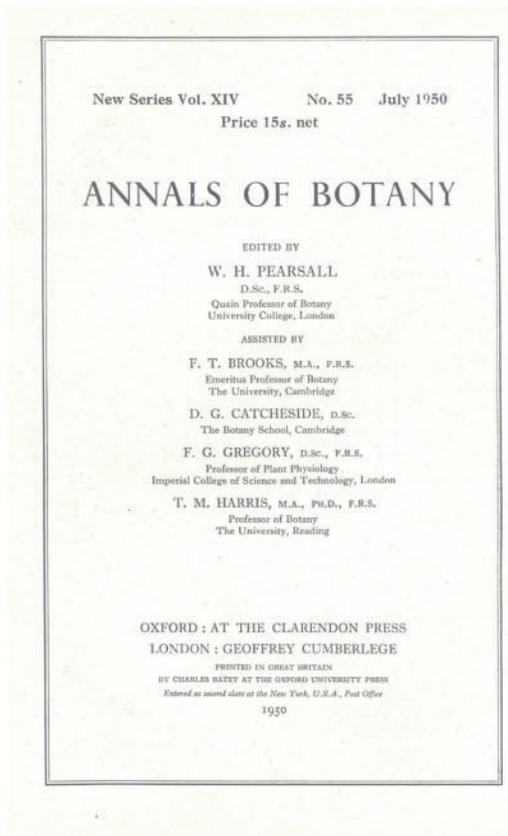
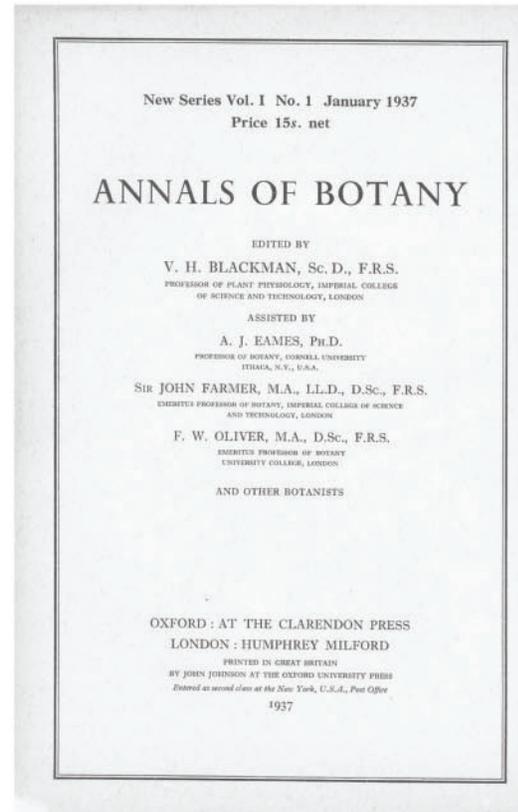
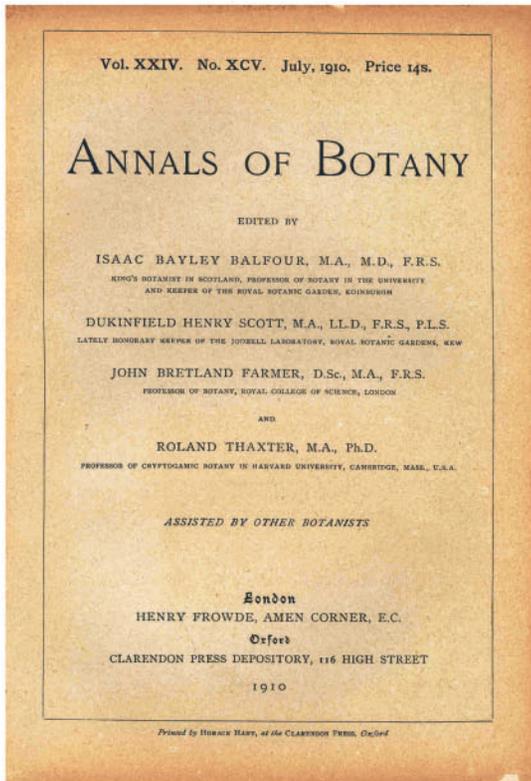


FIG. 3. Front cover designs for *Annals of Botany* Old Series and New Series. (Top left) Old Series design used from 1910 to 1937. (Top right) First New Series design, used from 1937 to 1950. (Bottom left) Design used from 1950 to 1956. (Bottom right) Design used from 1957 to 1962, when Roman numerals were finally abandoned and coloured ink was used for the first time. The dimensions of the Journal were approximately 6 3/8 inches × 9 3/8 inches (16.2 cm × 23.8 cm).

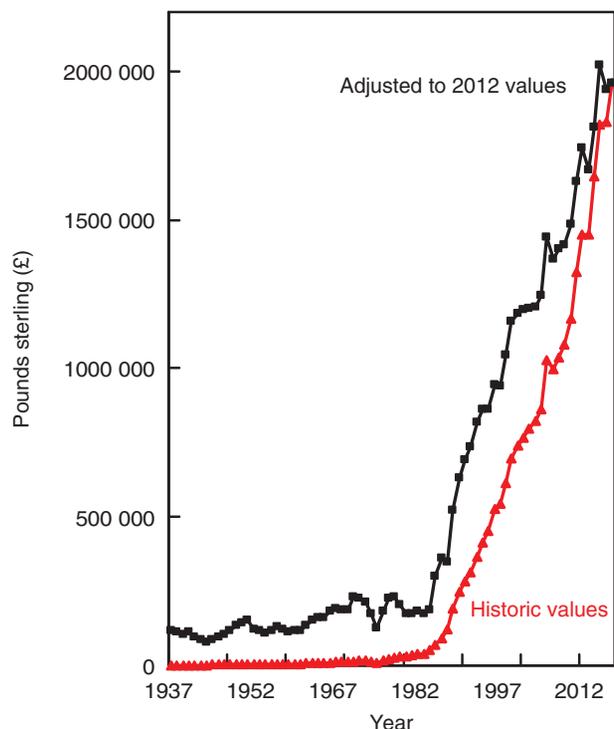


Fig. 4. Financial reserves accumulated by the Annals of Botany Company from 1937 to 2012. Figures are shown as original historic values and after adjusting for consumer price inflation to 2012 according to www.Safalra.com/other/historical-uk-inflation-price-conversion/ (Website 3).

remained unfilled and Blackman (with Eames, the Editor for America in support) took over all editorial duties – a huge job for the 70-year-old veteran. These changes reveal little deviation from the long-established custom of choosing elite university academics to manage and edit the Journal.

Financial matters

Wartime attrition and attendant inflation eroded the true wealth of the Company. In March 1939, accumulated wealth had stood at £1868 (\equiv £106 196). By 1945, this figure (now comprising cash balance, War Bonds and accumulated interest on that stock) had grown to £2570, although currency inflation (which peaked at 13.5 % in 1940) would have depressed its overall purchasing power.

FIVE POST-WAR YEARS

The immediate aftermath (1945)

By time the Company met for its 1945 Annual Meeting, the war in Europe had been over for 6 months and a sense of a new beginning is evident from its content-rich minutes. The number of subscriptions rose immediately. Far-sighted government plans to normalize working links between Great Britain and Germany and countries previously occupied by Germany had resulted in 34 sets of the New Series covering the war years being bought by the Ministry of Education and dispatched to some of the European libraries where subscriptions had lapsed

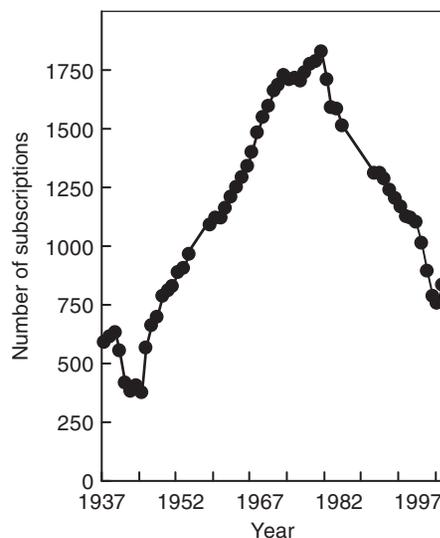


Fig. 5. The number of subscriptions to *Annals of Botany* from 1937 to 1999. Consortial licences increasingly replaced individual library subscriptions after 1999. Thereafter, subscriber numbers no longer reflect the true extent of the Journal's distribution. By 2012, the proportion of income from individual library subscriptions was 41 % of the total.

because of the hostilities. As resolved in 1944, the old agreement with the Clarendon Press was immediately overhauled. From 1 April 1945, the Press would add 10 % to subscription income to cover costs of office work, warehousing, cataloguing and record keeping. In return, the Clarendon Press would no longer hold the £1500 deposit agreed in 1938. The Annals of Botany Company could now invest this and all its other funds as it wished. A disadvantage would be that the Company would, in future, transact almost all aspects of its business itself other than sales. Thus, for the first time, the Annals of Botany Company was not only financially independent but now responsible for many of the long-standing administrative duties previously borne by its publisher. To help Brooks with the extra work, Catcheside was made Assistant Treasurer in 1945. Both were at Cambridge and this is where all banking and accountancy became concentrated.

1946–1950

The last vestiges of the Victorian/Edwardian era were lost when Bower, a founder of the Journal, resigned in 1946 after 60 years. The war with Germany now being over, the Journal seemed primed for a better peacetime future and swung into action with three closely spaced special meetings (May 1946, April 1947 and March 1948) and two especially long annual meetings (November 1946 and 1947), mostly concerned with administration and financial management.

At this time, the Company wished to pay the Editor a set amount for his work. However, the Company's accountants (Allan, Charlesworth and Co.) identified relevant statements in the 1903 Memorandum of Association that seemed to contradict those in the Articles of Association that set out the legal framework for the Company. The contradictions made payments to the Editor legally questionable. Any payment would

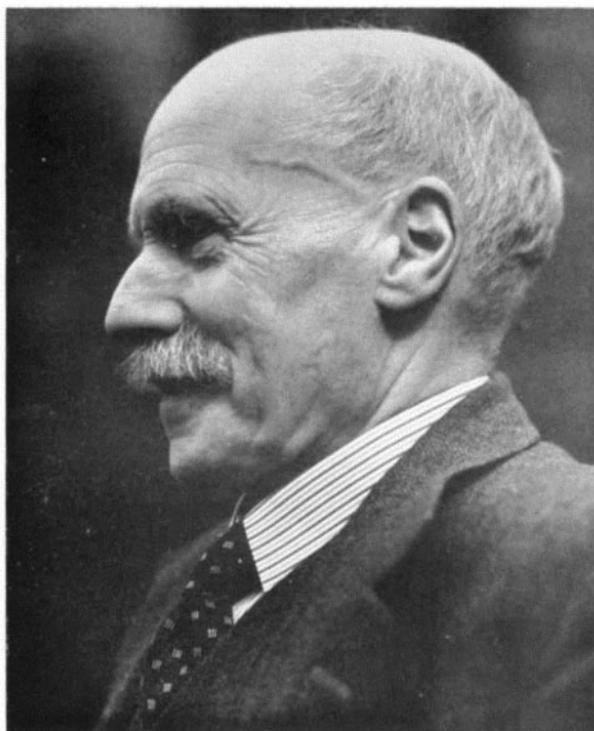


Photo. G. C. Monkhouse, F.R.P.S.

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FIG. 6. Felix Eugen Fritsch FRS (left) and William Harold Pearsall FRS (right). Fritsch was Chairman of the *Annals of Botany* Company from 1941 to 1954 (portrait from Salisbury, 1954). Pearsall was Editor or joint Editor of *Annals of Botany* between 1948 and 1963 (portrait from Clapham, 1971).

also probably result in the Editor becoming personally liable for all Company debts. The Company's solicitors (Linklaters and Paines) looked further into the difficulty. Their admirably clear reply ([Supplementary Data Item 3](#)) confirmed that the discrepancies were real. The solicitor's view was that although the Memorandum was the problem, the UK Government's Board of Trade would probably not allow key parts to be altered. A way out was found after Brooks, Blackman and the Company's solicitor met with Board of Trade officials. The outcome was that the Company should change its Articles of Association (rather than the Memorandum) in a way that created an Executive Committee within the Company (comprising a Chairman, Vice-chairman and at least one other). This new entity (still extant today) would equate with the terms 'Council of Management' and 'Governing Body' linked to the no-payment clause in the Memorandum of Association. Thus, while no one on the Executive Committee would be paid, other members of the Company (e.g. the Editor) then could. The final wording for the revised Articles of Association was agreed at an Extraordinary General Meeting of the Company on 14 May 1946 (see [Supplementary Data Item 4](#)). This revision remains in force.

The first Executive Committee under the revamped arrangements comprised Fritsch (Chairman), Tansley (Vice-chairman),

Brooks (Treasurer) and Blackman (Secretary until 1950). Further re-arrangements to the Company were triggered by Blackman's resignation as the Editor in 1947. William Harold Pearsall FRS became the new Editor ([Fig. 6](#)). Pearsall, a notable ecologist, had succeeded Salisbury as Quain Professor of Botany at University College London in 1944 ([Clapham, 1971](#)). Pearsall was already an experienced editor, having just stepped down as the Editor of *Journal of Ecology*, and would be the first Editor of *Annals of Botany* to be paid an honorarium (£150 a year, ≡ £4618), as permitted by the 1946 revision of the Articles of Association ([Item 4](#)) mentioned earlier. Pearsall was supported by a newly constituted editorial panel of four 'assisting editors' representing different subjects (physiology, morphology, mycology and genetics), who would not necessarily be (but in practice always were) members of the Company. These assisting editor positions were filled by Brooks, Catcheside, Harris and the physiologist Frederick Gugenheim Gregory FRS, who was a new appointee to the Company (in 1948). The 57-year-old Gregory had followed Blackman as Professor of Plant Physiology at Imperial College, University of London, and was a prolific publisher in *Annals of Botany* (as was Pearsall). From 1948 onwards, membership of the panel of assisting editors appeared in the Journal's front matter, thus

ending the long-standing practice of enigmatically referring to those who helped the Editor in his work simply as 'other botanists'. Also in 1948, Oliver resigned after serving the Journal for a creditable 44 years. He was first appointed immediately after the Annals of Botany Company was constituted (in 1903) and had seen the Journal through both world wars.

The Journal's founding father, Sir Isaac Bayley Balfour, had wanted to attract American botanists to publish in *Annals of Botany* and appointed an Editor for America from the start. However, Balfour's ambition had not been fully realized. The Journal had published very few papers from the USA since World War I and the American editorship position was abolished in 1947, after over 60 years. The Incumbent, A. J. Eames, was said to have welcomed the decision (he presumably had had very little to do).

In contrast to its growing funds (Fig. 4) and improved administrative structure, the size of the Journal had stagnated (Fig. 7). In 1939, it published 56 papers, but by 1950 the Journal managed only 34 papers, a figure little different from the 29 appearing when the war ended. The reason was not paper rationing but a shortage of submissions. In his first report as lead editor, Pearsall stated (in 1949) there had been 30 submissions with seven rejections (a 23 % rejection rate) and six being returned for revision. These were the first rejection statistics to appear in the Journal's records, suggesting that that closer attention was, at last, being given to actual performance. This was lagging well behind major competitors. For example, in 1950, *Annals of Botany* published just 34 papers. By comparison, 107 papers appeared in *American Journal of Botany*, 58 in *Botanical Gazette* (plus book reviews) and 68 in *Plant Physiology*. The closest British competitor, *New Phytologist*, published 35 papers in 1950.

More worryingly, the newly started *Journal of Experimental Botany*, also published by the Clarendon Press and with two Annals of Botany Company members on its Editorial Board (Gregory and Pearsall), had managed 36 papers in its first year. Thus, in the UK, as in America, *Annals of Botany* was by no means the botanical journal of choice. However, any concern over the lack of growth or the marked success of rival journals is absent from the minutes of annual meetings up to this time. The lack of ambition is summed up by a resolution (in 1949) not to allow the Journal to grow by more than 100 pages (equivalent to about six or seven papers). With the Company and editorial panel still dominated by elderly grandees (Fritsch, Blackman and Tansley were all close to 80), attitudes were only likely to change when younger men replaced them.

The minutes of AGMs continued to focus on finance. Thanks to post-war growth in academia generally (rather than to hard work promoting the Journal), subscriptions had increased from their nadir of 373 in 1944 to 827 by 1950 (Fig. 5). Not surprisingly, accumulated wealth grew by 71 % between 1945 and 1950 to £5144 (≡ £153 860) (Fig. 4). The Company moved to avoid paying income tax [about £400 (≡ £13 250) a year] by registering with the UK Government income tax authorities for exemption. This required altering the 1903 Memorandum of Association (Supplementary Data Item 5). The Company also resolved that proceeds of the Trust Fund it opened prior to the war and which had always been free of income tax should be spent on botanical publications such as the *Annals of Botany Memoirs*. The Memoirs were a new initiative designed to

disseminate botanical science in book form rather than in journal form whilst also generating income. The first Memoir, by E. J. Corner, was a definitive analysis of a taxonomically complex group of fungi and entitled *A monograph of Clavaria and allied genera* (Fig. 8). At the time, Corner was Assistant Director of the Singapore Botanic Garden. The Memoir appeared in 1950 and was lavishly illustrated in colour. The 750 copies cost £2028.5 (≡ £64 650) to produce and the cover price was set at £5 and 5 shillings (≡ £152.3), archaically expressed as five guineas (one guinea being 21 shillings or £1.05). The Royal Society helped out with a grant of £150 funded by its 'Parliamentary grant-in-aid for Scientific Publications' scheme. To allow the Memoir to be printed, the Royal Society also negotiated a relaxation of paper restrictions imposed by the Government's post-war austerity programme.

THE YEARS 1951–1960

A somewhat more youthful set of editors and company members (septuagenarians Fritsch, Blackman and Tansley excepted) brightened the prospects for more ambitious management. With the benefit of hindsight, we can see the challenge the Journal faced in terms of needing to attract a greater botanical share of the ~9 % annual increase in the number of scientific articles being published worldwide in the years following World War II (Larsen and Markus, 2010). In contrast to this general upward trend, *Annals of Botany* was barely growing. The number of papers it published in 1951 was still below pre-war levels (Fig. 7) and well below the peak year of 1911 (67 papers). To avoid becoming merely a niche journal it would need to raise its appeal significantly. It would also need to weather deep-seated problems in the British printing industry and sharp rises in cost inflation. Clearly, the future would be a challenging one. The overall impression of the decade from 1951 to 1960 is one of modest improvement.

Changes to management

The set-up in 1951 comprised Fritsch (Chairman), Blackman, Brooks (Treasurer), Gregory, Harris, Hill, Pearsall, Tansley (Vice-chairman), Catcheside (Assistant Treasurer) and Salisbury, with the editorial panel of Pearsall (Editor) assisted by Catcheside, Gregory and Harris. Ten years later, Gregory, Harris, Pearsall and Salisbury still remained with the Company, with Harris (Fig. 9) stepping up to be Chairman from 1954. Alexander Stuart Watt (58 years old), an ecologist lecturing at the University of Cambridge (and FRS from 1957) became Treasurer when Brooks died unexpectedly in 1952. Cecil Terrence Ingold, a mycologist and Professor of Botany at Birkbeck College, University of London, came in for Catcheside as an assisting editor and Company member. The Company was also strengthened by the appointment of the geneticist Kenneth Mather FRS (Sir Kenneth from 1979). Mather also joined the editorial panel. When V. H. Blackman resigned from the Company in 1953, after a remarkably hard-working 32 years, he was replaced by the physiologist Thomas Archibald Bennet-Clark FRS, Professor of Botany at King's College, University of London. Bennet-Clark was made Deputy Chairman in 1957. Fritsch's death in 1954 and the unexplained

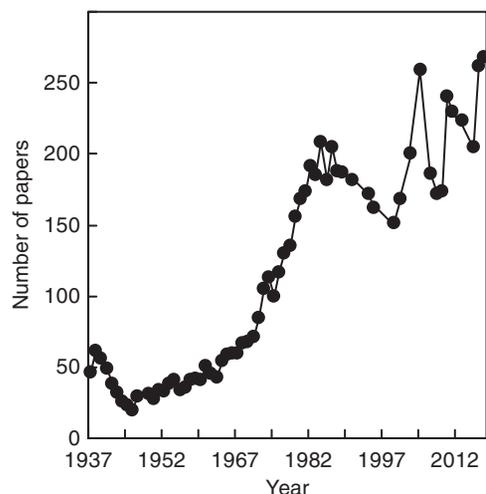


FIG. 7. The number of papers published annually between 1937 and 2012.

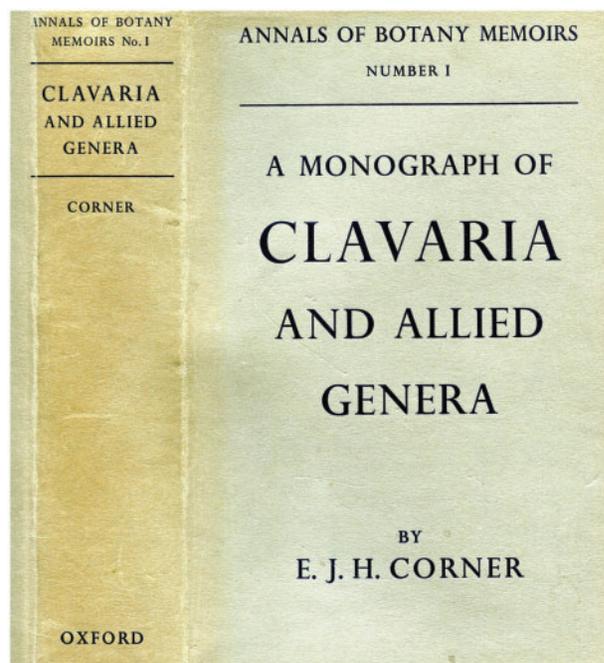


FIG. 8. Dust cover (front and spine) of *Annals of Botany Memoir* No. 1. The Memoir, *A monograph of Clavaria and Allied Genera*, by E. J. H. Corner, was published in 1950 and reprinted in 1967 by Messrs Dawson and Co. This was the first of three Memoirs. The initial ambition was for many more.

loss of T. G. Hill from the Company's membership created places for the physiologist and mathematician William Thomas (Bill) Williams, Professor of Botany at the University of Southampton, and for the botanical polymath John (Jack) Heslop-Harrison (FRS from 1970), a protégé of Pearsall (Gunning, 2000). Heslop-Harrison was Professor of Botany at Queen's University, Belfast, and later became Mason Professor of Botany at the University of Birmingham before being made Director of The Royal Botanic Gardens, Kew (Gunning, 2000). He was influential in the affairs of *Annals of Botany* well into the 1990s and was an Honorary Member of the Company until

his death in 1998. Salisbury retired in 1960 and was replaced by Geoffrey Emmett Blackman FRS. Blackman, an ecological physiologist, was Sibthorpean Professor of Rural Economy at the University of Oxford and the eldest son of V. H. Blackman (the Journal's Editor from 1921 to 1947 (Harley, 1981)). In 1960, Gregory resigned from the Company and his place was taken by Karl Wilson, Lecturer in Botany, and later Professor of Botany, at Royal Holloway College, University of London. Some years later, Wilson wrote a notable account of the founding of *Annals of Botany* (Wilson, 1978). These various appointments show that, despite an underwhelming post-war performance of the Journal so far, it was still attracting some of the UK's leading botanists to its cause, with numerous Royal Society fellows populating the Company's membership (Supplementary data Item 1).

Financial matters

The size of the 1951 and 1952 issues remained much as before (33 and 38 papers respectively) but cost inflation caused the Company to increase subscriptions from £2.0 to £2.5 (≡ £60.91) in 1952. This was the first price increase in 30 years. In 1952, this amounted to charging subscribers £1.6 for each paper published at 2012 prices. By today's standards this appears good value. For comparison, each paper in the 2012 volume of the Journal cost subscribers £2.73 if a year's issue was bought by a university library in hard copy only (Fig. 10). Production costs continued to rise after 1952 and subscriptions were increased again, to £2.75 (≡ £43.60) 4 years later. In 1959, the Press increased its overhead charge from 10 to 12.5 % of sales income. To compound the squeeze on margins, three issues rather than the normal four appeared in 1960 because of a nationwide 6-week-long strike in late 1959 (Website 1) called by the National Graphical Association (the printers' trades union). The resulting wage agreement forced a third increase in the subscription price in 1960 to £3.50 (≡ £68.24). Overall, there had been a rise in the subscription price of 75 % in 10 years. The 1950s also saw the number of subscribers to the Journal continue to grow (Fig. 5), increasing by 48 % (from 784 to 1159) over the decade. The additional income accruing from sales of back issues, authors reprints, Memoirs and investments more than offset the extra costs, giving a 60 % rise in reserves from £4215 in 1951 to £6770 by 1960 (Fig. 4), although inflation over the decade meant that the purchasing power of the Company's funds rose by only 9 %. The Company's wealth was not excessive. For example, in 1953, £4508 accumulated wealth included only about £2900 of liquid assets – equivalent to about 1 year's total production costs (£2795). It could be argued that this was an uncomfortably small buffer to cover the risk of keeping the Journal going in the event of the publisher failing or unexpectedly serving its contractual 6 months notice to quit.

Ten years after the launch of *Annals of Botany Memoirs* in 1950, the original Memoir by E. H. Corner remained the only Memoir. Invitations to F. G. Richards and F. C. Steward, amongst others, to write new ones were unsuccessful. The first Memoir (Fig. 8) had generated a modest profit (about £675, ≡ £13 160). Five hundred and twenty-four copies had been sold, leaving 226 still to sell, with many needing binding. The

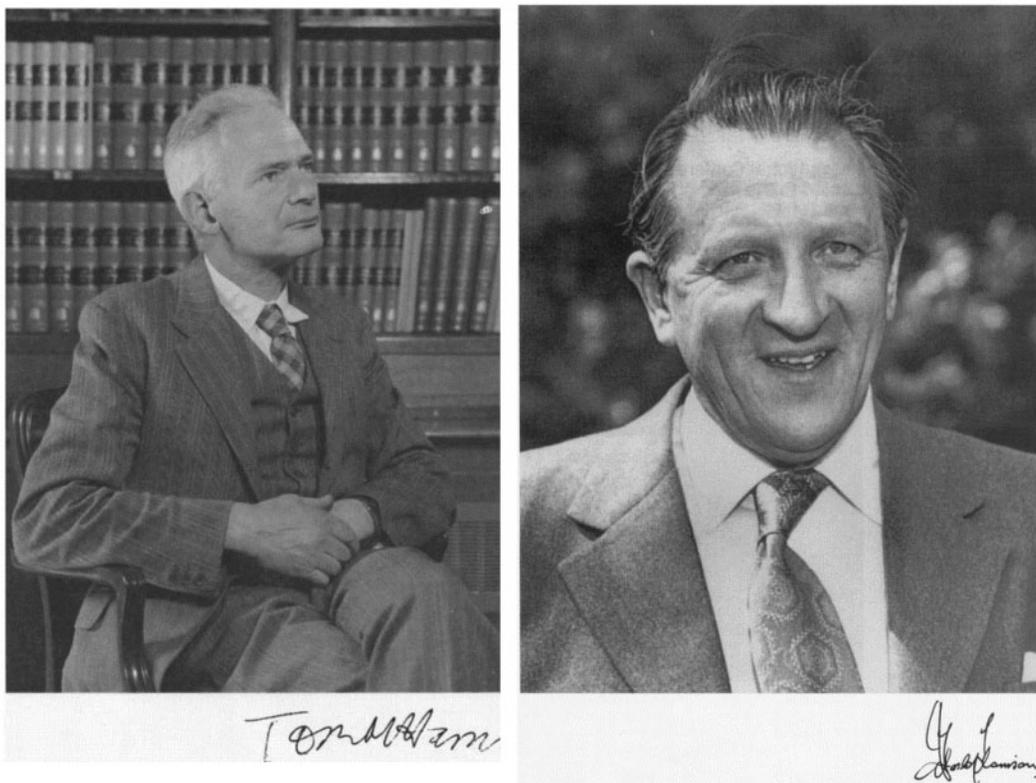


FIG. 9. Thomas Maxwell Harris FRS (left) and John ('Jack') Heslop-Harrison FRS (right). Harris was Chairman of the Annals of Botany Company from 1954 to 1961 (portrait from Chaloner, 1985). Heslop-Harrison was the Editor or joint Editor of *Annals of Botany* from 1961 to 1967, Chairman of the Annals of Botany Company from 1971 to 1984 and Honorary Member of the Company from 1985 to 1998 (portrait from Gunning, 2000).

Clarendon Press (who handled the sales) pointed out that the costs of storage, advertising and dispatch spread over such a long time had made it uneconomic despite the small profit. However, Memoirs were still seen as desirable by the Company and in 1955 it was resolved 'To consider publishing at intervals Memoirs representing a valuable, large and permanent contribution to botanical science'.

Since 1945, storing, parcelling, dispatching and billing for sales of back issues more than 5 years old was the responsibility of the Company. This was irksome and amateurishly managed. The Company was paying Cambridge University laboratory staff 7 shillings an hour (\equiv £6.90) for their informal help. The Old Series was for sale at only £2 (\equiv £40) for the 50-volume set. In 1959, these *ad hoc* arrangements were replaced by contracting William Dawson and Sons to do the work for a return on sales to the Company of 75%. The firm would also reprint out-of-print volumes by photographic reproduction and pay the Company 15% of the cover price for each copy sold.

Changes to the Journal and its operations

In 1960, the Journal was still not printing receipt and/or acceptance dates on each of its published papers. This makes it impossible to see how long papers were taking to work through evaluation and production. However, sketchy AGM minutes indicate it was taking approximately 7 months for accepted papers to appear following receipt at the Clarendon Press. Total

time from submission may therefore have exceeded 1 year. Whether outside referees were consulted or whether the editorial panel evaluated all content themselves is not clear. Overall, the balance of topics published in the Journal favoured physiology and experimental botany, with morphological and anatomical papers a close second. At no time did the Journal attempt actively to favour any areas of botanical research over others. Acceptance rate data are scarce. The 1956 AGM mentions that one-third of submissions were rejected. However, only 10% were turned down the following year.

Comparisons with competitor journals from America show a widening gap. In 1961, *Annals of Botany* published 43 papers (Fig. 7), an increase of only 12 papers since 1950. Over the same time, *American Journal of Botany* had increased from 109 papers to 131, while *Plant Physiology* had almost doubled its size, from 69 papers to 136 papers. *Annals of Botany* was, however, not alone in struggling for market share. The *Botanical Gazette* had published just 39 papers in 1961, much the same as in 1950. The size of rival British journals was also little changed, *New Phytologist* publishing 28 papers, six less than in 1950, and *Journal of Experimental Botany* publishing just five more than in 1950. Most papers in *Annals of Botany* came from the UK, with very few from the USA.

Front covers were important since they drew attention to the latest issue as potential readers inspected the most recent journals displayed side by side in their institutional libraries. However, the front cover of *Annals of Botany* had changed little since 1910 (or even since 1887) and was not in the least eye-catching. But,

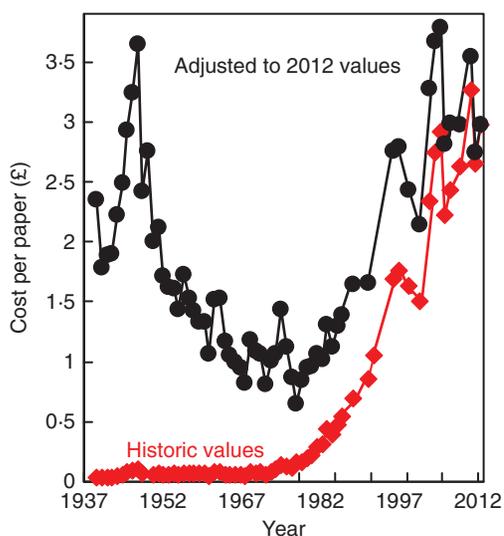


FIG. 10. Calculated mean cost to subscribers of each paper published by *Annals of Botany* in individual years from 1937 to 2012. Values were obtained by dividing the cost of a year's subscription in the UK by the number of papers published in the same year. The graph gives values before and after adjusting for consumer price inflation to 2012 using Officer and Williamson (2014).

in 1957, the out-of-date design was replaced by an admirably uncluttered layout that used coloured ink for the first time (brown printing on a grey background). The fussy and impractical Roman numbers for volume numbers were also abandoned and replaced with standard Arabic ones (Fig. 3). Not before time, *Annals of Botany* was becoming a little more image-conscious.

THE YEARS 1961–1970

The 1960s saw *Annals of Botany* evolving and growing more rapidly thanks to the efforts of a more strategically inclined and forward-looking management. The increasingly lengthy minutes of Annual Meetings show a greater concern for performance, speed of publication, quality of the science and effective advertising, especially in the USA, for which a new publicity leaflet was commissioned in 1963. Overall, the 1960s were rewarding years for the Journal.

Changes to management

At the start of the decade, the Company comprised Bennet-Clark, Blackman, Harris (Chairman), Heslop-Harrison, Ingold, Mather, Pearsall, Watt (Treasurer), Williams and Wilson. Heslop-Harrison and Pearsall were joint Editors, assisted by Harris, Ingold and Mather. New entrants in the next years created a more performance-conscious management made up entirely of post-war appointees. Watt was the first to resign (1961) and Wilson replaced him as Treasurer. When Harris retired from the Company in the same year, Ingold (Fig. 11) was made Chairman. The replacement members were Robert Brown FRS and Norman Alan Burges. Brown, a physiologist, cytologist and former student of Gregory, was Regius Professor of Botany at Edinburgh University (Yeoman, 1999), a position once occupied by Sir Isaac Bayley Balfour, the founding father of *Annals of Botany*. Burges, an Australian by birth, was a mycologist and

ecologist, and Professor of Botany at the University of Liverpool. Later, he became the first vice-chancellor of the newly started University of Ulster in Northern Ireland (Website 2). When Pearsall died in 1964 (Clapham, 1971), Heslop-Harrison (Fig. 9) was made sole Editor. The same year, Bennet-Clark resigned. The first of the two vacancies was filled by the algologist and freshwater biologist John Walter Guerrier Lund FRS. The second was filled by the electron microscopist and biochemist Reginald Dawson Preston FRS, Professor of Botany at the University of Leeds, who was also an Associate Editor of the *Journal of Experimental Botany*. The loss of Williams from the Company in 1965 (he had left to take up a position in Australia) made way for the hormone physiologist and biochemist Leslie John Audus, Hildred Carlile Professor of Botany at Bedford College, University of London. In that same year, Audus also became the Editor of the *Journal of Experimental Botany*. A year later, Mather retired from the Company. The vacancy was temporarily unfilled.

The disarmingly informal organization of the Journal at the time was well illustrated in 1967 by a breezy letter from the outgoing Editor, Heslop-Harrison, to the new incumbent, James Frederick Sutcliffe (Fig. 11). Heslop-Harrison had relinquished his post at Birmingham to take up an academic position in America. Sutcliffe had been Reader in Botany under Bennet-Clark at King's College, University of London, and in 1965 was appointed the first Professor of Botany at the then new University of Sussex. The letter arranges a handover meeting and includes the following throwaway lines 'I wonder if you could bring along a suitcase (don't take fright at this). I will have to hand over what is effectively a filing system.' Despite this alarmingly casual start, the appointment of Sutcliffe in 1967 heralded a 16-year golden age for the Journal. Informal arrangements did, however, persist. Editing work was done by Sutcliffe from home with help from his wife and others (see below), with his departmental secretary helping out in her spare time for £30 a year (\equiv £359).

From the inception of the *Annals of Botany* Company in 1903, its existence and make-up went unrecognized in the Journal itself for very many years. The names of the Editor and any assisting editors had been listed since 1948 but without reference to their membership of the Company and with remaining members going without a mention. Company membership, as a whole, only emerged from the shadows in 1962, when the panel of assisting editors (conceived in 1947) was scrapped and, instead, all members of the Company were listed automatically in the front matter of the Journal as assisting editors. However, there was still no mention of any connection between this list and the Company! Readers of *Annals of Botany* would have been forgiven for thinking the Journal to be wholly owned by the Clarendon Press. In truth, the Clarendon Press was simply contracted to publish, market and distribute the Journal for a fee. In 1975, the existence of the Company and its membership were finally acknowledged in the printed Journal, but, even as late as 2012, the Company was still choosing not to point out that it actually owned the *Annals of Botany*.

Financial matters

Subscriptions grew from 1209 in 1961 to 1687 in 1970, an increase of almost 40 % (Fig. 5). The cost of subscriptions also

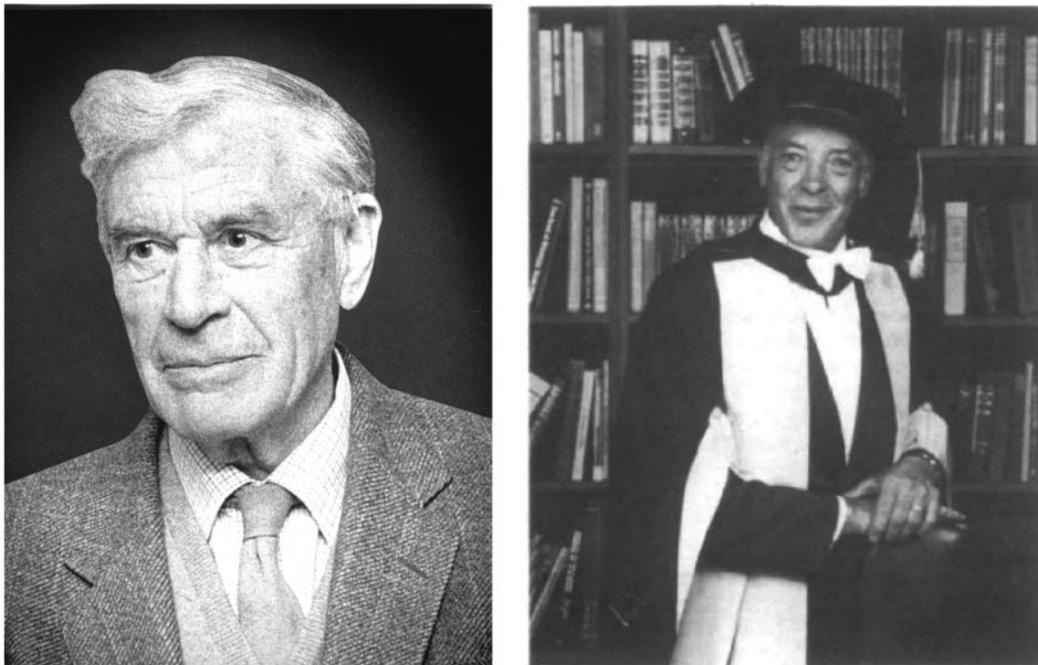


FIG. 11. Cecil Terence Ingold and James Frederick Sutcliffe. Ingold (left) was Chairman of the Annals of Botany Company from 1962 to 1971 (portrait from Money, 2012). Sutcliffe (right) was the Editor of *Annals of Botany* from 1967 to 1973 (portrait from Anonymous, 1984).

increased. The price had been raised to £3.5 a year (\equiv £70) as recently as 1960, but several further increases were levied over the next 10 years and subscription reached £6.5 in 1969 (\equiv £98) (Fig. 12). These steep increases, compared with earlier times, were partly the outcome of the growing size of the Journal (560 pages in 1961, 1153 pages in 1970) and thus of rising production costs. The latter grew markedly, especially towards the end of the decade (£7273 in 1967, £9344 in 1968 and £11 619 in 1969). There had also been a large pay award to workers of the print industry in 1962 that added 7.5 % to production costs and a substantial overall increase in the publisher's charges. Despite these fiscal challenges, the cost to subscribers per paper published fell throughout the 1960s from approximately £1.50 to about £1 a paper (Fig. 10) (values adjusted for inflation). This continued a clear trend of increasing value from the end of World War II to the late 1970s. This was achieved through increasing numbers of subscriptions (Fig. 5), increasing numbers of papers published (Fig. 7) and a 'charitable' subsidy from the Company in years when production costs exceeded subscription income.

As the Journal expanded early in the decade (Fig. 7), the Editor (Heslop-Harrison) needed help with the extra work involved. This was provided by his wife (and research collaborator), Yolande Heslop-Harrison, who, from 1963 to 1967, was the Journal's first Assistant Editor and paid an annual honorarium of £100 (\equiv £1773). At the time, the Editor was receiving £200 (\equiv £3546). A similar set-up was arranged for Heslop-Harrison's successor, James Sutcliffe. His wife too, being the Assistant Editor, initially receiving £150 (\equiv £2305) a year. By 1972, growth in submissions was beginning to strain their capacity to cope and further help was then required in the form of an additional part-time secretary working 4–5 h a week.

Government stock or secure loans and together with bank balances and the Trust Fund gave a total wealth in 1970 of £15 460 (\equiv £215 200), an increase of almost 99 % in unadjusted terms since 1961. The Company's reserves thus continued to grow (Fig. 4), although annual production costs also rose by a similar amount [from £6290 (\equiv £111 500) in 1963 to £13 124 (\equiv £157 100) in 1971]. Thus, if all financial assets were converted into cash, the Company could probably have run the Journal for about a year if its publisher failed or terminated its contract abruptly – a still uncomfortably small cushion.

The Company's first Memoir, published in 1950 (Fig. 8), continued to sell steadily and by 1966 all the stock had been sold, with an overall financial loss of approximately £310 (\equiv £4889). To meet further demand whilst avoiding extra expense, Messrs Dawson (who were already reprinting and selling back issues of the Journal) agreed to reprint Memoir No. 1 photographically without charge and pay the Company 15 % on sales. In the same year Corner produced a second Memoir, the 240-page *A monograph of Cantharelloid fungi*. Fifteen hundred copies were printed and bound for the Company by the Clarendon Press at an overall cost of £2171 (\equiv £34 240). Each would sell for 6 guineas (£6 and 6 shillings, \equiv £99.36). Despite the considerable production expense, the Company almost simultaneously embarked on a third and even more costly Memoir (comprising 550 pages and 150 plates) written by J. G. Hawkes and J. P. Hjerting and entitled *The potatoes of Argentina, Brazil, Paraguay and Uruguay*. The final cost of producing 1250 copies of this third Memoir was £6347 (\equiv £100 000), equivalent to over half the Company's total financial assets (Fig. 4). Blackman strongly opposed spending such a large proportion of the accumulated funds. Nevertheless, the company went ahead and Memoir No. 3 appeared in March 1969 priced

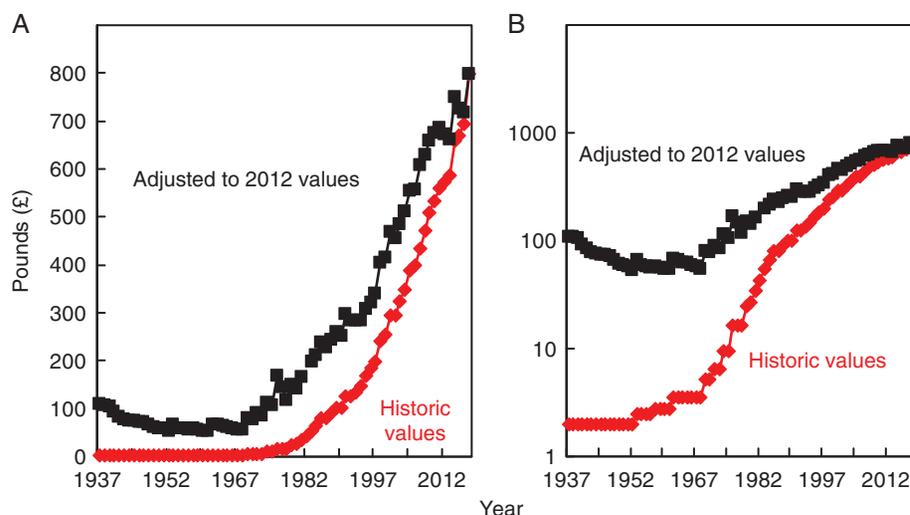


Fig. 12. Changes in the cost of 1 year's subscription to the printed version of *Annals of Botany* from 1937 to 2012. Each graph gives the historic subscription price and the price after adjusting for consumer price inflation to 2012 values using Officer and Williamson (2014). Graph A uses a linear scale to clarify the adjusted values. Graph B uses a log scale to clarify early changes to historic values. After the late 1990s, pricing was made more complex by the introduction of electronic versions and the emergence of consortial package deals where the cost of an individual journal to many individual libraries became unknowable.

10 guineas (£10 and 10 shillings, \equiv £146.30). No substantial dip in the Company's reserves is apparent in the accounts because the value of stock was included in the assets. The Company anticipated making a financial loss on Memoir No. 3 but saw this as compatible with its charitable aim of working for the general benefit of botanical science. But publishing it undoubtedly put the Journal at risk should its publisher fail or withdraw its services.

Changes to the Journal and its operations

Signs of active micro-management of the journal, much needed for so long, are evident throughout the 1960s. For example, after almost 80 years the Company commissioned its first official headed notepaper (!) and updated the style of literature citations to bring it into line with that used by *Journal of Experimental Botany* and other journals. It also began printing an accepted date for each paper from 1969 (this changed to printing only the received date in 1971). The front cover, updated last in 1957, succumbed to an unflattering utilitarian redesign in 1962, when the contents list was placed on the front. This arrangement lasted until 1971, when the contents were placed elsewhere and a more stylish green and white front cover was introduced (Fig. 13). Poor standards of presentation of submitted manuscripts prompted a revision of the Instructions to Authors in 1963, and in the same year resolution and clarity of photographic reproduction were improved in an attempt to attract electron microscopy papers away from German or American journals, which were offering superior image quality.

Rejection rates begin to appear spasmodically in AGM records. External refereeing was mentioned for the first time in 1964, when submissions were reported to take 7–8 weeks to be evaluated, on average. Of the 77 manuscripts received that year, 16 were rejected (21 % rejection rate) and 13 required major revision. Publication of an accepted manuscript took

almost 7 months from submission if no revisions were needed but 13 months if papers required revisions. For comparison, papers in *Plant Physiology* were taking 6–8 months from submission. By the end of the decade, the Journal's rejection rate and the Press's processing times had not improved very much. Refereeing policy was clarified for the first time in 1969. Sutcliffe's practice was to send all papers outside his own field of expertise to one independent referee. An unfavourable report would then prompt a second outside opinion before a final decision was made. How long this had been the usual practice is not known, but it falls far short of current standards.

The number of papers published each year had risen from 28 in 1950 to 43 in 1961 and to 105 by 1970 (an increase of 144 % in 10 years). A milestone was passed in 1968, when the tally of papers (71) overtook the previous highest total of 67, achieved 57 years earlier (in 1911) (Fig. 7). There were now enough papers to fill five issues a year instead of four (from 1968). At last, the Journal was gaining more adherents. Papers on physiology and biochemistry predominated as usual, but morphology papers were increasing as a result of the popularity of electron microscopy. About half the papers published came from the UK, but only about five a year came from the USA. To attract more authors and subscriptions, especially from America, a new and rather striking publicity flier appeared in 1969 (Fig. 14).

Annals of Botany was increasingly well managed and prospering on the back of unprecedented growth in university education and research, especially in the English-speaking world. For example, in Great Britain 23 additional universities were created between 1958 and 1961, more than doubling the number overall (Website 4). In Canada, 21 new publically funded universities were started in the 1960s (Website 5) and Australia added seven to its existing stock of 22 (Website 6). Of course, *Annals of Botany's* competitors also benefitted from this upsurge with its two major British competitors, *New Phytologist* and *Journal of Experimental Botany* (107 and 108 papers, respectively). By 1971, both these journals had grown to much

the same size as *Annals of Botany* (105 papers). The direct American rival, *American Journal of Botany*, was still larger than *Annals of Botany* but managed to grow by only 13 % over the decade. *Plant Physiology* continued to dominate the publication of peer-reviewed plant science. By 1970, it was more than three times the size of *Annals of Botany*, having increased by 53 % to 345 papers a year in 10 years (cf. *Annals of Botany*, which had grown by a creditable 144 %). In the same 10 years, West Germany's general botanical journal *Planta* (started in 1925) had transformed itself from a predominantly German language journal into one with fashionable international appeal. Publishing mostly in English, it was beginning to rival *Plant Physiology* thanks to its high standards of presentation, emphasis on physiology, cell biology and biochemistry, and to its ability to publish papers quickly. *Planta* published 210 papers in 1970, a rise of 162 % in 10 years. In the previous century, German botanical science had been the model that inspired the founders of *Annals of Botany* as young scientists. Eighty years later, German botanical publishing, in particular *Planta*, was the model the mid-twentieth-century managers of *Annals of Botany* would have done well to emulate while hopefully avoiding *Planta's* notoriously high subscription rates.

TWELVE YEARS OF THE SUTCLIFFE EDITORSHIP (1971–1983)

By 1971, Sutcliffe had already been the Editor for 4 years and would continue to oversee considerable expansion of the Journal. In the early 1970s, the long-standing annual lunch at Browns (an upmarket Mayfair hotel in London) and afternoon AGMs at the nearby Linnean Society's historical rooms on Piccadilly were abandoned in favour of the meeting rooms and catering facilities at Dodge's Royal Holloway College, University of London. Although a seemingly utilitarian move, the college, founded at much the same time as *Annals of Botany*, exudes 19th-century grandeur (Website 7). The Company thus continued to meet and dine in considerable style. The highly successful 12-year period to 1983 ended with Sutcliffe's untimely death at the relatively early age of 61. This forced an urgent and comprehensive overhaul of the Journal's operations (see below, The 1983 Crisis). A set of six papers in recognition of Sutcliffe's contribution to plant science was published in *Annals of Botany* in June 1986.

Changes to management

The management line-up at the start of 1971 was Ingold (Chairman), Wilson (Secretary and Treasurer), Sutcliffe (Editor), Audus, Blackman, Brown, Burges, Heslop-Harrison, Lund and Preston. Ingold resigned from the Company in 1971 after 18 years and Heslop-Harrison was made Chairman. The vacancy was filled by the pteridophyte botanist Peter R. Bell, Professor of Botany at University College, University of London. At this time, Sutcliffe found that he and his wife now needed extra help with editorial office work. Accordingly, a part-time editorial assistant and a part-time secretary were appointed in advance of Sutcliffe taking a sabbatical leave in 1972. It was also resolved to refresh membership of the Company more regularly by changing

one member each year. Although this principle was never kept to, the first to go was Burges (after 15 years with the Company). He was replaced in 1976 by the palaeobotanist William Gilbert Chaloner FRS, Professor of Botany at Royal Holloway College, University of London. Brown departed the same year and was replaced by the crop pathologist John Malcolm (Jim) Hirst FRS, Director of the Long Ashton Research Station and University of Bristol's Professor of Agriculture and Horticulture. When Wilson, the Secretary/Treasurer, resigned in 1977 after 13 years, he was replaced by the phycologist John David Dodge, Wilson's successor as Professor of Botany at Royal Holloway College. Blackman and Preston had left the Company by 1979 (after 19 and 15 years respectively) and were replaced by the physiologist John Eggerton Dale from the University of Edinburgh and the crop physiologist Gillian N. Thorne from Rothamsted Experimental Station, Harpenden (the world's first agricultural research institute). Thorne had the distinction of being the first female member of the Company. The next year, Lund stepped down after 15 years, and in 1982 Bell resigned after 10 years. The population ecologist John Lander Harper FRS, Professor of Agricultural Botany at Bangor University, University of North Wales, then joined the Company.

Changes to the Journal and its operations

The 12-year period to 1983 opened vigorously with 15 000 copies of a promotional leaflet being distributed by the Clarendon Press, mostly in the USA. A new front cover to the Journal appeared in January 1971. It was a simple and uncluttered affair (Fig. 13) although a few years later, when the back cover became too small to list all the papers, Short Communications were listed on the front, arguably spoiling its looks and emphasizing the least important papers (Fig. 13).

The Clarendon Press abandoned after over 80 years.

The British economy and many of its traditional industries were in rapid decline in the late 1960s and 1970s. Cost inflation, devaluation of the pound sterling, increased unemployment, industrial unrest, continued exclusion of the UK from the European Economic Community (forerunner of the European Union) and widespread industrial under-investment made it difficult for British companies to compete internationally. This was especially so for inflexible, vertically integrated operations such as Oxford University Press (owners of the Clarendon Press) with its paper mill, foundry, hot metal press, bindery, two publishing houses and a string of offices at home and abroad (Louis, 2013). Shortcomings in the performance of the Press had been clear to the Journal for some years. Complaints included: late issues; slow processing; limited production capacity (illustrated by a forced rescheduling of publication to avoid a printing overlap with *Journal of Experimental Botany*); long delays to authors' reprints (an external printer was needed to cope) and delays to annual accounts. Matters came to a head in 1972 with complaints of lacklustre publicity, irregularities in the annual accounts, late journal delivery, steeply rising production costs (36 % in 1970/71) and delays in processing subscriptions. In 1972, the Company was forced to sell part of its

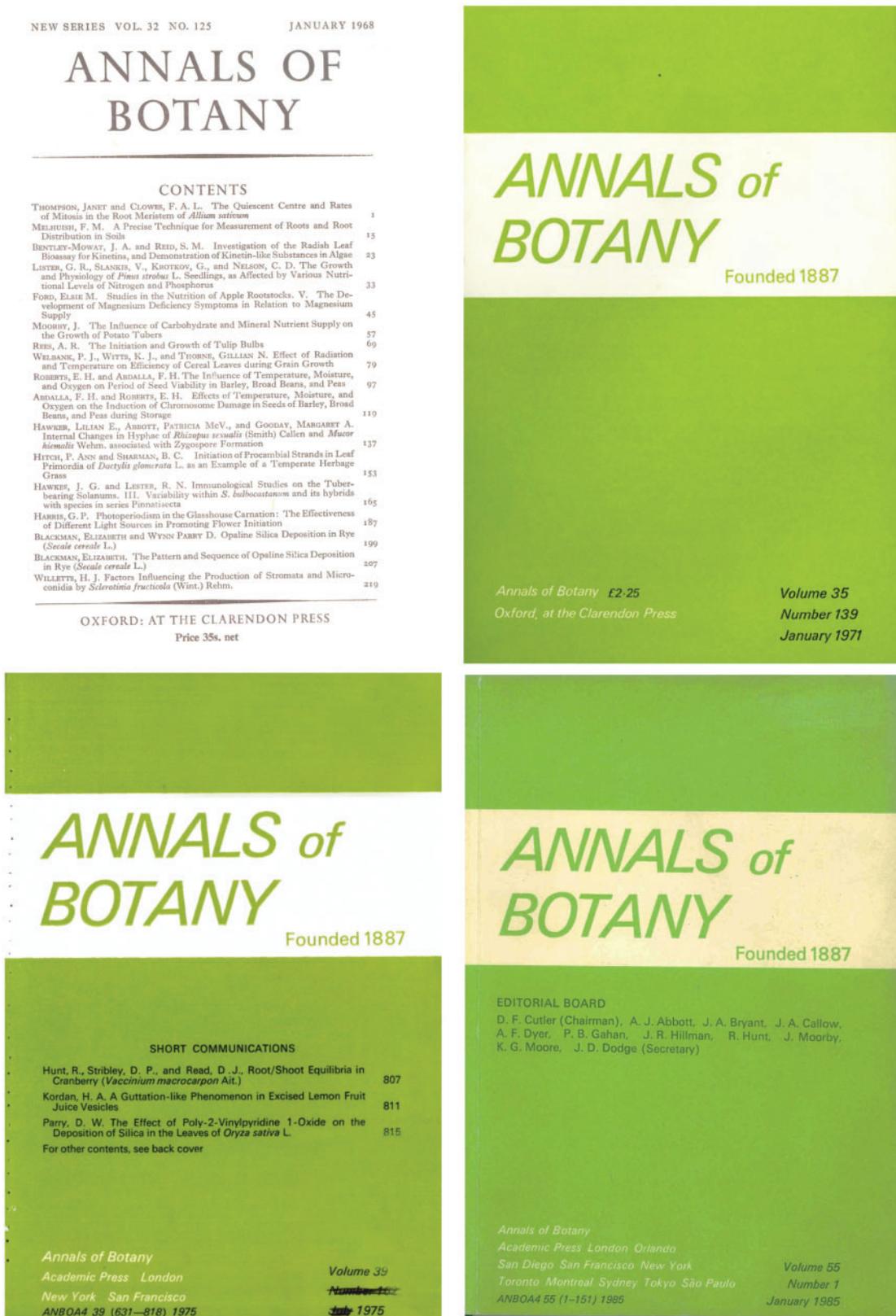


FIG. 13. Front cover designs for *Annals of Botany* in use from 1962 until 1997. (Top left) Cover used from 1962 to 1970. (Top right) Cover used from 1971 to 1973. (Bottom left) Cover introduced in 1974 by Academic Press and used until 1984. (Bottom right) Cover used from 1985 to 1990. The dimensions of the Journal were approximately 7 inches \times 10 inches (17.8 cm \times 25.4 cm).

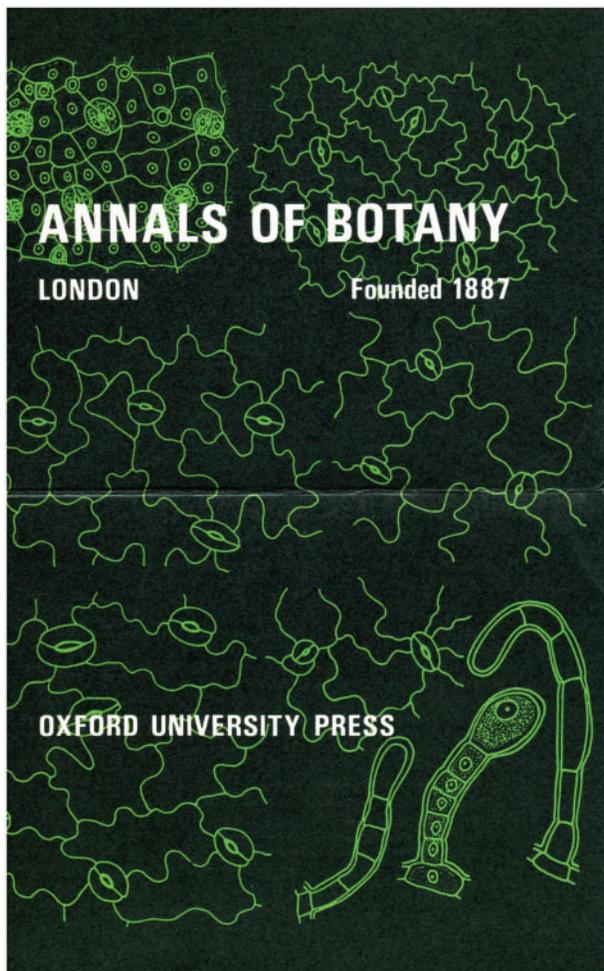


Fig. 14. Front cover of promotional flier prepared by the Clarendon Press in 1969. It was aimed primarily at American botanists.

'Charifund' investment to pay £2900 (≡ £32 400) to the Clarendon Press for its unexpectedly high charges. The mounting difficulties induced the Company's Executive Committee (Heslop-Harrison, Sutcliffe and Wilson) to open discussions with the American-owned publisher Academic Press (a part of Harcourt Brace Jovanovich). Reasons for choosing Academic Press are unknown but the approach resulted in detailed proposals being submitted by Academic Press UK. The December 1972 Company AGM amended these ([Supplementary data Item 4](#)) and, after further negotiations and changes, they were approved at a Special Meeting of the Company on 25 July 1973. Notable features included Academic Press taking responsibility for proof-reading (the Editor had done this up to then), paying editorial costs and honoraria, handling the accounts, storing, managing and marketing, indemnifying the Company against any financial losses and giving 25 % of annual profits to the Company. The Contract with Academic Press was for 3 years and would be renewed automatically unless 6 months notice or more was given by either side. Because there was a similar 6-months notice clause in the letters of agreement with the Clarendon Press, the Journal had to delay switching production by Academic Press to January 1975. Despite the extra time

this delay made available, very few tangible improvements were made to the Journal other than to raise the quality of paper, rationalize the index and increase the number of issues from five to six a year. Disappointingly, the cover remained much as before (Fig. 13), as did the internal layout. Minor adjustments included the addition of the now familiar key words to manuscripts (1975). This would have been the ideal moment to follow the example of *Planta* and American journals such as *Plant Physiology* and adopt a large two-column format. *Annals of Botany* would, of course, come to this eventually. Academic Press did at least produce a new promotional leaflet and, thanks to new technical developments at the printers (Cambridge University Press), half-tone figures now appeared within the text rather than being grouped awkwardly as plates at the end of articles. In the Journal itself, the *Annals of Botany* Company *per se* was, for the first time, named in the Journal and all of its members were listed.

Under Sutcliffe's editorship, the Journal had grown at an unprecedented rate from 1968 to 1971 (Fig. 7) and the trend continued. Between 1971 and 1983, the number of papers appearing each year increased from 113 (itself a record) to 205, with about 40 % coming from the UK. Short Communications (introduced in 1975) proved popular at first and contributed about 17 % to the total. After many years of being largely ignored by American authors, 1982 saw 20 % of the papers coming from the USA. As a reaction, an Editor for America was appointed in 1977 (the last such editor had left 30 years previously). The appointee was Abraham D. Krikorian, a developmental physiologist from the University of Cornell. Initially, he was paid \$500 a year (≡ \$2020 or £1362) plus his secretarial and postal costs. Perhaps because of the substantial and rising workload, Krikorian resigned after only 4 years.

Overall, about 60 % of the papers published were physiological or biochemical, while ecological papers were rare. By 1979, the Journal was publishing 12 issues annually rather than the usual five or six. This would have helped to shorten the time for accepted papers to appear. To help avoid unwieldy annual bound volumes, each year's output was split into two volumes of six issues. These arrangements still stand. The Journal had expanded sufficiently fast (205 papers appeared in 1983) to outpace its British counterparts (*Journal of Experimental Botany*, 168 papers; *New Phytologist*, 170 papers) and also its American equivalents (*Botanical Gazette*, 81 papers; *American Journal of Botany*, 180 papers). *Annals of Botany* had also drawn closer to *Planta* (232 papers), which had grown comparatively little in the 10 years to 1983. *Annals of Botany* had clearly more than made good its competitive weakness, evident as far back as the 1920s. However, the success was dwarfed by that enjoyed by *Plant Physiology*, still the dominant plant science journal of the times. It had grown by approximately 70 % in 10 years (it contained 587 papers in 1983) and was thus almost three times the size of *Annals of Botany*. Its success had prompted some European plant physiologists, spearheaded by Anders Kylin (Chief Editor of the Scandinavian journal *Physiologia Plantarum*), to try to emulate this success in Europe. Kylin proposed amalgamating *Journal of Experimental Botany*, *Physiologie Végétale* and *Physiologia Plantarum* into a *European Journal of Plant Physiology* and wanted physiology papers from other European botanical journals such as *Annals of Botany* to be redirected to the new journal. The *Annals of*

Botany Company rejected the proposal in early 1975, as did all the other journals that Kylin approached. Nevertheless, the spirit of the idea successfully underpinned the setting up of the Federation of European Societies of Plant Physiology (Lichtenthaler, 2004). Dale was its first Secretary General (1978–1984). The increasingly international character of plant science research was evident from this development, but also from the spread of countries from which papers published in *Annals of Botany* originated. Only eight countries were represented in 1937 (all but one being in the British Empire), but by 1971 the number of countries had increased to 21 and in 1983 principal authors from 39 countries contributed papers, with the proportion from the UK falling from approximately 50 % to 40 % over the 12 years.

Such was the increase in Sutcliffe's workload that two additional editors were appointed in early 1982 to share the editorial burden. The appointees were John A. Bryant, a biochemist at the University of Cardiff, and Anthony John Abbott, a physiologist at Long Ashton Research Station, the University of Bristol's Department of Agriculture and Horticulture. Each was paid an annual honorarium of £500 (≡ £1494) and up to £350 in expenses, the latter being covered by the publisher, not the Company. Neither Abbot nor Bryant was made a member of the Company at the time.

Editorial selectivity of submissions improved considerably in the 10 years from 1971, although the speed of evaluation slowed. Thus, in 1971 the rejection rate was only 13 % but it had grown to 46 % by 1982. Processing of received manuscripts took approximately 9 months in January 1971 but by 1975 this had stretched to about 10.5 months and to 12 months by 1978. Comparable statistics after 1978 are difficult to obtain because in 1979 the Journal stopped publishing the date manuscripts were received and went back to the less revealing practice of printing only the date of acceptance. Academic Press must take some blame for the slowness, with an average time between acceptance and publication in excess of 8 months (January 1982). Short Communications were somewhat faster. Book reviews were restarted in 1979 and were the first to appear in *Annals of Botany* since 1889. They remain a feature of the Journal.

Financial matters

Despite a difficult financial start to the decade (indicated by an overall trading loss of £2358 and the need for a 46 % increase in the subscription price in 1971), authors were still not charged to publish even lengthy papers and only rarely were they asked to help defray the costs of photographs. This was in keeping with the Company's default charitable stance. This is illustrated by the yearly accounts showing that production costs sometimes exceeded subscription income. For example, 1970 production costs were £11 791 but subscription income was £1878 less than this. In 1971, production costs were £16 061 but subscriptions brought in £4170 less. The difference, arguably a charitable donation, was covered by investment income or by spending capital. The net financial outcome was an irregular increase in total accumulated wealth to 1983 (Fig. 4). The UK's cost of living inflation was already 9.4 % in 1971; it rose to a record 24.2 % in 1975 and remained in double figures until 1982. To cope, the cost of a year's subscription rose

frequently in the years to 1983. A subscription was £9.50 (≡ £114) in 1971 but £80 (≡ £228.60) by the end of the period (Fig. 12). Thanks to these increases and to inflation-linked investment income, the Journal's financial assets continued to expand to a level that, by 1977, was considered by the Company to be unacceptably high (e.g. £28 857, ≡ £151 900) (Fig. 4). Accordingly, measures were taken to spend some of the surplus by subsidizing the cost of colour plates (these were normally £250 per plate, ≡ £1315). Spending was also increased by publishing themed issues by single authors (called 'Supplements'), hopefully every 2–3 years. These would be free to subscribers and thus in keeping with the charitable aims of the Company. Heslop-Harrison wrote the first Supplement, entitled 'Aspects of the structure, cytochemistry and germination of the pollen of rye' which appeared in December 1979. Its 47 pages cost £1842 (≡ £7890) to produce. Supplement No. 2, by F.C. Steward et al., 'Growth, form and composition of potato plants as affected by environment', was of similar size and cost and would appear 2 years later. A third Supplement in the same monograph style was planned for 1984. Despite the extra spending on Supplements, the period continued to be profitable. By 1983 funds and investments totalled £93 389 (≡ £362 529), a 6-fold increase since 1971. Although inflation reduced the value of the increase considerably (Fig. 4) it was a notable achievement in an era of strongly rising costs and currency inflation. However, the increase in reserves had by no means outstripped the costs of production and still covered little more than 1 year's worth (about £75 000, ≡ £224 100).

Monetary inflation in the 1970s led to a continually increasing remuneration for the Editor (Sutcliffe). This amounted to £450 (≡ £5027) in 1971 and to £1650 (≡ £5991) by 1980. For 10 years from 1967, Sutcliffe was paid these sums while also being re-appointed each year as one of the three Executive Members of the Company. However, this practice was in error since, as explained earlier, the 1946 amendment to the Company's Articles of Association allowed payments only to members of the Company outside the Executive. This meant that Sutcliffe had, unwittingly, been carrying personal unlimited liability for the Company's debts for several years. When, in 1977, this administrative mistake was discovered, Sutcliffe was replaced on the Executive by Audus and the title of his position changed from 'Editor' to 'Editor in Chief' (a short-lived terminology).

Although subscriptions had enjoyed year-on-year growth since the end of World War II (Fig. 5), numbers started to decline in the early 1980s (1726 in 1971, 1825 in 1978, the peak year, but down to 1512 by 1982). This was part of an across-the-board loss of journal subscriptions experienced by academic publishers as universities and research organizations began to rationalize their institutional and library arrangements. For example, at the University of Oxford it was possible to find *Annals of Botany* in at least three separate libraries, each no more than 5 minutes' walk apart. Lack of integrated provision such as this was in decline.

The Memoir series of expensively produced books was in trouble. Academic Press tried to push sales of Memoir No. 3 by sending out 10 000 leaflets, but to little effect. The Memoir had been expensive to produce and early sales had been disappointing (39 in 1969/70 and only 19 in 1972). The preceding two Memoirs were also moving slowly, with 19 and 37 copies

respectively being sold in 1972. It was decided not to publish any more for at least 'the next few years'. By 1976, sales of *Memoirs* had fallen to zero and the stock was written out of the accounts of 1978. This expensive experiment to produce and sell high-quality specialist monographs by distinguished authors had been overtaken by the demand for more ephemeral publications (e.g. the conference-based monograph) that reflected the latest developments in an increasingly fast-moving science.

THE 1983 CRISIS

The Editor in Chief, James Sutcliffe, had been ill for some years, possibly an outcome of pneumonia contracted during military service. Editorial office work for the fast-expanding *Annals of Botany* may also have placed a strain on Sutcliffe's health. A letter from Audus to Sutcliffe (8 May 1981) discusses how an eventual successor might be found. The Company had reduced the burden on Sutcliffe by appointing Bryant and Abbott as Assistant Editors, but shortly afterwards, Sutcliffe died (7 June 1983; [Anonymus, 1984](#)) from emphysema. He was 61 years old. This sad and untimely loss placed the Journal in turmoil. The editorial office was located at Sutcliffe's home at Woodmancote in Sussex. Sutcliffe, with part-time clerical help from his wife, Janet, and others, was solely responsible for evaluating all manuscripts as they arrived, choosing which ones to farm out to Abbott and Bryant, editing the remainder himself, dealing with the editorial work from papers handled by Krikorian in the USA and corresponding with the Clarendon Press. Dodge recalls a unique house, probably converted from old farm buildings, with a large ground floor study with piles of manuscripts 'everywhere'. A neighbour (Mrs Kilner), did secretarial work and regularly transported numerous large envelopes and packets to the local post office. Placing so much responsibility on the shoulders of the one man operating in highly informal circumstances with only part-time help was a potentially unstable arrangement, but, at least by 1981, Abbott and Bryant had been in place to help. After Sutcliffe's death, Abbott and Bryant ([Fig. 15](#)) were made joint Editors and, with the support of Mrs Sutcliffe, sorted out the backlog of manuscripts at Woodmancote. A notice in *Annals of Botany* explained that submissions (about five a week) should continue to be sent to Woodmancote, but ongoing correspondence would be handled at Long Ashton. Although this stop-gap arrangement worked well and paper throughput speeded up, a more streamlined and professional administration was clearly required.

On 4 August 1983 a Special Meeting of the Company attended by Heslop-Harrison, Thorne, Dale, Dodge, Abbott and Bryant was held at Long Ashton to sort things out for the longer term. An offer from Dodge to run the editorial office from his department at Royal Holloway College, University of London, from January 1984 was accepted. An experienced part-time secretary would be employed at Royal Holloway to receive submissions and co-ordinate the editing procedures, handle routine payments etc. There was less agreement on the actual editing arrangements. The Company and Academic Press wanted Abbot and Bryant to continue as joint Editors in Chief and offered them substantial inducements. However, Abbott and Bryant declined these and proposed the creation of a sizeable Editorial Board to support one lead editor and to evaluate the ever-growing number of

submissions (261 in the year ending July 1982). The Company finally agreed to this. Editorial Board members would not be *Annals of Botany* Company members, would receive £20 (≡ £60) for each manuscript dealt with (£10 for a Short Communication) and be expected to serve for about 3 years in the first instance. Bryant and Abbott agreed to serve as Board members and the Company turned to David Frederick Cutler ([Fig. 16](#)), a morphologist and taxonomist from the Royal Botanic Gardens, Kew, to take overall charge. For a time, Cutler's post was, confusingly, termed 'Editorial Board Chairman' and 'Executive Editor'. Cutler would have been well known to the Company's Chairman, Heslop-Harrison, from his time there as Director and took up the reins in July 1984. He was, in effect, the Journal's Chief Editor, a term that was only introduced some 5 years later. With no formal administrative help, Cutler handled all submissions, made final decisions on every paper and was responsible to the Company for the Journal's performance and content.

Clearly, the loss of James Sutcliffe had thrown the Journal's management into temporary disarray, but ultimately it led to worthwhile reforms that still underpin the Journal's present editorial structure. For the first time, the Journal had an identifiable Editorial Board separate from but answerable to the *Annals of Botany* Company, with the Executive Editor-cum-Chairman (i.e. the *de facto* Chief Editor) being a member of the Company. A much earlier resolution to establish a separate Editorial Board had been made in 1947 but never fully implemented, and was abandoned in 1962. In addition to Abbott and Bryant, Cutler's Editorial Board comprised the algal physiologist James A. Callow (University of Birmingham), the pteridophyte specialist A. F. Dyer (University of Edinburgh), the cytologist Peter B. Gahan (University of London) and physiologists John R. Hillman (University of Nottingham), Jeff Moorby (Agricultural Research Council's Glasshouse Crops Research Institute, Littlehampton) and Keith G. Moore (University of Bath), with Dodge as the Board's Secretary. In this way, much additional editorial manpower and expertise were brought to the Journal. To minimize strain on the small editorial office at Royal Holloway, each editor would be individually responsible for corresponding with authors and referees, sending them manuscripts and receiving comments and annotated paperwork etc.

THE CUTLER AND HUNT EDITORSHIPS (1984–1996)

The Cutler editorship (1984–1990)

In 1984, *Annals of Botany* was in good shape after years of strong growth in size, subscriptions and popularity achieved during Sutcliffe's 12 years as Editor. By the early 1980s, the Journal's rejection rate was 35–45 % and submissions were highly international, with sizeable numbers originating from outside the UK, especially from North America. Finances were also healthy, thanks to shrewd investments and timely increases in the subscription price ([Figs 4 and 12](#)). However, Cutler had also inherited some problems. The Journal's visuals (front cover, page size and internal layout) had changed little since 1971. By contrast, *Planta* and *Plant Physiology* had long since adopted wide-page double-column formats

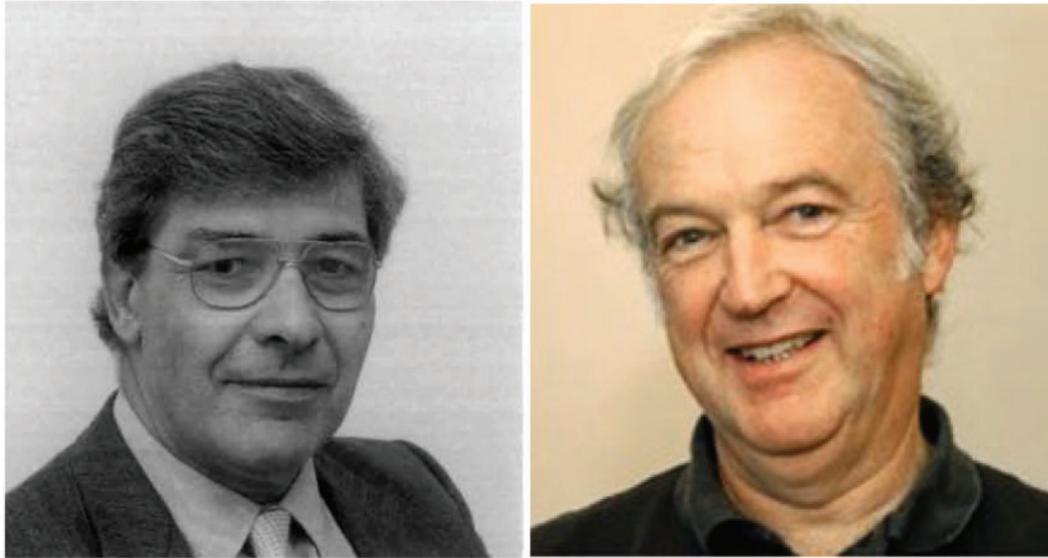


FIG. 15. Anthony John Abbott (left) and John A. Bryant (right). Abbott and Bryant were appointed Associate Editors in 1982 and became joint Editors in Chief for a year from mid-1983 following the death of the Editor in Chief, James F. Sutcliffe. Abbott and Bryant continued under Cutler as members of a newly constituted Editorial Board from 1984 to 1987 and from 1984 to 1993 respectively.

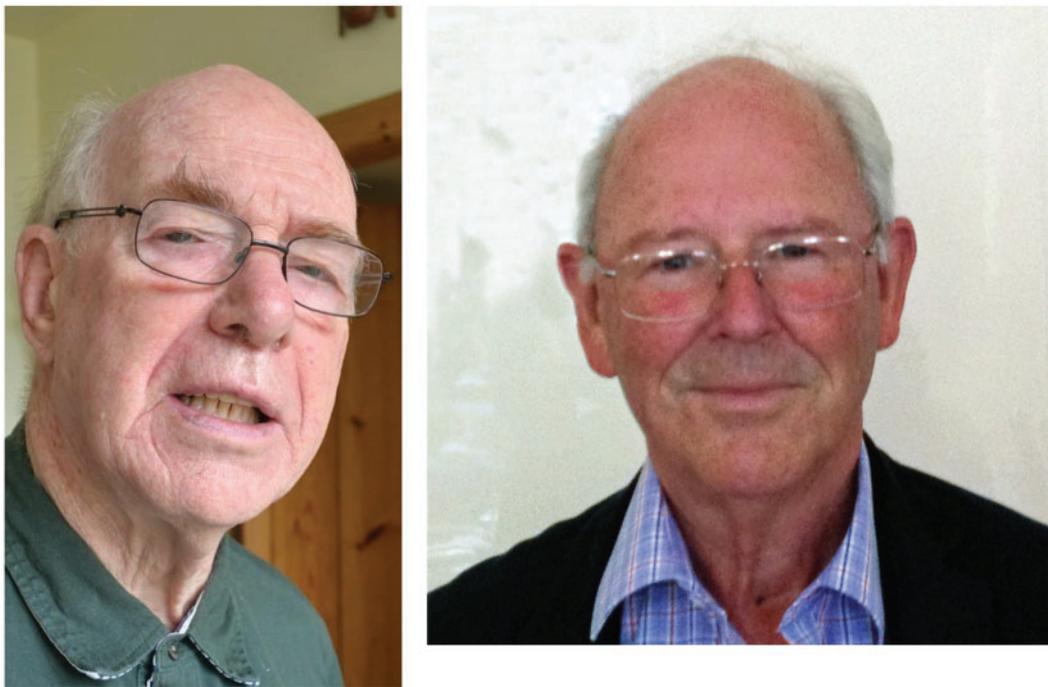


FIG. 16. John Edgerton Dale (left) and David Frederick Cutler (right). Dale was Chairman of the Annals of Botany Company from 1985 to 1995. Cutler was Chief Editor of *Annals of Botany* from 1984 to 1990 and a member and Vice-chairman of the Annals of Botany Company to beyond 2012.

with arresting covers and printed throughout on coated art paper. The Journal was also slow to process its papers. In January 1984, *Annals of Botany* was taking almost 7 months for accepted papers to appear (cf. 4 months at *New Phytologist*). This suggested that time from submission to publication in *Annals of Botany* was over a year (actual data are not available) and thus no better than in 1978. Other leading competitors were considerably faster. In January 1984,

Planta was taking 6.3 months from start to finish, *Journal of Experimental Botany* (still with the Clarendon Press) 6.8 months and *Plant Physiology* 7.4 months.

Minutes of the Company AGMs and, from 1984, those of the newly created Editorial Board document how these challenges were dealt with. By the end of the Cutler time, the growing amount of day-to-day work was embraced by replacing part-time secretarial assistance in Dodge's editorial office by a full-

time biology graduate (Phillipa M. Allington) who would also do copy-editing. Allington was replaced in 1990 by Simon Hawkins, who held a plant science PhD. Interaction between Company and Editorial Board members was encouraged by instigating a shared annual lunch, and holding Company and Editorial Board annual meetings on the same day and at the same easily accessible venue in London. The Royal Over-Seas League, a club off St James's Street, London, was chosen. This venue, heavily redolent of Empire, was a throwback to grander times.

Some minor improvements were quickly made to the Journal itself. In January 1985, a new shade of green was adopted for the front cover and content information on the front replaced with a list of editors (Fig. 17). A proposal to place a botanical photograph on the front instead did not find favour. Two years later, and despite Academic Press opposition, a slightly wider page with two columns was instigated, along with the adoption of art paper throughout and a further change to the cover. This latest cover was not a radical departure but served to highlight the 100th anniversary year of the Journal (1987). A glossy finish was applied a year later but the result failed to match the more imaginative broad-format covers of rivals. The Journal continued to invite submissions on 'any aspect of botany or plant science'. Then, as now, there was been no move to specialize in particular areas of plant biology.

An influential letter from the Company's Honorary Member (Heslop-Harrison) in 1990 and pressure also from Canny (Editor for North America) finally persuaded the Company it should to move its journal to a broader format (approximately A4 size) with larger text, colour plates and denser paper, and seek a new cover design. Colour plates in the text would be the first since the 1890s and the Company would help authors pay the eye-watering cost of £800 (≡ £1540) per plate. A previous deterrent to the more frequent use of colour had been out-of-date colour technology at the printers (Cambridge University Press). But the quality of their monochrome work also needed upgrading. It would fall to Hunt, Cutler's successor as Chief Editor, to bring in the necessary changes with help from a small working party (initially Hunt, Cutler and Jackson).

The number of submissions had remained roughly the same throughout Cutler's 6 years (just under 300 per year), as did the size of the Journal (183 papers in 1984, 172 papers in 1990) (Fig. 7). The Journal was also still slow in handling its papers. By 1990, Academic Press was taking almost 6 months from acceptance and total publication times had improved little (10 months in 1986, 11 months in June 1990). Although grumbles about slowness persisted, it was decided (1987) that speed could not be bettered if good refereeing was to be preserved. Furthermore, Academic Press was still allowed to hold back manuscripts to ensure even-sized monthly issues. However, sensitivity to the poor timeliness may explain the decision by the Editorial Board (1985) not to print both received and acceptance dates on published manuscripts but to continue showing only the acceptance date. Paying referees to encourage faster evaluation was considered but rejected. Scientific selectivity in the form of the rejection rate also remained much as before (about 38 %), while institutional subscriptions to the Journal were falling by about 5 % a year. Short Communications too were a short-lived success and by 1990 were no longer being encouraged, while starting invited reviews

or mini-reviews was thought to be too problematic. Clearly, it was proving difficult to improve on the Sutcliffe years and several problems were mounting.

During Cutler's 6 years, the Company prospered financially (Fig. 4) with accumulated wealth rising impressively from £122 480 (≡ £346 610) to £415 030 (≡ £863 264), thanks in part to steady increases in subscription rates (Fig. 12), while journal size remained stable (Fig. 7). This meant the Journal was charging more per paper published (Fig. 10), even though some extra articles were added free of charge in the form of Supplement 3 (on experiments in space flight) and Supplement 4 (see next paragraph). An additional contributing factor was a new contract with Academic Press (1988) negotiated by Dodge, which doubled the Company's take of the publisher's operating profit from 25 % to 50 %. The accounts also benefitted, for the first time, from external professional investment advice. The increased prosperity stimulated the creation of a more overt policy on charitable giving. Approximately £20 500 (≡ £46 540) per annum was set aside to support projects such as the Royal Society's travel fund for young scientists, the book *Potatoes in Bolivia* by J. G. Hawkes, and grants for research workshops and schoolteacher sabbaticals. Company members and editors were also being helped with costs of a computer to help their editing work and were paid to attend conferences such as the XVth Botanical Congress at Berlin (1987). The editorial office at Royal Holloway College bought its first computer in 1986 for a not inconsiderable £2500 (≡ £6202), along with its first fax machine. From this time onwards, reports and minutes lengthened inexorably.

The period was unsettled in terms of Company membership (Item 1), in part reflecting the Company's wish to refresh it more frequently than hitherto and (seemingly) to add more applied scientists to its ranks. It appointed Jack Edelman, Head of the Lord Rank Research Centre (the first Company member from industry) and the agronomist and plant breeder John P. Cooper FRS (Director of the Welsh Plant Breeding Station, Wales). Other changes included resignations by Harper in 1984 and the Chairman, Heslop-Harrison. The latter was replaced as Chairman by Dale (Fig. 16), and a year later Heslop-Harrison was made Honorary Company Member in recognition of his outstanding service (6 years as Editor or joint Editor and 12 years as Chairman). Hirst (the first applied scientist to become a company member) resigned in 1987, having served for 10 years. New entrants were the evolutionary biologist Anthony David (Tony) Bradshaw FRS, Professor of Botany at the University of Liverpool, and the cytologist Michael David Bennett. Bennett was Keeper of the Jodrell Laboratory, Royal Botanic Gardens, Kew, a post once held by Dukinfield Henry Scott, one of the Journal's founders. The biochemist John A. Bryant, a previous Joint Editor and Editorial Board member also joined the Company, as did the biochemist Sir Ernest Arthur Bell (former Director of the Royal Botanic Gardens, Kew) and Michael W. Bayliss (scientist at Imperial Chemical Industries plc Bioscience Group). After 25 years with the Journal, Audus stepped down in 1990.

The Editorial Board was also in some flux. To some extent this was explained by the new policy of appointing editors for 3 years in the first instance. The mathematical modeller Roderick Hunt (University of Sheffield) joined in 1985 but left

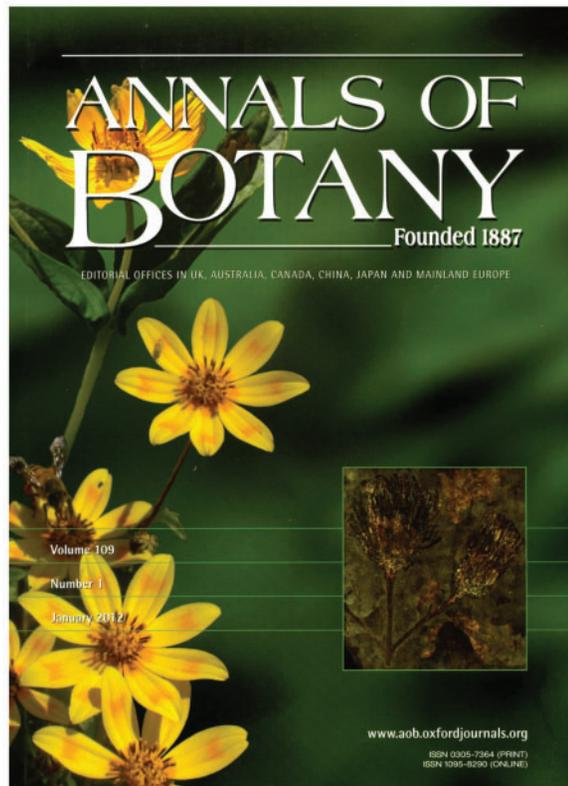
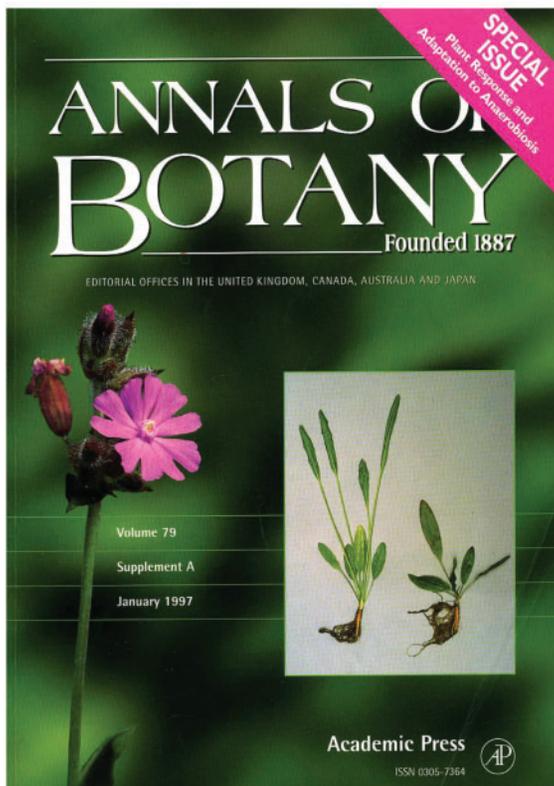
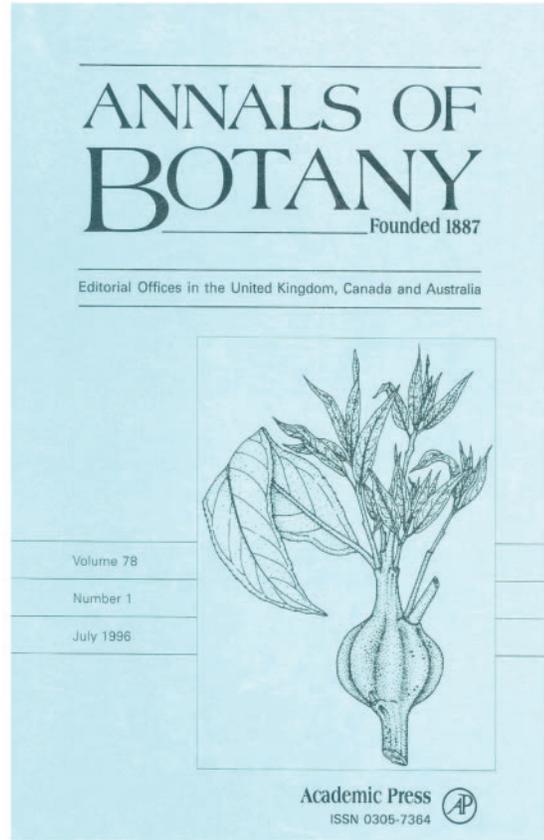
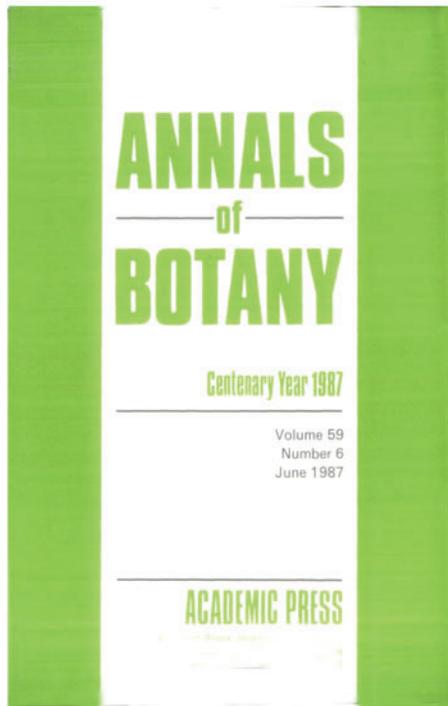


FIG. 17. Covers of *Annals of Botany* in use from 1987 to 2012. (Top left) Cover introduced in 1987 to mark the centennial year of the Journal (size approximately 7 inches \times 10 inches (17.8 cm \times 25.4 cm)). (Top right) Cover introduced in January 1991 in broad format (approximately 21 cm \times 27.8 cm) with monochrome artwork and text on a green metallic cover. (Bottom left) Cover introduced in 1997 as the Journal's first full-colour cover. (Bottom right) Cover used in 2012.

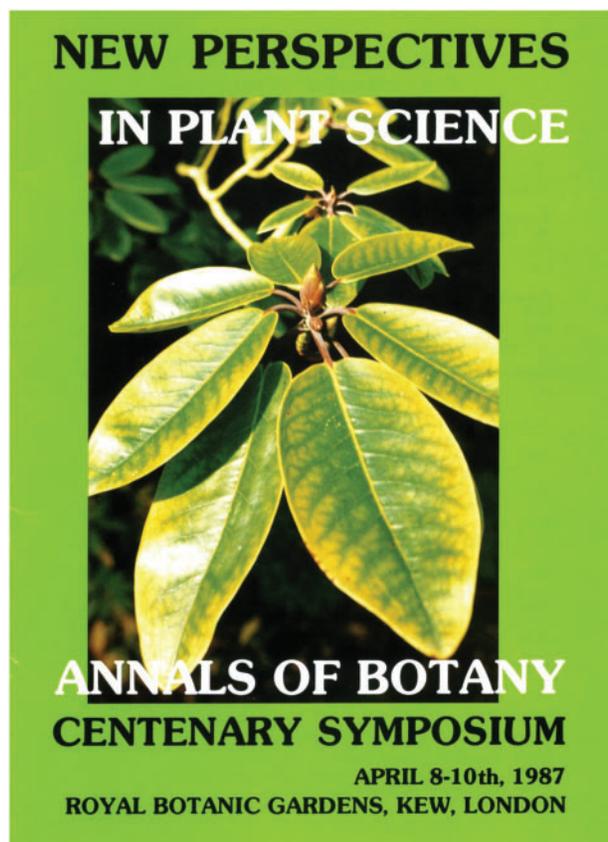


Fig. 18. Flier promoting a symposium to celebrate the centenary of *Annals of Botany*.

5 years later to become Chief Editor and Company Member. The Board also lost Hillman, Abbott, Dyer and Bryant in quick succession. They were replaced by the biochemist L. R. Guy Valadon (University of London), the taxonomist Peter E. Gibbs (University of St Andrews), the physiologist Michael B. Jackson (University of Bristol) and the molecular cytogeneticist John S. (Pat) Heslop-Harrison (AFRC Institute of Plant Science Research, Cambridge and son of the recently retired Chairman). The cryptogamic botanist Elizabeth Sheffield (University of Manchester) also became an editor. Overseas representation was strengthened by appointing Martin J. Canny, a water relationships expert from Carleton University, Ottawa, Canada. Canny replaced Krikorian as the Editor for North America, 8 years after the latter's resignation. During the interregnum, submissions from the USA had grown to 18.3 % of the total. *Annals of Botany* was, at last, fulfilling the ambition of the Journal's founders to attract a sizeable number of authors from America. The following year (1990), William G. Allaway, University of Sydney, Australia, accepted a similar position covering Australasia, Japan and the Pacific, a region where botanical science was particularly strong.

An undoubted highlight of the Cutler years was an international symposium held at the Royal Botanic Gardens at Kew in 1987 to mark the centenary of the Journal (Fig. 18). It was organized by Cutler, Dodge and Gahan. The speakers were funded by the Company (budget £12 000, ≡ £28 580). The most tangible outcome was the prompt publication of 13 invited

papers as Supplement 4 under the title 'New perspectives in plant science'. This eclectic collection reflected, in part, the growing interest in molecular genomics, although in the final paper H. W. Woolhouse (recently appointed as Director of the John Innes Institute, Norwich, UK) gently pointed out that *Annals of Botany* had yet to publish a single paper on transgenic plants and recombinant DNA technology. As with growth substance research in the 1930s and 1940s, the Journal had failed to attract pioneering authors in a burgeoning new field of botanical research.

A taste of future publishing policy was given when the January 1989 issue was made over to a set of 20 papers based on a seed biology conference at Kew and edited by Moore. The Journal would do more of this in the coming years. Another glimpse into the future was the suggestion, made at the 1990 AGM, that the Company consider starting an electronic journal. This eventually came to pass but not for another 18 years, when the open access journal *AoB PLANTS* was launched.

The Hunt editorship (1990–1996)

During Hunt's time, the Journal's day-to-day management remained with Secretary Dodge at Royal Holloway College in London with help from a full-time Assistant Editor [Dr Simon Hawkins (1990–1992) or Shân English (1992–1996)]. With no office to relocate, Hunt (Fig. 19) was able to make prompt and substantial changes to the Journal. These included responding to complaints about the Journal's out-of-date appearance. By January 1991, the new Chief Editor had increased page size by 32 % and added a striking metallic finish to a new front cover that carried a main image that would change each month to catch the attention of library browsers (Fig. 17). The external remodelling was complemented internally by a new and concise set of Instructions to Authors included in every issue and a rationalized format for bibliographic references based on the Vancouver system. This format, later adopted by journals such as the *Journal of Experimental Botany* and the *New Phytologist*, was developed in conjunction with the recently formed European Association of Science Editors (Hunt, 1992). The format is still in use. Hunt also put forward novel steps to speed up the Journal. These included incentivizing referees by paying them a fee for particularly fast work and awarding editors bonuses for good performance [editors were already paid £30 (≡ £55) for each manuscript they handled]. However, these proved unacceptably radical (and expensive) and failed to find favour with the Company or the Editorial Board. However, Hunt's proposal to appoint an editor to handle papers from Japan and South East Asia was welcomed.

Changes to management

In 1991, Moorby left the Editorial Board and joined the Company to replace Chaloner. Also joining the Company were Professor Steve G. Hughes (Director of Unilever's International Agribusiness Applications Unit at Cambridge) and Professor Roderick J. Summerfield, a physiologist from the University of Reading. Bell resigned in 1995 and Bradshaw did so the following year. Since 1887, the management and editorship of *Annals of Botany* had been dominated by grandees with knighthoods



FIG. 19. Jeff Moorby (left) and Roderick Hunt (right). Moorby was Chairman of the Annals of Botany Company from 1996 to 2004. Hunt was Chief Editor of *Annals of Botany* from 1990 to 1996 and Secretary and Treasurer of the Company from 1996 to beyond 2012.

and/or fellowships of the Royal Society. The departures of Bell (Sir Arthur from 1987) and Bradshaw (FRS from 1982) saw an end to the once habitual connection with this honoured elite. When Dale resigned in 1995 he was replaced as Chairman by Moorby (Fig. 19). Gahan, Callow, Gibbs, Hall and Moore left the Editorial Board during the period and were succeeded by Frederick Meins from Basel, Switzerland (the first overseas member of the Editorial Board), David S. Ingram, Regis Keeper (Director) of the Royal Botanic Garden, Edinburgh (a post previously held by the Journal's co-founder Sir Isaac Bayley Balfour), Elizabeth Sheffield, Michael A. Venis, Hugh W. Pritchard, David R. Causton and Robert K. M. Hay (Item 1). Thus, despite many departures, the size of the editorial team was kept to 11 core members plus the Chief Editor and the Editor for North America (Canny). The first Editor for Australasia (William J. Alloway) was added in 1990 and the first Editor for Japan (Professor Tadeki Hirose from Tōhoku University) joined in 1996. In the same year, Ian W. Wardlaw replaced Alloway as Editor for Australasia. Competing duties had forced Alloway to default on his work for the Journal, although not before organizing a sizeable conference and special issue on the Epacridaceae. This was published as the April 1996 issue of *Annals of Botany*. However, the Alloway impasse resulted in a backlog of about a year's worth of regular submissions from Australasia. Many southern hemisphere authors were very disgruntled by the inevitable long delays in publishing their papers.

Changes to performance and operations

The Institute of Scientific Information (ISI), based in Philadelphia, USA, had been calculating impact factors for

science journals since the early 1960s (Garfield, 2005). An impact factor for a journal such as *Annals of Botany* is the average number of citations made by a wide range of journals in a given year (e.g. 1995) to papers published in *Annals of Botany* in a previous 2-year window (e.g. 1993 and 1994). The impact factor for a given year also reflects the Journal's attempt to attract and evaluate papers over two or more years prior to the 2-year window. A lead time of 4–5 years therefore lies behind the year date of each impact factor. *Annals of Botany* impact factors (Fig. 20) averaged just over 1 and this changed little from 1988 to 1996 despite undoubted improvements to the Journal itself. This rating placed *Annals of Botany* about 38th in ISI's list of plant science journals and thus well below many equivalent competitors.

Other performance statistics also remained remarkably unchanged. The number of papers published declined slightly over the period (162 in 1991, 151 in 1995) (Fig. 7), as did the time taken to publish accepted papers [almost 7 months for Volume 65 (1990) down to 5.4 months for Volume 77 (1996)]. However, the time from first receipt to final publication was approaching 10 months, much the same as in 1986, although selectivity had increased in the face of a 16% rise in submissions (to 336 per year). The Company was increasingly aware of the need to improve the Journal's performance if it was to increase its competitiveness. To this end, an Extraordinary General Meeting was held in November 1993 to develop a way forward. This meeting accepted most of the recommendations to streamline the Journal's image and editorial procedures made by a working group comprising Causton, Sheffield, English and Jackson (Chairman). By July 1994, the Journal had started to publish received as well as accepted dates for each paper to highlight hoped-for future improvement to the Journal's timeliness. Speed would also be assisted by a decision to relax the

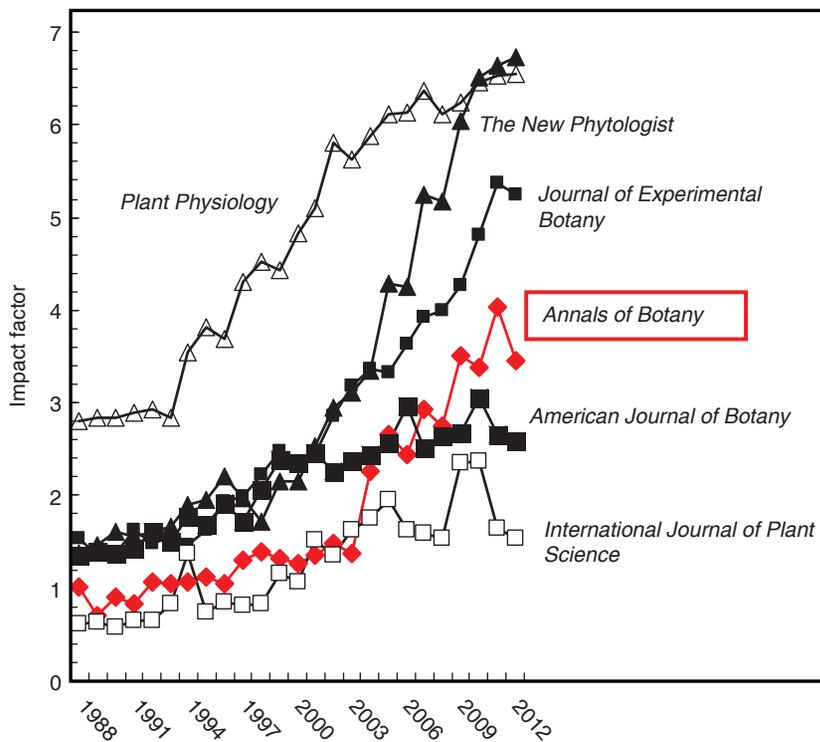


Fig. 20. Changes in the ISI impact factor for *Annals of Botany* from 1988 to 2012 in comparison with competitor journals. (From 2008, the ISI impact factor became known as the Thomson Reuters impact factor.)

annual page budget to allow the Journal to grow while not slowing publication because of backlogs of accepted manuscripts. The 1993 Extraordinary General Meeting also discussed the outcome of a readership survey conducted by Academic Press. The survey, arranged by Andrew Richford, was a substantial attempt by the Press to help the Journal. However, it did little more than confirm that although *Annals of Botany* was perceived as having no particular subject strengths and was not a first-choice journal for many, it remained well thought of by survey respondents. A more tangible contribution by Academic Press was the introduction, in 1995, of electronic submissions of accepted papers using floppy discs (paper copies were still needed for refereeing). This should have helped shorten publication delays, although the extent to which the printer (Cambridge University Press) actually used the discs for typesetting was in doubt for some years.

Between 1990 and 1996, the Journal's scientific content remained broad, with the long-standing dominance of physiology and development being partnered by a growth in mathematical modelling. A wide global spread of submissions was also being maintained and the proportion of papers published from the UK declined from 27% in 1990 to 17% in 1996. Ambitions to add more colour to the Journal for both scientific and promotional reasons were frustrated by an inability of Cambridge University Press to apply colour to the metallic finish on the cover and by high costs for inside colour plates. One page of colour was thought to add £700 (≡ £1139) to production costs. Nevertheless, colour usage did expand over the period, with Academic Press agreeing to pay half the cost for scientifically justified colour, the Company paying the remaining half.

Colour was especially encouraged from authors of Botanical Briefings. These mini-reviews were initiated by Jackson in 1995 with the intention of increasing citations and readership. Botanical Briefings authors were rewarded with a payment of £200 (≡ £325.50).

Financial matters

Despite paying Academic Press for more extra pages above the annual agreed page budget, making generous charitable donations (£14 000 was donated in 1993/94), paying £80 (≡ £130) to editors for each paper handled and paying for editors and Company members to attend the 1993 International Botanical Congress in Japan, the Company's reserves grew by 68% [from £415 031 (≡ £863 264) in 1990 to £698 975 (≡ £1 160 299) in 1995] (Fig. 4). Income benefitted from growing investment receipts and a doubling of the Journal's share of the trading profit from 25% to 50% negotiated by Dodge. The reserves also benefitted from Academic Press's relentless policy of continuously raising the subscription price. This rose by almost 100% over Hunt's time as Chief Editor [from £148 (≡ £285) in 1990 to £295 (≡ £468)], even though the size of the Journal decreased slightly (Fig. 7). This more than compensated for the approximately 3% fall in the number of subscriptions each year (1283 subscribers in 1990 down to 1120 by 1995) (Fig. 5) and for rising production costs.

These steep increases in subscription price (a further rise of 19% was planned for 1997), declining numbers of papers published and an annual ~3% fall in the number of subscriptions were unsustainable trends. For one thing, value for money for

subscribers was in decline. Each paper published in the Journal in 1995 now cost subscribers £2.75 (adjusted to 2012 prices), a level not seen since the lean years of World War II (Fig. 10). Such trends were common to most scientific journals. Academic Press and its competitors were looking for ways to reduce costs to individual libraries as a way of stemming the attrition in sales whilst widening access. The way forward involved consortial deals and licensing agreements that gave students and academics entry to a bundle of the publisher's journals for a single institutional fee. A pilot Academic Press scheme, called APPEAL, was the harbinger of such developments, which would transform the way journals would be paid for and accessed. By the end of 1996, the first consortial licence was granted by Academic Press to the UK Higher Education Funding Council. Soon, the basic number of subscriptions would no longer be reliable indicators of the Journal's sales as more and more somewhat opaque consortial deals came in (Fig. 5).

Overall, the Cutler and Hunt years were characterized by an increasingly active management with numerous measures being introduced to improve the look and scientific content of the Journal, update its editorial practices and increase editorial inputs from overseas. The intention was to quicken publication, raise competitiveness and appeal for authors, readers and their institutional libraries while maintaining scientific rigour and selectivity. Raising the ISI impact factor was, at last, being recognized by the Company as a target for improvement. For its part, the publisher, Academic Press, was embracing the digital age by taking accepted papers on floppy disc, starting to publish *Annals of Botany* online and seeking new ways to sell its journals. Nevertheless, despite these developments, the performance of *Annals of Botany* in terms of speed, size, popularity and impact factor remained largely unchanged between 1984 and 1996.

THE 12-YEAR JACKSON EDITORSHIP (1996–2008)

In response to the flat performance of the previous 12 years, Jackson (Fig. 21), with Company support, quickly brought in numerous changes based on a detailed examination of the Journal's practices and performance. Further changes followed later, driven by outside circumstances, large increases in submissions, the arrival of online manuscript handling systems and mounting pressures to improve the ISI impact factor. The outcome was that by 2008 *Annals of Botany* had regained much lost ground and emerged once more as a progressive, competitive and well-cited international journal.

1996–2002

In 1996, the resignation of Dodge as manager of the editorial office and of his Assistant Editor, Siân English, created the opportunity to transfer the editorial office to the new Chief Editor at the University of Bristol's Long Ashton Research Station. This is where, in the summer of 1996, Dodge delivered a multitude of paper files and office paraphernalia from Egham in a hired van, a mere suitcase no longer being adequate (see the section above, The Years

1961–1970). This new beginning was strengthened by numerous appointments. These included a highly qualified Assistant Editor (Judy Naylor), who held a doctorate in plant science and also copy-editing credentials. Furthermore, Academic Press replaced the long-serving Andy Richford with the highly supportive Susan Lord as the Journal's Manager. New regional editors were already in place for Australasia (Wardlaw) and Japan (Hirose) and eight mostly UK-based Editorial Board members were soon added to widen coverage, making 14 editors in total. After 9 years' service as Editor for North America, Canny resigned and was replaced in 1998 by William W. Thompson (University of California). There were no further editorial resignations during the first 4 years. Heslop-Harrison joined the Company in 1997 while retaining his Editorial Board membership, and in 1999 Summerfield left the Company to be replaced by the cell biologist Hugh Gordon Dickinson, Sibthorpe Professor of Botany at the University of Oxford. Dodge left the Company in 2002 after a remarkably active and constructive 25 years of service.

In 1996, the first priority was to replace the metallicized monochrome cover with one able to take full colour. The new design comprised a diffuse green *Monstera deliciosa* leaf, an inset colour plate that would change with each issue, a large plant portrait that would change each year and a list of contents on the back set against a white background to allow clear photocopying. The arrangement was still in use at the time of writing (2016). This look (Fig. 17) first appeared in January 1997 and was backed up by a full-colour multi-page promotional leaflet. Academic Press's agreement to halve the 6 months they previously needed to publish accepted papers contributed to shortening delays. To cope with hoped-for increases in the number of papers published, the Company agreed to pay Academic Press for any pages in excess of the annual budgeted size. Long delays in delivering the Journal (e.g. 3 months to Australia or Singapore and 2 months to Finland and 1 month in the UK) were quickly remedied and editing procedures fine-tuned to run faster (e.g. faxing or e-mailing rather than posting authors' proofs). The need for visible evidence of the Journal's anticipated shortened publication times and to identify where any delays lay led to printing three handling dates on each paper, viz. received, returned for revision and accepted. Improvements made to the Journal's fledgling web site included listing all papers as soon as they were accepted (later called *AoBFirstAlert*) and introducing e-mailed tables of contents (eTOCs).

The Journal's appeal, especially to authors, was increased by printing colour images without charge and sending every senior author a complementary copy of the issue in which his/her paper appeared along with the, by then, customary 100 free reprints. Instructions to Authors were revised and editorial transparency increased by printing full contact details for all Editorial Board members in the Journal and listing referees in an International Review Board that was refreshed every 6 months. Scientific content was boosted by Company's funding of *Annals of Botany* Lectures at international meetings in return for review articles and by commissioning Invited Reviews, for which authors were paid £500 (≡ £770.5). The Company also funded Special Issues on topical subjects (e.g. 'Plant response and adaptation to anaerobiosis'). Highlight collections were also introduced. These were shorter sets of papers



Fig. 21. Michael David Bennett (left) and Michael Barson Jackson (right). Bennett was Chairman of the Annals of Botany Company from 2003 to 2008. Jackson was Chief Editor of *Annals of Botany* from 1996 to 2008 and Chief Editor of *AoB PLANTS* from 2009 to 2012.

on topical subjects that could be incorporated into regular monthly issues. To improve decision-making, whole rather than half days were devoted to each annual Editorial Board meeting and the Company AGM. An e-mail bulletin board to expedite communication between editors, Company members and the editorial office was introduced. Naylor also set up the Journal's first centralized e-mail-based manuscript handling system. Until then, editors, not the editorial office, posted manuscripts to their chosen referees and corresponded with them and with authors about decisions using letter post. This work was now centralized. Naylor was also responsible for basic copy-editing in addition to the day-to-day operations and, additionally, gave secretarial support to the Company Secretary (Hunt) and helped the Chief Editor organize the Federation of European Societies of Plant Physiology (Jackson had followed Dale as its Secretary General). The FESPP connection gave a useful platform for promoting *Annals of Botany* on the European mainland. In 1999, Long Ashton Research Station presented Naylor with a well-deserved Exceptional Performance Award. However, she was clearly overworked and the Company agreed to upgrade her to Assistant Editor and appoint a half-time editorial assistant (Diane Swan), who, amongst other things, took responsibility for a much expanded book review section (65 books were sent out for review in 1998).

Tangible performance benefits accrued from the changes. Over the 6 years, submissions grew from 258 in 1995 to 472 in 2002 (an increase of 83 %) while selectivity rose from 45 % to 63.8 % and the number of papers published annually grew from 151 to 186, although figures were erratic (e.g. 257 in 2000). The time to publish papers fell from over 10 months to about 8 months but proved resistant to much further improvement. The ISI impact factor crept up from 1.05 in 1996 to 1.48 by 2002 but still lay below that of competitor titles such as *The New Phytologist*, *American Journal of Botany* and *Journal of Experimental Botany* (Fig. 20). In 2002, *Annals of Botany* was ranked 36th in ISI's plant science list, almost the same position

as 6 years before. Over the period, subscriptions fell from 1130 to 755 but loss of income and readership were compensated for by licence agreements, which, by 2002, comprised 150 library consortia covering 5000 libraries worldwide and 30 other consortia with between 50 and 500 sites each.

Major upheavals

In 1999, closure of the University of Bristol's Long Ashton Research Station was announced, forcing the Chief Editor and editorial office to find a new home. Within the year, Diana Swan, the half-time editorial assistant resigned and was replaced by Victoria Brown. Brown proved to be unsuitable and resigned soon afterwards, leaving only Naylor to operate the Journal day to day, deal with a mounting number of submissions and relocate the office. The editorial office's new location was the University's School of Biological Sciences several miles away. The move was complicated by the editorial office being required to return to Long Ashton for 9 months in 2002/03 because of asbestos problems at the new location. Once permanently resettled, Elaine Atkinson, who had previous editorial experience at *Phytochemistry*, was appointed. She was the third successive editorial assistant in 2 years. At this time, membership of the Editorial Board became unsettled. Notable amongst the resignations was that of Wardlaw, the Editor for Australasia. He was replaced by Timothy D. Colmer, a stress physiologist from the University of Western Australia, in 2001. With parallels to the 1971–1983 Sutcliffe editorship, running an editorial office in changing times with steeply rising submissions and limited personnel made for challenging times.

2002–2008

In late 1997, Blackwell, the Oxford-based publisher, had offered to publish *Annals of Botany*. A visit to their

headquarters revealed a forward-looking and digitally progressive organization. The Company was very tempted by this offer but was put off by Blackwell recently taking on the publication of the *The New Phytologist*, a closely similar journal. Nevertheless, the experience encouraged the Company to seek tenders from a range of publishers, including Academic Press (soon to be subsumed by Elsevier Science). The 18-month-long process was spearheaded by Hunt and the outcome, after careful scrutiny of seven tenders, was migration to Oxford University Press (OUP). This was highly appropriate since OUP, in the guise of the now defunct Clarendon Press, had published the Journal for its first 100 years and both sides shared a similar not-for-profit ethos. The first issue under the OUP imprint appeared in January 2002 and included an Editorial from the Chief Editor and OUP Senior Editor Cathy Kennedy that set out aspirations for the new collaboration (Jackson and Kennedy, 2002).

Over the period, a stabilizing influence was the Company's largely unaltered membership. The only changes were Moorby's resignation from the chairmanship in 2004 and his replacement by Bennett (Fig. 21). Moorby finally left the Company in 2007 after serving the Company for an impressive 23 years. Heslop-Harrison was made Vice-chairman in 2004 and the biochemist Professor Christine Helen Foyer joined the Company. In contrast, the make-up of the Editorial Board changed greatly. Hirose stepped down as Regional Editor for Japan in 2002 while remaining an editor, and was replaced by Hideyuki Takahashi, a hormone physiologist from Tohoku University, Sendai. The same year, Thomson retired as Editor for North America, with John William Shipley (University of Sherbrooke, Canada) taking over his responsibilities in 2003. At the time, there was a push to broaden editorial expertise, increase international coverage and expand the Editorial Board to help deal with the still-growing numbers of submissions. The new Board members included Margaret Sauter (molecular physiologist, Germany) who was appointed as the first Editor for Mainland Europe with responsibilities for promoting the Journal in that area. There were 20 further appointments. These included Thomas L. Rost (University of California, USA), the first Review Articles Editor, and Shao Jian Zheng (Zhejiang University, Hangzhou), the Journal's first Regional Editor for China. A complete list of all editors (and others) who served the Journal between 1937 and 2012 and their dates with the Journal is given in [Supplementary Data Item 1](#).

The year 2003 saw the resignation of Naylor after 7 years of exemplary service as Assistant Editor. She was replaced by David Frost, who also held a PhD in plant science and came with several years experience in publishing. By this time, submissions had climbed to 503 a year (70 % being rejected after evaluation). The growing numbers were overwhelming the existing cumbersome e-mail-based manuscript handling system. This was slowing publication times by at least 1–2 months. To ease the pressure on the Editorial Office, the Company agreed to outsource 75 % of the copy-editing and to adopt a commercial online manuscript tracking and handling system. The most recent version of ScholarOne's Manuscript Central system was tested exhaustively by Jackson and Frost but abandoned after 8 months because of fundamental shortcomings that neither OUP nor ScholarOne could rectify at the time. It took another 18 months for an alternative system (eJournalPress) to be

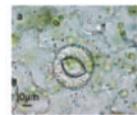
identified and commissioned. In the meantime, submissions increased by 15 % in 2004 to 579 (25 % of submissions coming from China) and by a further 17 % (to 676) in 2005. Once eJournalPress had commenced operations in January 2006, submissions rose even faster, reaching 962 by 2007, in association with an unprecedented 80.3 % rejection rate. Some of the cost of adopting eJournal Press was covered by halving editors' pro rata payments to £45 a manuscript (\equiv £55.13).

The visibility of papers in the Journal and appeal to readers was enhanced in 2002 by the introduction of *ContentSnapshots* to the Journal's front end, with illustrated summaries of each paper and active links to the actual papers for online readers. This was partnered by *ContentSelect* written by Bryant (a Company member), comprising punchy analyses of four notable papers from each issue (Fig. 22). The aim was to direct readers' attention to actual content. At the same time, book reviews became illustrated with colour thumbnail images of book covers. By 2003, readers could also download Botanical Briefings and Reviews without charge when first published and enjoy cost-free access to all papers after 12 months, the intention being to maximize the chances of articles being read and cited. OUP contributed to this by making papers available on-line as soon as proofs were checked (called *AoBPreview*) and extending free online access to all papers to about 70 of the world's poorest countries. A further major development from OUP was the digitizing of past issues of all its journals (including *Annals of Botany* going back to 1887) and making the resulting collection, called the Oxford Journals Digital Archive, available online for a one-off institutional charge that would be shared with the Company. Regional editors were also making a strong contribution by arranging numerous *Annals of Botany* Lectures, conference sessions and undertaking general promotion work. From January 2006, the Journal offered authors the possibility of publishing their work as open access papers (i.e. universal charge-free access as soon as published). However, the take-up each year was low, explained perhaps by the substantial fee (£1500, \equiv £1838).

In recognition of the size of the botanical profession in China and its potential as a source of papers and readership, a mathematical modelling conference in Beijing was supported financially by the Company and *Annals of Botany* Lectures were arranged at universities in Wuhan and Hangzhou. Discussions between the Chief Editor and editors of the Chinese journals *Journal of Plant Ecology* and *Journal of Integrative Plant Biology* (formerly *Acta Botanica Sinica*) resulted in Memoranda of Understanding between *Annals of Botany* and these Chinese journals. Hyperlinks were established on the respective home pages to give charge-free access to current papers in the other journals. The principal aim was to raise awareness of *Annals of Botany* in China.

The OUP contract gave the Journal 75 % of the operating profit, 25 % more than it enjoyed with its previous publisher, Academic Press. This, together with annual increases in the subscription price, raised income for the Company substantially. A downside for subscribers was a steep rise in the cost per published paper. This rose substantially after adjustment for inflation (Fig. 10) and stood at well over £3 by 2012 (it had been as low as £0.65 in 1976). Not surprisingly, the Company's

ContentSnapshots



Polar molecules can cross cuticles (Botanical Briefing)

Although plant cuticles are lipophilic polymer membranes, there is increasing evidence that polar compounds can diffuse across them. Schreiber (pp. 1069–1073) show that ions and charged organic molecules use polar paths of transport. Transfer takes place preferentially in the vicinity of stomata and trichomes. These results demonstrate pronounced inherent lateral heterogeneity in plant cuticles.



Efficacy of phytochemicals for cancer reduction (Invited Review)

Identifying health-promoting compounds in plants and developing foods enriched with such compounds are important research goals. However, stringent criteria are needed to evaluate health benefits. Finley (pp. 1075–1096) proposes such criteria and uses them to evaluate the efficacy of carotenoids, lycopenes, glucosinolates, polyphenols and selenocompounds for the reduction of cancer.

Chiropterophily in *Sinningia* (Gesneriaceae) species

The extent of bat pollination in the Gesneriaceae is uncertain.

SanMartin-Gajardo and Szirma (pp. 1097–1103) present data that strengthen an independent origin for bat pollination in *Sinningia brasiliensis* and *Palisavana prasinata*. *Palisavana sericiflora* is shown to possess characteristics between bird and bat syndromes but is pollinated by hummingbirds, suggesting either a transition or at an evolutionary endpoint.



Anther-stigma separation and outcrossing rates in a self-compatible daffodil

In animal-pollinated plants, anther-stigma separation (herkogamy) is considered an adaptive character that functions to limit selfing. Medrano *et al.* (pp. 1105–1111) test this hypothesis in self-compatible *Narcissus longipetalus* using allozyme markers. They show that outcrossing rates do not increase monotonically with herkogamy, a result not previously documented for any other species.

Stamens, staminodes and pollen of *Commelina* flowers

Commelina flowers possess both cryptically coloured, pollen-laden anthers, and highly advertised staminodes with little pollen. Hrycan and Davis (pp. 1113–1130) examine and compare the structure and pollen characteristics of the different stamen types in two species, explore the pollination roles each play and investigate possible breeding systems.



Rice morphogenesis, plant architecture and 3D modelling

The architecture of rice plants is characterized by large numbers of tillers and leaves. Watanabe *et al.* (pp. 1131–1143) describe rice plant architecture from 3D digitizing measurements, and construct a 3D structural model, 'Virtual Rice', using L-system syntax to digitize the pattern of rice growth and development from seedling to maturity.



Gene erosion in endangered tree species

Berberidella wilsonii var. *pubipetiolata* is an endangered tree with only four known populations in eastern China. Using allozyme analysis as an indicator of genetic erosion in recently fragmented populations, Kang *et al.* (pp. 1145–1151) detect a loss of low-frequency alleles. An excess of heterozygotes in all populations suggests that selection for heterozygotes has occurred in this species.

Optimal hydration status for *Citrus* seed cryopreservation

For non-orthodox seed species, cryopreservation is the only technique available

ContentSelect

John Bryant takes a closer look at some of this month's Original Articles



Strictly for the birds or going batty in Brazil?

I am sure that all or nearly all of our readers acknowledge that evolution is an ongoing active process. However, for more complex multicellular organisms it usually happens too slowly for us to see, although there are occasional exceptions to this. It is therefore very satisfying to find an example of an evolutionary change being proposed by SanMartin-Gajardo and Szirma, São Paulo, Brazil (pp. 1097–1103). They have studied pollination biology in two genera, *Sinningia* and *Palisavana*, in the neotropical tribe Simmingieae. Two of the studied species, *S. brasiliensis* and *P. prasinata*, are morphologically typical bat-pollinated flowers. They are also strongly scented, produce copious nectar and open at sunset. Flowers in both species last for just two or three nights. Direct observation reveals that the flowers are visited during the night by bats and that the bats do indeed transfer pollen, confirming what is deduced from floral characters. There are occasional visits during daylight by hummingbirds but these do not result in pollen transfer. However, the situation in *S. sericiflora* is much less clear-cut. Some of its floral characters are again typical of bat-pollinated flowers but other characters, including the long tubular corolla and the colour of the calyx, are more typical of hummingbird-pollinated flowers. Flower opening occurs randomly through the day and night—there is certainly no synchronous dusk opening—and the very lightly scented flowers last for several days, during which there is again copious nectar production. Observations in the field show that the only visitors are hummingbirds and that the visits, which occur only in daylight, result in pollen transfer. These data support the authors' suggestion that *P. sericiflora* is an evolutionary intermediate. In which direction the evolution is going is difficult to determine, but further field studies on related species combined with molecular phylogenetic investigations should help to solve this.

Houses and hotels have monopoly on *Helianthemum* habitats

As noted before in these pages, significant numbers of plant species are becoming increasingly rare or threatened by extinction. It is often difficult to know exactly how to ensure survival of such species, but it is seems obvious that a working knowledge of their ecology and breeding biology is essential. Thus, Javier Rodríguez-Pérez (pp. 1229–1236), based in Mallorca, one of the Spanish Balearic Islands, has studied two *Helianthemum* (rock-rose) species that occur on the islands as well as on the mainland of Spain. He performed hand-pollination experiments to determine inbreeding and outbreeding success, and also studied abundance of pollinators in the wild along with investigations of floral traits, flowering times and the effects of weather. *Helianthemum mariflorum* is mainly an outbreeder: fruit and seed set in self-pollinated flowers is only about one-third of that in out-pollinated flowers. *Helianthemum caput-felis*, however, shows no difference between self- and out-pollinated flowers. Natural pollination was mostly by hymenoptera and, in *H. mariflorum*, especially *Apis mellifera*, the honey bee. *Helianthemum mariflorum*, as a mainly outbreeding species, is more vulnerable to variations in pollinator populations, a feature that is clearly seen in comparisons between 2001 and 2002. The weather in 2002 was very wet and pollinator abundance was much lower. *Helianthemum mariflorum* showed a 50 % decrease in fruit set between these 2 years. However, this was somewhat compensated for by a much increased seedling survival in 2002. Taking all these factors into account, the author concludes that even allowing for the vagaries of the weather, it is not reproductive success that limits these two species. Instead he attributes their increasing rarity to loss of habitat through urbanization, a feature only too familiar to those of us who have visited Spain and its islands. This emphasizes the importance of setting aside refuges large enough to support viable populations, a policy which fortunately is already being implemented.

Continued overleaf

Fig. 22. ContentSnapshots and ContentSelect. These two introductions to the front matter of *Annals of Botany* were made in 2002 to help draw attention to papers appearing in each issue.

reserves (Fig. 4) increased from £999 470 in 2002 (≡ £1.37 million) to £1 449 560 by 2008 (≡ £1.73 million), more than enough to cover 2 years' operations if let down by the publisher plus 1 year of editorial costs and charitable expenditure. These healthy finances allowed the Company to launch a second journal – the online open access journal *AoB PLANTS*. The idea, born at a Company Strategy Meeting held at Exeter in September 2006, was a reaction to the increasingly large numbers of manuscripts (>75 %) being turned down by *Annals of Botany*. It was recognized that many of the rejected papers contained good publishable science. Clearly, there was a need for more capacity. Expanding *Annals of Botany* itself was rejected in favour of launching an entirely new journal. A concept note prepared by Jackson in 2007 was given only cautious support by the Company but a second such note a year later prospered and led to direct discussions with OUP and the launch of *AoB PLANTS* in late 2009 (Jackson, 2009).

At the start of the 12-year Jackson editorship, *Annals of Botany* was attracting less than 300 submissions, accepting about half of them and taking approximately 10 months to

publish papers once accepted. At the time, the Journal ranked 40th in the ISI impact factor plant science list of approximately 140 journals. By 2007, the impact factor had been raised from 1.13 to 2.94 (Fig. 20) and the ISI ranking amongst plant science journals had risen to 22nd. Almost 1000 manuscripts were being submitted annually (an increase of ~230 %). The Journal's improved appearance and varied content of Special Issues, Highlights, Invited Reviews, Reviews, Botanical Briefings, Viewpoints, Short Communications, Technical Articles, Original Articles and book reviews were thus proving popular. Only about 20 % of submissions were being accepted, thus keeping the journal's size within bounds and raising scientific standards considerably. The time taken to process submissions through to publication in the printed journal fell to about 7 months, helped by new technology and a much enlarged Editorial Board (it had doubled in size to 28) that was also highly international (11 countries being represented). The 262 papers that appeared in 2007 originated from 38 countries, the majority coming from the USA (13 %), UK, France and China (each with

10 %), Japan (9 %) and Germany (8 %). An important stage had therefore been reached in returning *Annals of Botany* to prominence as a well-cited, fully international and financially secure journal. With four Special Issues and two Highlights in the pipeline and a rising ISI impact factor, this was an appropriate moment for a new Chief Editor to take things forward.

THE YEARS 2008–2012: THE FIRST FOUR YEARS OF THE HESLOP-HARRISON EDITORSHIP

Although the Heslop-Harrison editorship officially commenced in July 2008, the Journal remained in the hands of Jackson at Bristol for a further year. When Frost transferred from Bristol to Heslop-Harrison's department at Leicester University in 2009, there was no need for the hired van or suitcase of former times to move bulky paper files, thanks to the adoption of online procedures. Frost's status was upgraded to Managing Editor in the expectation he would oversee the workings of both *Annals of Botany* and *AoB PLANTS* in one editorial office. However, this coming together did not materialize. By mid-2010, Frost was joined by Alexandra Bunning as his full time editorial assistant. This prolonged reorganization revealed, once again, the difficulties inherent in staffing, managing and moving a small editorial office and maintaining adequate cover for its core work during upheavals. The *Annals of Botany* editorial office seems to have been perennially under-staffed.

Dickinson (Fig. 23) replaced Bennett as Chairman of the Company in 2008, with Bennett staying on as a Company member. Hughes resigned in 2011 after 20 years with the Company and Heslop-Harrison (Fig. 23) left on the grounds that principles of good governance required the Chief Editor to be more independent of the Company. Hughes and Heslop-Harrison were replaced in 2012 by the biotechnologist Andrew J. Greenland and the agronomist Ian A. Donnison. Several Editors were lost [Stamp; Sheffield (after 20 years on the Board); Hacke; Buerkle; Lexer, Fry and Causton (after 20 years and a record 600+ papers handled)]. Fry's position as Botanical Briefings Editor was not refilled. The Regional Editor for Mainland Europe (Sauter) also resigned but remained a Board member. This position too was not refilled. Losses were more than met by numerous new appointments from seven countries that took the total number of editors to 32. In 2011, Shipley stepped down as Regional Editor for North America but remained a Board member. His position was taken by Jeffrey D. Karron. Nigel Chaffey (University of Bath Spa, UK) was given the new position of News Editor with responsibility for a monthly news section called Plant Cuttings. This replaced *ContentSelects* when Bryant, their writer, left the Company after 28 years of service to the Journal and Company. This stretched back to his appointment in 1982 as Associate Editor under Sutcliffe and to taking overall editorial control with Abbott at very short notice following Sutcliffe's death in 1983 (see above, The 1983 Crisis). The Journal and the Company owed him a very considerable debt of gratitude. Plant Cuttings and *ContentSnapshots* were joined at the front of the Journal by the book review section, thus giving the front end a more browsable magazine feel. The much enlarged Editorial

Board also included Alan J. Cann (University of Leicester) as Internet Consulting Editor. His task was to explore ways of exploiting the internet to increase the visibility and accessibility of *Annals of Botany* and *AoB PLANTS*. The outcome was the *AoB Blog* (Website 8) and a major presence on social media sites such as Twitter and Facebook. This was the principal innovation brought in by Heslop-Harrison in his first 4 years as Chief Editor. The technical set-up and day-to-day management of *AoB Blog* was handled by Alun Salt, a new appointment from 2010, with Heslop-Harrison having strategic control of the blog and also contributing content. In these ways, the Company was attempting to reach a wider audience for its journals and create a lively and informative online botanical community. The considerable costs associated with the *AoB Blog* and *AoB PLANTS* were met from the Company's now ample financial reserves (Fig. 4). These developments were seen as part of its charitable remit, 'To promote the science of botany . . .', as set out in the 1948 amendment to its official Memorandum of Association.

After 2008, aspects of the Journal's performance continued to improve while submissions hovered at about 1000 a year with a rejection rate of approximately 80 %. The number of papers published each year reached 262 by 2012 (Fig. 7), an all-time record. The impact factor exceeded 3 for the first time in 2009, and by 2011 had reached 4.03 (Fig. 20), this being helped by four sizeable Special Issues that appeared in 2009. Plans for six Special Issues for 2011 augured well for the future and reflected the vigour with which the *Annals of Botany* was being taken forward.

SUMMING UP

Following the re-launch of *Annals of Botany* New Series in 1937, the Journal struggled to escape from the influence of an elderly and conservative management that missed the opportunity created by the re-launch to refresh the Journal. Wartime interruptions, post-war austerity and country-wide economic difficulties hampered any significant invigoration until the late 1950s. Up to this time and for at least a further 10 years *Annals of Botany* failed to keep up with the performance and appeal of more youthful competitors and had lost almost all support from American authors. However, much ground was made up in the late 1960s, 1970s and early 1980s. Over these years the Journal enjoyed unprecedented growth in size and popularity. A switch from its hidebound publisher (Clarendon Press) to Academic Press in 1975 helped the Journal to outperform many of its rivals while retaining the broadest possible coverage of botanical topics, including applied aspects. However, despite further active management and a much expanded editorial team, continued improvement to performance proved elusive until the late 1990s. At this time, far-reaching changes to the look of the Journal and to its editorial and production practices revived the Journal's fortunes once more. This was further sustained by a timely change of publisher (from Academic Press to Oxford University Press) and the prompt adoption of online provision and digital technologies for manuscript submission, editing and production. The range of manuscript formats was widened considerably (e.g. Botanical Briefings,



FIG. 23. Hugh Gordon Dickinson (left) and John Seymour (Pat) Heslop-Harrison (right). Dickinson was Chairman of the Annals of Botany Company from 2008 to beyond 2012. Heslop-Harrison was Chief Editor of *Annals of Botany* from 2008 to beyond 2012.

Invited Reviews, Reviews in Context, Technical Articles) and the release of numerous Special Issues and sets of Highlight papers raised author and reader appeal, improved value for subscribers and increased publishing opportunities. Thus, by 2012, and despite its distant origins, *Annals of Botany* and the Company that owned and managed it were enjoying a 21st-century renaissance that had returned the Journal to international prominence and underpinned a diversification into a second journal (*AoB PLANTS*) and the innovative *AoB Blog* as an outlet for the less formal expression of botanical ideas, information and opinions.

SUPPLEMENTARY DATA

Supplementary data are available at *Annals of Botany* online, and consist of the following. Item 1: list of Members of the Annals of Botany Company, Chief Editors, editors and office staff appointed between 1937 and 2012. Item 2: opening page of typical papers from *Annals of Botany* taken from Volume I Old Series (1887) and Volume I New Series (1937). Item 3: letter from Linklaters and Paines, the Annals of Botany Company's solicitor dated 1 January 1946. This confirmed the contradictory discrepancy between the Company's Articles of Association and Memorandum of Association and concluded that the Company was not entitled to pay its members for services rendered. Item 4: 1946 amendment to the Annals of Botany's original 1903 Articles of Association that created an Executive Committee. This change allowed the Company to pay non-executive members of the Company (e.g. the Lead or Chief Editor) for their work. Item 5: a digression – avoiding income tax – the Company's prolonged efforts to avoid paying income tax (1919 and 1998). Item 6: agreement dated 27 April 1973 between Academic Press and the Annals of Botany Company. This formed the basis for Academic Press to replace

the Clarendon Press as publisher of *Annals of Botany* from January 1975.

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LITERATURE CITED

- Anonymous.** 1984. Obituary. Professor James F. Sutcliffe D.Sc., Ph.D. *Annals of Botany* **54**: 589–590.
- Brown W.** 1968. Vernon Herbert Blackman Sc.D. (Cantab.), F.R.S. 1872–1967. *Annals of Botany* **32**: 233–235.
- Chaloner WG.** 1985. Thomas Maxwell Harris. 8 January 1903–1 May 1983. *Biographical Memoirs of Fellows of the Royal Society* **31**: 228–260. <http://www.jstor.org/stable/769926> (last accessed 30 December 2014).
- Clapham AR.** 1971. William Harold Pearsall. 1891–1964. *Biographical Memoirs of Fellows of the Royal Society* **17**: 511–540. <http://www.jstor.org/stable/769718> (last accessed 9 December 2014).
- Garfield E.** 2005. *The agony and the ecstasy – the history and meaning of the journal impact factor. International Congress on Peer Review and Biomedical Publication Chicago, September 16, 2005.* <http://garfield.library.upenn.edu/papers/jifchicago2005.pdf> (last accessed 21 October 2015).

- Gunning BES. 2000.** John Heslop-Harrison. 10 February 1920–7 May 1998: Elected F.R.S. 1970. *Biographical Memoirs of Fellows of the Royal Society* **46**: 197–217. <http://www.jstor.org/stable/770396> (last accessed 30 December 2014).
- Hunt R. 1992.** Editorial. Standardization of references. *Annals of Botany* **70**: 1–2.
- Harley JL. 1981.** Geoffrey Emett Blackman. 17 April 1903 - 8 February 1980. Elected F.R.S. 1959. *Biographical Memoirs of Fellows of the Royal Society* **27**: 45–82. <http://www.jstor.org/stable/769865> (last accessed 6 January 2015).
- Jackson M. 2008.** Editorial. *Annals of Botany* **102**: 1–2.
- Jackson MB. 2009.** *AoB PLANTS*: origins and features. *AoB PLANTS* **2009**: plp002. doi:10.1093/aobpla/plp002.
- Jackson MB. 2015.** One hundred and twenty-five years of the *Annals of Botany*. Part 1: the first 50 years (1887–1936). *Annals of Botany* **115**: 1–18.
- Jackson MB, Kennedy C. 2002.** Enhanced quality of service to readers and authors of *Annals of Botany*. *Annals of Botany* **89**: 1–2.
- Larsen, PO, von Markus M. 2010.** The rate of growth in scientific publication and the decline in coverage provided by Science Citation Index. *Scientometrics* **4**: 575–603.
- Lichtenthaler H. 2004.** A history of the Federation of European Societies of Plant Physiology FESPP since its foundation in 1978. *Journal of Plant Physiology* **161**: 635–639.
- Louis WR. 2013.** *History of Oxford University Press, Volume III: 1896 to 1970*. Oxford: Oxford University Press.
- Money NP. 2012.** Cecil Terrence Ingold 1905–2010. A leading light in the twentieth-century study of fungi. *Nature* **465**: 1025.
- Moore W C. 1953.** Frederick Tom Brooks. 1882–1952. *Obituary Notices of Fellows of the Royal Society* **8**: 340–326.
- Officer LH, Williamson SH. 2014.** Purchasing power of British pounds from 1245 to present. *MeasuringWorth* 2014. www.measuringworth.com/ppoweruk/ (last accessed January 2015).
- Salisbury EJ. 1954.** Felix Eugene Fritsch 1879–1954. *Obituary Notices of Fellows of the Royal Society* **9**: 130–140. <http://www.jstor.org/stable/769202> (last accessed 6 November 2014).
- Thomas HH. 1941.** Albert Charles Seward 1863–1941. *Obituary Notices of Fellows of the Royal Society* **3**: 867–880. <http://www.jstor.org/stable/769184> (last accessed 8 July 2016).
- Website 1. 2010.** *Strike newspapers from 1959 found*. *Gloucester Citizen*. <http://www.gloucestercitizen.co.uk/Strike-newspapers-1959/story-13096067-detail/story.html> (last accessed 6 November 2014).
- Website 2. 2002.** *Dr. Alan Burges. Professor of Botany*. *Zoominfo*. <http://www.zoominfo.com/p/Alan-Burges/306465943>.
- Website 3.** *Historical UK price conversion*. <http://safalra.com/other/historical-uk-inflation-price-conversion/> (last accessed 17 January 2015).
- Website 4.** *List of UK universities by date of foundation*. http://en.wikipedia.org/wiki/List_of_UK_universities_by_date_of_foundation (accessed 22 January 2015).
- Website 5.** *List of universities in Canada*. http://en.wikipedia.org/wiki/List_of_universities_in_Canada (consulted 22 January 2015).
- Website 6.** *List of universities in Australia*. http://en.wikipedia.org/wiki/List_of_universities_in_Australia (last accessed 22 January 2015).
- Website 7.** *Royal Holloway, University of London*. <https://www.royalholloway.ac.uk/aboutus/ourcampus/home.aspx> (last accessed 22 January 2016).
- Website 8.** *AoB Blog – News and Views on Plant Science and Ecology*. <http://aobblog.com/> (consulted 10/01/2016).
- Wilson K. 1978.** The origin of the *Annals of Botany*. *Annals of Botany* **42**: 741–745.
- Yeoman MM 1999.** Obituary: Professor Robert Brown. *The Independent*, Saturday 4 September 1999. <http://www.independent.co.uk/arts-entertainment/obituary-professor-robert-brown-1115893.html> (last accessed 5 January 2015).

