

HISTORY

**One hundred and twenty-five years of the *Annals of Botany*.
Part 1: the first 50 years (1887–1936)**

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- **Background** The *Annals of Botany* is a peer-reviewed scientific journal publishing papers on a wide range of topics in plant biology. It first appeared in 1887, making it the oldest continuously published botanical title. The present article gives a historical account of events leading to the founding of the Journal and of its development over the first 50 years.
- **Sources of Information** Much of the content is drawn from the Journal's own records and from extensive Minutes, financial accounts, personal letters and notes relating to the *Annals of Botany* that were repatriated from University College, University of London in 1999. Documents held at the Royal Botanic Gardens, Kew and at the Oxford University Press Museum were also consulted.
- **Content** Emphasis is placed on the individuals who instigated, edited and managed the *Annals of Botany* up to 1937, especially the nine founding members of the Journal and the background that brought them together and motivated them to start the *Annals of Botany*. A falling out between two of the founders in 1899 is highlighted since not only did this threaten the Journal's future but also gives much insight into the personalities of those most closely involved in the Journal during its formative years. The article also examines the way the Journal was funded and how it dealt with its publisher (the University of Oxford's Clarendon Press), turned itself into a registered company (the Annals of Botany Company) and coped with the travails of the First World War, currency inflation and the Great Depression. Plans to re-start the Journal as a New Series, beginning in 1937, are discussed in the context of the competition the *Annals of Botany* then faced from younger journals.

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

INTRODUCTION

By August 2012, the *Annals of Botany* had been published without a break for 125 years. In that time it has become not only the world's oldest continuously published botanical title but one that has retained a high international standing despite the emergence of numerous popular and well-run competitors. The present article is the first of two that, together, look back over the Journal's long history.

The present article considers how the *Annals of Botany* first came into being in 1887 and the evolution of its editorship and management practices over the 50 years to 1937. These developments are described in terms of the people involved, how they organized the starting of the Journal and how they ran and financed it on a not-for-profit basis. The article pays particular attention to the lives of the nine remarkable and mostly rather grand individuals who founded the Journal and who, for the most part, came from privileged backgrounds. Despite being a youthful group (all but one were under 40), most were already establishment figures by 1887, e.g. Fellows of the Royal Society (FRS) or directors/professors of prestigious establishments, while the others were soon to become so. The present article also outlines the academic environment which allowed the

founders and their vision of modern botanical science to prosper, and describes a notable clash of personalities that almost brought the Journal down after only 12 years. In addition, accounts are given of the creation of the 'Annals of Botany Company', the effects on the Journal of the First World War and its aftermath, and how the Journal's managers looked to the future by planning a 'New Series' starting 50 years after its foundation.

SOURCES OF INFORMATION

Two previously published short accounts and one more extensive account of the inception of the *Annals of Botany* (Farmer, 1923, 1937; Wilson, 1978) have been consulted during the writing. These earlier accounts are based on a remarkable collection of >170 handwritten Minutes, letters and related documents covering the years 1885–1897. The letters are all addressed to the founding editor Sir Isaac Bayley Balfour and it is therefore likely that it was Balfour who had sufficient sense of history in the making to preserve these documents. By 1923, the collection had already been carefully examined by one of the editors, Sir John Bretland Farmer. His insightful summary of the

Mike Jackson joined the Editorial Board of the *Annals of Botany* in 1988. He was the Journal's Chief Editor from 1996 to 2007 and worked to establish the online open-access journal *AoB PLANTS*, becoming its first Chief Editor in 2009.

contents is contained in an obituary for Balfour (Farmer, 1923). It is, however, odd that 13 years later, at the Journal's 1936 Annual Meeting, Farmer is reported as being unable to write a historical account of the Annals because he 'had not the requisite information'. The best Farmer could then manage was a brief description of the origins of the Journal as part of his short Foreword to Volume 1 of the *Annals of Botany* New Series (Farmer, 1937). In 1944, Balfour's collection of early documents was deposited for safe keeping at the Royal Botanic Gardens, Kew by Vernon Herbert Blackman, the Journal's lead editor at the time. It has sometimes been referred to, misleadingly, as The First Minute Book. In 1967, its numerous individual items were ordered, numbered, mounted on card and bound by archivists at the Royal Botanic Gardens, Kew as a single volume named 'Annals of Botany Correspondence 1885–1897'. Ironically, a subsequent cataloguing error made locating this bound collection difficult for Karl Wilson, a former Secretary and Treasurer to the Journal, who instigated a search in the 1970s (Wilson, 1978). Its re-discovery by V. T. H. Parry, the Librarian and Archivist at Kew, then enabled Wilson to write the first thorough account of the conception and birth of the *Annals of Botany* (Wilson, 1978). The present article is built upon Wilson's firm foundation.

In 1999, a more comprehensive collection of letters, financial accounts and overlapping sets of unbound Minutes covering the years 1888–1911 were discovered during an office clearout at University College, University of London and passed to me by Professor J. H. A. Nugent. Some of this material is thought to comprise documents assembled by the Clarendon Press (an imprint of Oxford University Press and the first publisher of the *Annals of Botany*) and sent to Dukinfield Henry Scott (the then Chairman) in 1922. We have the covering letter from The Secretary of the Clarendon Press (R. W. Chapman) and also Scott's thank you letter dated 4 December 1922 confirming receipt of the papers. How they subsequently came to be at University College and then abandoned there is not known. The person responsible may have been Francis Wall Oliver, a member of the *Annals of Botany*'s committee from 1904 and the Quain Professor of Botany at University College between 1890 and 1925.

The Clarendon Press did not hand over all its records about the *Annals of Botany* to Scott in 1922. The archive at the Oxford University Press Museum still retains some letters and also relevant entries from the Press's letter book and order book dating from 1887 to 1937 and also from the 1960s. These were consulted whilst preparing this article, as was a set of unbound Minutes and letters covering the years 1904–1931 that have been in the possession of the Journal since at least 1978 and sometimes referred to as The Second Minute Book. These too appear to have been supplied, at an unknown date, by the Clarendon Press since all the letters carry the Clarendon's received stamp. In addition, there are well-organized Minutes of annual meetings compiled and retained by the Journal itself dating from 1931. These were handwritten (perfectly legibly) until as late as 1947.

It is remarkable that so much of the early documentation survives since the Journal was guilty of careless record-keeping in its formative years. In Scott's letter of 4 December 1922, mentioned above, he confessed 'I am afraid it is true that we have been slack in keeping a record. I have never seen a

Minute Book!'. However, thanks to the perspicacious Balfour, to efficient office management at the Clarendon Press and to a large dose of undeserved serendipity, a wealth of original documentation about the founding and subsequent development of the *Annals of Botany* has emerged. Arrangements are in hand for much of this material to be added to the existing *Annals of Botany* archive at the Royal Botanic Gardens, Kew for cataloguing and safe keeping.

BACKGROUND TO THE STARTING OF THE ANNALS OF BOTANY

The year in which the Journal published its first issue (1887) was Queen Victoria's golden jubilee year, a highly propitious time to start a new and ambitious English language botanical journal intent on publishing 'original articles, reviews and progress reports, historical notices, short notes, letters and a record of current literature'. The political and social circumstances that gave rise to the *Annals of Botany* can be linked to wholesale reforms to British education begun in about 1870 (Haines, 1958) when shortcomings in Britain's schools, universities and related institutions were being blamed for a loss of industrial and technical competitiveness compared with France and Germany. The reforms were directed by a royal commission chaired by the Duke of Devonshire (the so-called Devonshire Commission) and included Thomas Henry Huxley (a President of the Royal Society in the 1870s and known famously as Darwin's Bulldog) whose more direct influence on the founders of the *Annals of Botany* is mentioned later. The Devonshire Commission planned advanced training and research centres similar to those of German universities (Haines, 1958) with an emphasis on laboratory instruction and research instead of learning mainly from books (often ones translated from the German). Subsequent funding, both private and public, helped to create or strengthen numerous academic institutions, some of which provided education and career opportunities for the plant scientists who started the *Annals of Botany*. These reforms also increased the number of professional botanists and botanically knowledgeable teachers and thus the number of potential contributors and subscribers for the new journal. Professionalism was, at last, beginning to replace the country house amateurism that had, up until then, characterized much botanical work in Britain. In these ways, the scene was set for the launch of a journal that catered for a profession that was growing fast in Britain, and overseas, and was seeking a contemporary outlet for the results of its increasingly laboratory-based research.

THE FOUNDING HEGEMONY

The founders (in age order in 1887)

William Turner Thiselton-Dyer FRS (Fellow of the Royal Society), a morphologist, was the oldest founder (44 years old) and Director of the Royal Gardens, Kew (now the Royal Botanic Gardens, Kew). Dyer was knighted in 1899. *William Gilson Farlow* (42 years old) is considered to be America's 'first plant pathologist' (re: The American Phytopathological Society web site). His involvement was seen as vital for securing American participation in the new journal, but, due to distance, he was not involved in the *Annals of Botany*'s

origination and management. *Francis Darwin* FRS (39 years old) was Lecturer in Botany at the University of Cambridge, son of Charles Darwin and knighted in 1913 (Blackman and Seward, 1932), and a plant physiologist. *Sydney Howard Vines* FRS (aged 38), a plant physiologist and enzymologist, was Reader in Botany at the University of Cambridge but soon replaced *Isaac Bayley Balfour* FRS (34 years old) as Sherardian Professor of Botany, University of Oxford when, in 1888, Balfour moved to Edinburgh to become Keeper of the Royal Botanic Garden and the Queen's Botanist in Scotland, positions previously held by his father. Balfour was awarded corresponding membership of the New York Academy of Sciences in 1898 in recognition of his contribution to starting the *Annals of Botany* (Prain, 1924) and was knighted in 1920. Balfour held a long-term interest in plant distribution and was a notable systematist. *Dukinfield Henry Scott* (33 years old and an FRS from 1894), a palaeobotanist, was Assistant Professor in Biology at the Science School, South Kensington and destined to become the first 'Keeper' of the recently founded Jodrell Laboratory at Kew. Scott was the youngest son of the famous gothic revival architect Sir George Gilbert Scott (Rendle, 1934a; Oliver, 1935). *Harry Marshall Ward* (33 years old and an FRS from 1889) was Fellow of Christ's College, Cambridge and held the Chair of Botany at the Forestry Department of the Royal Indian Engineering College, Cooper's Hill, Egham. Ward co-authored the first paper to appear in the *Annals of Botany* (Ward and Dunlop, 1887) and became Professor of Botany at Cambridge in 1895 (Ayres, 2005). Ward was a mycologist and plant pathologist. *Frederick Orpen Bower* FRS (aged 32 years), an evolutionary morphologist, was next to the youngest in the group and already Regius Professor of Botany at the University of Glasgow (Walton, 1948) having secured the post in 'competition' with Ward and Gardiner. *Walter Gardiner* (28 years old) University Demonstrator in Botany at Cambridge University (Hill, 1941), was only 2 years away from being made the then youngest FRS based on his identification, using fresh material, of what we now know as plasmodesmata. Photographs of the founders, in later life, are shown in Fig. 1.

Links that bound the founders together

The founders were a closely knit group. A shared professional history during the 1870s and 1880s underpinned their ready coalescence around the new journal catering for their interests and those of their contemporaries. There are four readily identifiable influences that encouraged the founders to make common-cause.

von Sachs and de Bary An overarching ambition of most of the founding editors was to promote what had been called 'New Botany' (Vines, 1907). 'New Botany' is hard to define, but apparently encapsulates an approach to research based on experiment as well as observation and an interest in plant functionality and process. Meticulous methodology, most often laboratory based, was often a major component. It could be viewed as a professionalized resurgence of pioneering studies of plant behaviour begun in England in the previous century by amateurs such as Stephen Hales and Thomas Andrew Knight and earlier in the 19th century by Erasmus and Charles Darwin. However, in practice, it was inspired primarily by the work

of German botanists, especially the distinguished plant physiologist Julius von Sachs based in Würzburg and Anton de Bary, the pre-eminent mycologist working at Strassburg (present-day Strasbourg). All the founders, except Dyer, visited Sachs or de Bary at least once in the 1870s and early 1880s. Farlow spent 2 years with de Bary from about 1872 (Vines, 1919), and Balfour spent the winters of 1877/1878 and 1878/79 working with de Bary and von Sachs (Prain, 1924). As a boy, Vines had been to school in Germany and was sufficiently proficient in the language to translate von Sachs' *Textbook of plant physiology* while a lecturer at the Science School at South Kensington (1875). He visited von Sachs and de Bary in 1875, in 1877 and again in 1879 and 1880 (Ayres, 2008, chapter 8). Between 1876 and 1879, Bower studied with von Sachs [accompanied by Vines in 1877 (Walton, 1948)] and also with de Bary. Ward corresponded extensively with de Bary before visiting him in Strassburg for 2 months in 1882 (Ayres, 2008). In 1887, the Clarendon Press published Ward's translation of von Sachs's *Lectures on the physiology of plants*. The book is reviewed anonymously (probably by Vines) at the end of the first issue of the *Annals of Botany*. Darwin, a fluent German speaker, visited Würzburg for several months in 1878/1879 but, famously, was snubbed when returning some years later to discuss contradictory results with von Sachs (Ayres, 2008). Darwin also visited de Bary in 1881. Scott was at Würzburg under von Sachs in 1880/1881 and again in 1882 where he overlapped with Gardiner who spent the summer in Würzburg (Hill, 1941) and apparently referred to von Sachs as 'The Master'. It is hard to overestimate the impact of von Sachs and de Bary on the professional development of the Journal's founders. Despite their disparate research interests (plant physiology, systematics and plant distribution, cytology, mycology, pathology and morphology), all the above found inspiration in Würzburg and Strassburg.

The Science School at South Kensington The biology course at South Kensington, with T. H. Huxley as its driving force, was distinctive in the UK in that laboratory work took priority over book-based learning. According to Green (1914), the course 'prepared the way for a total revolution in the methods of botanical study'. The need for demonstrators and instructors brought Dyer and Vines to Kensington in the early 1870s, and Ward was one of their students (Dyer, 1907; Ayres, 2005, chapter 2). Bower was an assistant and instructor at Kensington from 1880 until leaving in 1885 to become Professor of Botany at Glasgow University. He was replaced by Scott who stayed until 1892 (Rendle, 1934a) and, like Bower, held some of the classes at the Jodrell Laboratory, Kew. Scott collaborated with Bower in translating de Bary's book *Comparative anatomy* in 1884 (Lang, 1949). There was also a link between Huxley and Balfour, the latter acting as Huxley's assistant at the University of Edinburgh between 1874 and 1877 while he stood in for Sir Wyville Thomson as Deputy Director of Natural History (Prain, 1924).

Dyer's influence Dyer was a strong-minded authoritarian and arguably the most influential British botanist of his day. Dyer had held numerous posts before succeeding his father-in-law Sir Joseph Dalton Hooker as Director of the Royal Gardens at Kew in 1885. He made an educational impact through his teaching at the Science School at South Kensington from

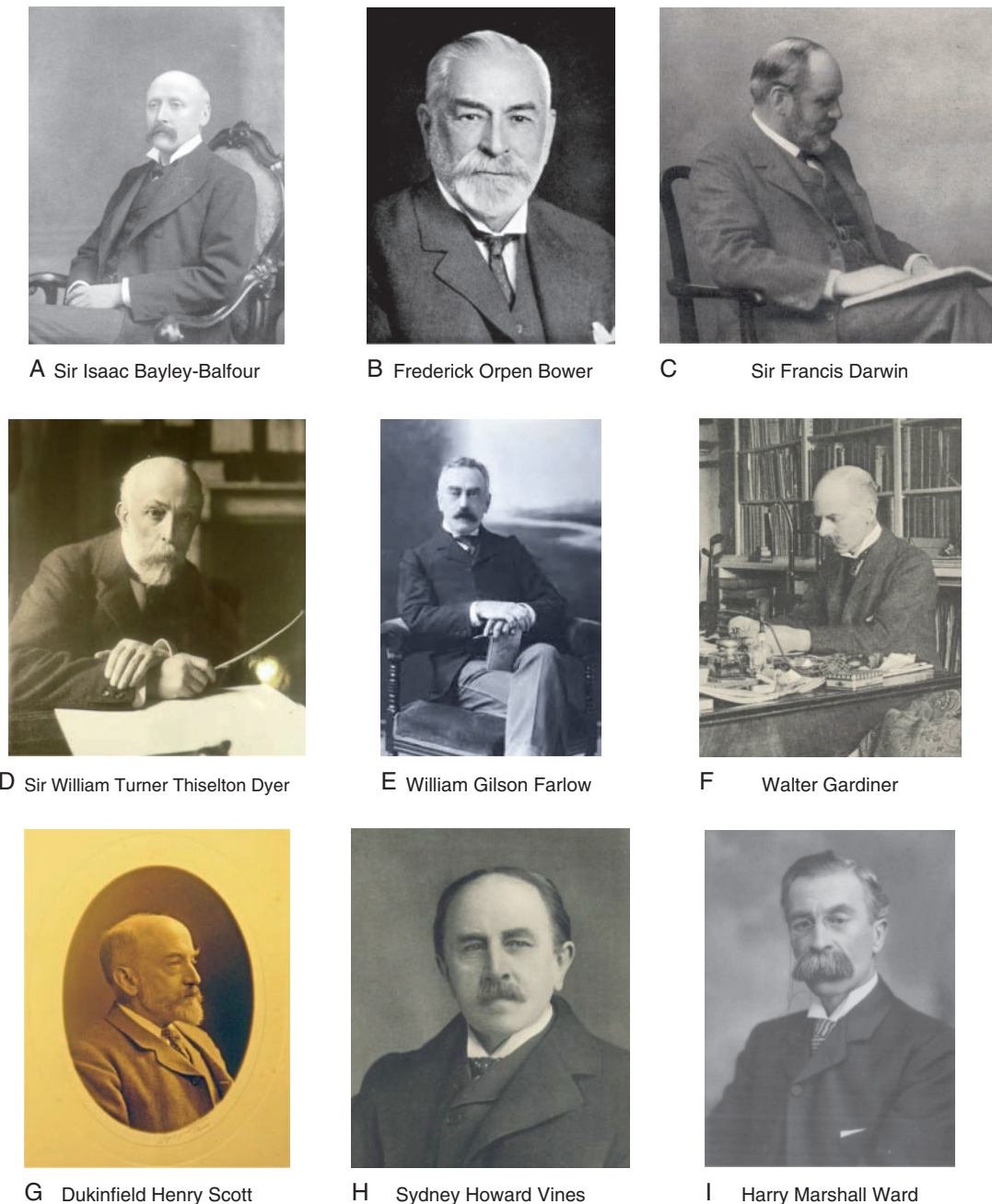


FIG. 1. Portraits of the nine founding members of the *Annals of Botany* taken in later life. (A) Sir Isaac Bayley Balfour, (B) Frederick Orpen Bower, (C) Sir Francis Darwin, (D) Sir William Turner Thiselton-Dyer, (E) William Gilson Farlow, (F) Walter Gardiner, (G) Dukinfield Henry Scott, (H) Sydney Howard Vines, (I) Harry Marshall Ward. Sources of the photographs: (A) Prain (1924); (B) Lang (1949); (C) Blackman and Seward (1932); (F) Hill (1941); (I) Vines (1907). D and G are reproduced with the permission of the Board of Trustees of the Royal Botanic Gardens, Kew, UK. E is from the American Phytopathology Society's web site.

1874 (see above) and influenced numerous academic appointments and government-funded projects nationally and in the British dependencies. It was Dyer who recruited Vines to help him at South Kensington when Vines was still an undergraduate at Cambridge (Ayres, 2008, chapter 8). He also helped Vines with his pioneering book *Lectures on the physiology of plants* that appeared in 1886 (Vines, 1886). Dyer was Bowers's external examiner at Cambridge in 1875 and it was Dyer who, in 1879, advised Scott to work at Würzburg which he did for

almost 18 months from 1880 and again in 1882. Having worked with the Devonshire Commission to establish and fund the Jodrell Laboratory at Kew (for the study of 'Physiological Botany'), Dyer appointed Scott as its first Honorary Keeper in 1892 (Rendle, 1934a). Dyer also invited Gardiner to work at Kew in 1882 where he would have worked closely with Scott and Bower who were already there at Dyer's behest. Gardiner met and later married a cousin of Dyer's wife (I. W. Campbell), and Gardiner's first paper to the Royal Society in 1883 was

read by Dyer (Hill, 1941). When, in 1884, Balfour vacated his position as Regius Professor of Botany at Glasgow to take the Chair at Oxford, it was Dyer (with J. D. Hooker, his superior at Kew) who, for obscure political reasons (see Ayres, 2005, chapter 4), engineered his replacement by Bower in preference to Gardiner or Ward. However, Dyer worked to secure Ward's first professional post as Government Cryptogamist in Ceylon (1879) and was a co-sponsor of Ward's election to Fellowships of the Linnaean Society (1886) and of the Royal Society (1888). Similar influences probably affected the fortunes of other founders of the Journal too. No direct influence by Dyer on the early academic life of Balfour has yet come to light. As the oldest and most experienced of the founders, Dyer came to exert an enormous affect on their early professional lives.

The University of Cambridge Thanks largely to the efforts of Vines, Cambridge became the dominant force in teaching and research in the 'New Botany' in the years leading up to the starting of the *Annals of Botany*. Many of the founding committee members had strong links with this University. Vines graduated there in 1875 and was soon taken on as Lecturer when science teaching was being re-organized by Sir Michael Foster (Rendle, 1934b). Although Foster was an animal physiologist he had recognized the need for Cambridge to expand into plant physiology (Ayres, 2008). In 1877, Vines started the first practical botany classes at Cambridge using microscopes bought with his own money (Hill, 1941; Ayres, 2008, chapter 9) and, in 1883, became the University's first ever Reader in Botany and was successful in attracting >100 students in one year alone (Green, 1914; Ayres, 2005, chapter 7). Vines's practical classes in botany were based on a course originally conceived by Dyer at The Science School, Kensington, and were published in 1886 as *Lectures on the physiology of plants* by Cambridge University Press – the first British text book on plant physiology that was not a translation of a German text (Vines, 1886). Several of the other Journal's founders were taught by Vines. Thus, Bower entered Cambridge in 1874, Ward graduated there in 1879 and Gardiner did so in 1881. Gardiner then joined Vines as Demonstrator. Darwin was appointed Lecturer in Botany at Cambridge in 1882 following his father's death and, with Vines and Gardiner, shared the teaching workload until Vines left for Oxford in 1888 to replace Balfour as Sherardian Professor of Botany. The Cambridge effect, brought about largely by the herculean efforts of Vines, thus bound together the majority of the founding committee and spearheaded the progression of their 'New Botany'.

STARTING THE JOURNAL

Two years of preparation

When the Journal first appeared in August 1887, Balfour was the first-named editor and chaired the management committee, with most of its members remaining anonymous and self-effacingly referred to at the front of the Journal as 'Other Botanists' (Fig. 2). Only 4 months previously, Balfour had selflessly offered the top position to Dyer (in correspondence catalogued in the Kew Archive as letters from Balfour to the Hookers) but Dyer, quite properly, must have declined. Balfour's position was entirely appropriate since it was he

who conceived the idea, had the vision to involve an American botanist and initiated discussions about a possible new journal with Vines, Sir Joseph Dalton Hooker (recently retired as Director of The Royal Gardens, Kew) and with Dyer (Wilson, 1978). These discussions began no later than July 1885, when the ever-influential Dyer wrote back to Balfour 'As to the journal, I am with you'. Dyer also suggested the *Quarterly Journal of Microscopical Science* (now *Journal of Cell Science*) as a model to be bettered (this advice was adopted) and ended with '...you must be the boss...'. Although Balfour was the founding visionary, workaholic Vines was the enabler who turned the vision into a reality. His appointed position as the second editor to Balfour (Fig. 2) was well earned.

Vines had offered Balfour his services as co-editor in February 1886 and then worked tirelessly, often to astonishingly short deadlines, to bring the Journal to fruition by August 1887. One of his tasks was to take on tetchy and ultimately unfruitful negotiations with James Britten (later Sir James Britten) editor of the well-established *Journal of Botany* (based at The British Museum in London). Britten saw the proposed new journal as a threat to his own and was too inflexible to accept Vines's suggestion of expanding his (Britten's) journal to accommodate the kinds of papers Vines and Balfour wanted to attract. The indefatigable Vines also took responsibility for chairing and summarizing at least three of five meetings held

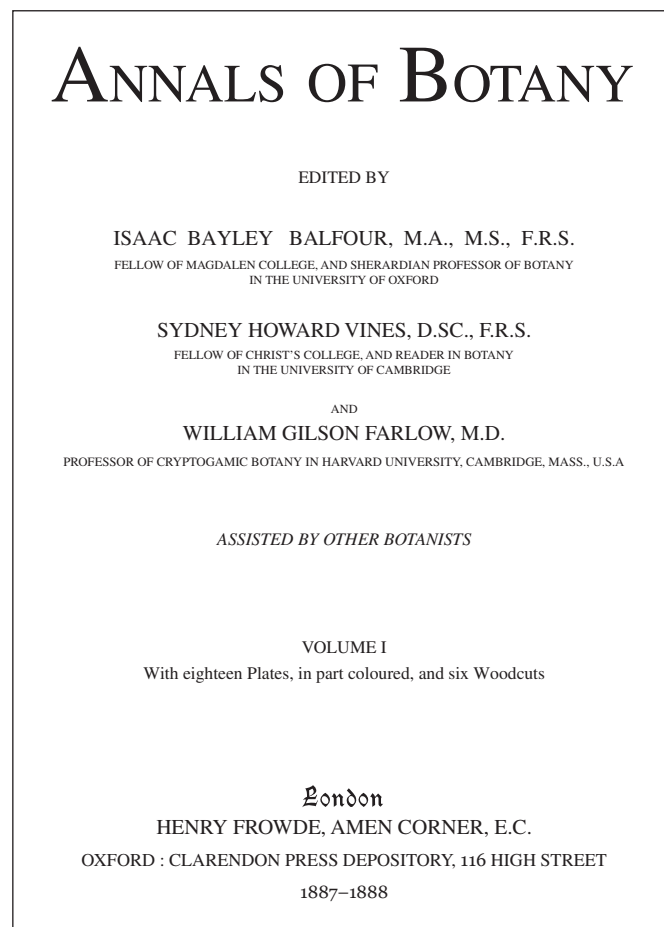


Fig. 2. Front piece of the first issue of the *Annals of Botany*, August 1887.

in London between October 1886 and May 1887 to which botanists were invited to discuss the project and indicate their support. The first invitation ([Supplementary Data Item 1](#)), dated 11 October 1886, gave only 10 days notice to attendees, but it induced a flood of prompt and mostly supportive replies. The second of these meetings, on 20 January 1887, fleshed out the structure of the proposed Journal and named it *The Journal of Botanical Science*. The January meeting also gave Balfour and Vines clearance to write to the Clarendon Press (a recently started imprint of Oxford University Press) inviting them to publish the Journal. Balfour had already worked with the Clarendon to arrange English translations of German texts such as a botanical manual of von Sachs that was put together by Dyer and A. W. Bennett ([Prain, 1924](#)). It was therefore entirely to be expected that the Clarendon Press would be Balfour's first choice for his embryonic journal. Vines's handwritten account of this key second meeting and a copy of the somewhat long-winded letter sent to the Clarendon Press by Balfour and Vines are given in [Supplementary Data Items 2 and 3](#).

An entry in the order book of the Clarendon Press (Delegates Order No. 10) makes it clear that, by 4 February 1887, its managers (the so-called 'Delegates') had reacted favourably to the Balfour/Vines letter. They replied to it positively just 4 days later. The Press wrote to Balfour again on 18 February 1887 (Delegates Order No. 12) explaining that they would need reasonable financial security against loss but '*...would enter into it [i.e. the project] in the interest of Botanical Science without any view of securing a profit to the Press.*' ([Supplementary Data Item 4](#)). This positive and generously phrased letter must have been all that Balfour and Vines had hoped for and was appropriate reward for their hard work and belief in the notion of a modern botanical journal. The first issue of the Journal appeared just 6 months later, a remarkably short time in which to launch a publication from scratch. It not only suggests that Vines and Balfour had already signed up authors for the first issue well in advance but also demonstrates that the Clarendon Press could deal effectively and promptly with the complexities of initiating, producing, selling and distributing a journal with international reach and with high standards of production especially regarding illustrations. The choice of publisher had been a sound one.

During the run up to publication, Balfour and Vines were having difficulty with a series of complicated and somewhat rambling handwritten letters from Sir Joseph Dalton Hooker. They verge on illegibility; their content was, for the most part, unpalatable to Balfour and Vines. Hooker was generally scathing about the botanical journal they were proposing and told Balfour that he (Balfour) did not have enough spare time for it and that '*...it will be his death knell*'. As late as 28 April 1887, Vines confessed to being depressed by Hooker's '*wholesale condemnation of the scheme*'. Bothersome though Hooker's combative views were, Balfour and Vines took many of them seriously. Hooker had, after all, been a very close friend and long-term supporter of Charles Darwin ([Green, 1914](#); [Ayres, 2008](#)), was a former President of the Royal Society and remained an influential and highly productive botanist despite having retired as Kew's Director 2 years previously. Eventually, Hooker warmed to the Journal a little, while at the same time heavily criticizing various drafts of a promotional prospectus being drawn up by Vines and Balfour. His

interventions led to four revisions between February and May 1887. The final version ([Supplementary Data Item 5](#)) was distributed shortly after being approved on 5 May 1887 at the last of the five planning London meetings.

Choosing the Journal's title

As already mentioned, the name initially chosen by Vines and Balfour for their new Journal was *The Journal of Botanical Science*. Later, it was shortened to *Journal of Botanical Science*, but this further heightened the risk of confusion with the existing *Journal of Botany*. The latter was started in 1834 by Sir William Jackson Hooker, then Director of the Royal Gardens, Kew. As already explained, his son and successor at Kew, J. D. Hooker, was highly critical of the potential competitor to his father's old journal. Nevertheless, it was J. D. Hooker who, in one of his scrawled letters, suggested that 'Annals' should be included in the journal's title ([Wilson, 1978](#)). Vines agreed with this and told Balfour so. The result was an amendment to the troublesome Prospectus in late March 1887 which revised the title to *Annals of Botanical Science* ([Fig. 3](#)). However, by 30 April 1887, at the fourth of the London discussion meetings (in this instance invitees were given only 4 days notice!) the name was changed for a third and final time to *Annals of Botany*. Exactly what inspired this last minute switch is not clear. Perhaps someone had recalled the long-defunct '*Annals of Botany*' published in London by König and Sims some 83 years previously ([Greene, 1958](#)) and recognized its palpable suitability. The question interested V. H. Blackman, the principal editor of the Journal in 1936. He asked the Clarendon Press for an explanation. They could not provide one and stated that the title change was not of their doing and speculated that '*...the shortness of "Annals of Botany" told in its favour*'.

Money

In early 1887, Vines, who was in charge of finance, asked each of the founding editors, except for Farlow, to contribute to a Guarantee Fund of about £200, repayable by the Clarendon Press if and when a surplus ever accrued. An entry in the Clarendon Press order book dated 13 May 1887 makes it clear that the £200 and the pledge of sincerity it represented gave sufficient backing for the Clarendon to agree to publish 500 copies of the first volume. Two hundred pounds was a substantial sum in 1887 and equivalent to £18 800 of purchasing power in 2012 ([Officer and Williamson, 2014](#)). The founding editors clearly had sufficient confidence in the new journal personally to invest quite heavily. The first volume of four issues (issues 3 and 4 were combined) cost £403 15 shillings and 10 pence (£403:15s:10d) all told to produce (equivalent to £38 000 in 2012), and the Press drew on one-third of the Guarantee Fund to help pay for it. The four issues of the first volume together contained 18 pages of plates, >540 pages of text comprising 36 papers or shorter notes plus various entries such as notices of books and reviews, a detailed necrology of recently deceased botanists and a monumental 'Record of Current Literature' (assembled by Vines with later help from Farlow and a certain Dr Schönland). The latter item amounted to an overly ambitious forerunner of the well-known ISI Current Contents. Its great

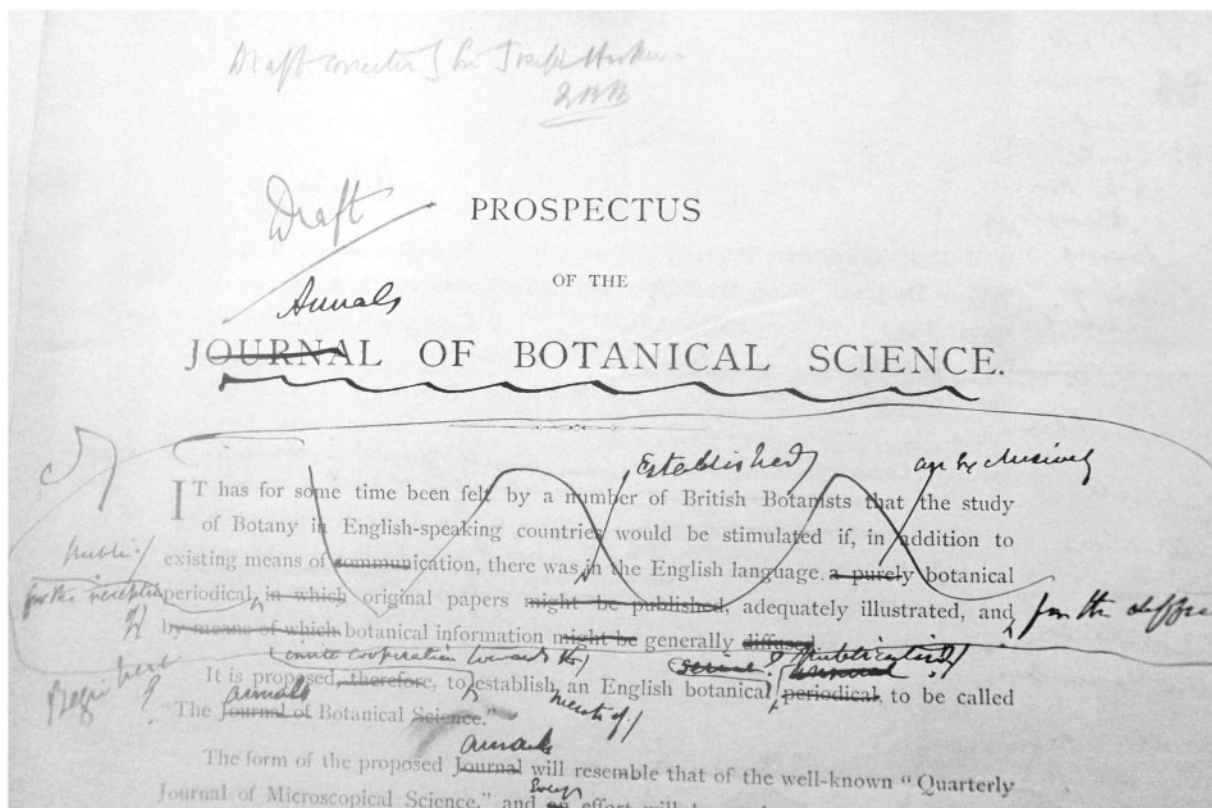


FIG. 3. Detail from revisions to the third draft of a 'PROSPECTUS' to be used to promote the Journal dating from late March 1887. The changes are in S. H. Vines's handwriting and show the initial response to Sir Joseph Dalton Hooker's suggestion to use 'Annals' in the Journal's title. *Annals of Botanical Science* was soon abandoned in favour of *Annals of Botany*. Original source: 'Annals of Botany correspondence 1885–1897' and reproduced with the permission of the Board of Trustees of the Royal Botanic Gardens, Kew, UK.

length (19 pages for 1887 alone) and the absence of modern-day electronic communications and digital technologies made compiling the 'Record of Current Literature' unsustainable, and it was dropped at the end of 1890.

Surprisingly perhaps, some of the plates were beautifully hand tinted. An example from Volume II is shown in Fig. 4 (Masse, 1888). At the time, its American competitor *Botanical Gazette* (founded in 1876 by the Chicago University Press) did not contain colour plates. Authors probably paid for these coloured illustrations since Bower is reported to have paid £25 for his plates in Volume III. However, generally, there were no fees or page charges and authors were given 25 free offprints. One hundred and seventy-one subscribers each paid a guinea (a guinea comprised £1 and 1 shilling, i.e. 21 shillings) for Volume I (equivalent to £98.86p in 2012). Note that in Victorian Britain, tradesmen and shopkeepers were usually paid in pounds while more refined folk such as artists, writers and, of course publishers, often priced their services in guineas. A leather-bound Volume I cost £1 and 16 shillings (equivalent to £169). In 1889, the subscription price for a yearly unbound volume was increased almost 50% to about £1 and 10 shillings (equivalent to £140) and remained at this level for >30 years.

THE 1899 CRISIS

Twelve years after the *Annals of Botany* first appeared, a dispute arose between Vines and Dyer, two prominent members of

a still unchanged committee. This falling out occurred despite Vines and Dyer being very close in earlier years. For example, it was Vines's stated wish for Dyer to be involved with the Journal from its inception (letter to Balfour, February 1886, held at Kew), but their relations became soured. The 1899 Crisis presented the first serious challenge to the cohesiveness of the founding hegemony and the survival of the Journal. Hurt feelings, touching personal exchanges and some impressive if largely ineffective diplomacy on the part of Balfour are revealed in an extraordinary collection of 80 letters, postcards and handwritten notes rescued from University College, University of London 100 years after the crisis. This correspondence, dated 9 January to 28 February 1899, is principally between Balfour (Royal Botanic Garden, Edinburgh) and Vines (University of Oxford) or Scott (Royal Gardens, Kew). They were the Journal's three principal editors at the time (in addition to Farlow, the editor for America who was not party to these events). There are also key letters from Balfour to Bower and Dyer and lesser exchanges with others of the Committee. Someone, presumably Balfour, thought this correspondence sufficiently important to secure it between neatly lettered brown cardboard (Fig. 5) and to tie it up with stout string. This flurry of correspondence was so intense that numerous letters crossed in the post (e.g. four were written on 8 January and seven on 9 January) adding to the general irritation and vexation, as well as being a testament to the speed and dependability of the British Post Office at that time.



FIG. 4. Example of the tinted plates used to illustrate some of the articles in early issues of the *Annals of Botany* (Massee, 1888).

The crisis unfolds

In early January, just prior to the 1899 Annual Meeting set for 27th of the month, Vines told Scott of his intention to resign unless his (unspecified) difficulties with Dyer were dealt with. Although Scott's view was that this was just 'moonshine' (note to Balfour dated 9 January 1899), things came to a head at the Annual Meeting itself when unminuted exchanges resulted in Vines abruptly walking out (at the Royal Society's Rooms in Piccadilly, London) after threatening to resign unless something was done about Dyer's attitude. The incident was clearly described by Balfour in an explanatory letter dated 9 February ([Supplementary Data Item 6](#)) written for the benefit of Bower, who had not been able to attend the January Meeting. Balfour's letter to Bower indicates that Dyer wished to publish a paper in the Journal without reference to Vines, who he thought acted dictatorially in his running of the *Annals* (and who, by implication, may not have been minded to accept the Dyer manuscript). Dyer's apparent bullying of Vines brought the Journal to near collapse and invoked much soul-searching. The correspondence relating to 'The 1899 Crisis' includes Vines's written threat

to resign as soon as he had the March 1899 issue of the Journal assembled for publication. Numerous letters also express Vines's deep sense of hurt at the hands of Dyer (see below) and document the painstaking if somewhat obsequious attempts by Balfour to defuse things. It was particularly awkward for Balfour because Vines wanted the Committee, as a whole, to meet and evaluate his complaints about Dyer. On the other hand, Balfour (and Scott) saw the matter as a personal quarrel and actively encouraged Vines to patch up his quarrel with Dyer directly. Neither Balfour nor Scott had the courage to tell Dyer he should put the good of the Journal first and consider patching things up with Vines, even though Dyer was the antagonist. Accordingly, Balfour wrote often to Vines but much less often to Dyer. One of his rare letters to Dyer (12 February) is extraordinarily sycophantic and emollient while also telling Dyer bluntly 'I have told you before now that your criticisms are sometimes put with a directness which does not tend to soothe irritation if it exists and you do "rub it in"...'. The entire letter is reproduced in [Supplementary Information Item 7](#), since it also sheds light on the debt Balfour seems to have owed to

Dyer for his help in developing the Royal Botanic Garden at Edinburgh. This debt of gratitude may explain why Balfour repeatedly pleaded with Vines to make up with Dyer but never asked Dyer to reconcile his differences personally with Vines. The best Balfour can manage is to ask Dyer if there is anything he (Balfour) can do to ‘. . .pave the way to a better understanding between you [and Vines] than has been evident for some times past. . .’.

Vines’s paranoia

After bottling up his feelings for years, Vines finally reveals them in a rapid succession of letters to Balfour and Scott. The following extracts show something of his distress. On 29 January just before the fateful 1899 Annual Meeting, Vines wrote to Balfour and Scott – ‘*I feel something must be done. . .to put a stop to the scenes which have so frequently disgraced our meetings – I simply cannot and will not endure these annual vilifications any more*’. In a letter to Balfour dated 5 February, Vines wrote: ‘. . .no one with a particle of self-respect could put up with Dyer’s treatment any longer. I think I have been patient year after year but the unpleasantnesses have recurred – But now the time has come that they must stop’. On 8 February, Vines again wrote to Balfour: ‘*There has been for fifteen years a growing hostility between Dyer and myself – He has lost no opportunity of persecuting and maligning me.*’ and ‘*I am sick of the wrangle which is & has been for many years invariably associated with the meetings of the Committee – and I really do not see why I should [take] it any longer. I cannot, on any consideration, go on in the future as in the past.*’ and ‘*Dyer’s attacks on me have always been so skilfully arranged that as no formal mention is made*’. In a tirade to Scott, on 12 February Vines alleges that ‘. . .he (Dyer) wants Kew to be the botanical centre and himself the botanical boss. I am quite ready to follow Dyer – but I object to being dragged after him, like a fractious dog, with a collar and chain’. There are many more similar expressions of distress in numerous other letters. The hurt felt by Vines was compounded by ill health. Its nature was never made clear, but it was thought by Balfour to have contributed to the situation. In a letter to Bower dated 9 February 1899, Balfour states ‘*We also all recognise that Vines is in that condition of health which makes him very sensitive to criticism*’. In a letter to Dyer, written on the same day (Supplementary Data Item 7), Balfour suggests Vines’s sensitivity ‘. . .is a consequence of his ill health at Oxford.’, and states ‘. . .We may conscientiously say that Vines must have been ill at the last Committee meeting’.

The journal comes close to collapse

On 14 February 1899, a letter from Scott to Balfour reported that Dyer repudiated any notion of unfriendliness towards Vines, refused to contemplate a meeting with Vines and threatened to retire from the Annals Committee. This triggered some highly diplomatic letters from Balfour, but, on 16 February, Balfour confessed to Scott that he had had enough and would no longer work towards ‘. . .making a bridge for Vines to retreat.’ And that, if Dyer too retires from the



FIG. 5. The 1899 Crisis. Lettered card protecting the collected correspondence dated January and February 1899 between Isaac Bayley Balfour (chairman and lead editor), Sydney Howard Vines (editor and *de facto* manager), Dukinfield Henry Scott (editor), William Turner Thiselton-Dyer (committee member) and other members of the *Annals of Botany* Committee.

Committee it ‘...*would be the beginning of the end of the whole enterprise I believe*’. Dyer had already tried to resign as an editor 6 years before but was persuaded to stay on. On 16 February 1899, Balfour pleaded with Dyer not to stand down from the Committee this second time. The letter ends with the terse conclusion that – ‘*If you resign it means complete wreck of the Annals on its present basis*’. Dyer did not resign but the tormented Vines did. The March 1899 issue was his last as editor. Scott quickly stepped into Vines’s shoes, no easy task since Vines seems to have done most of the day to day management in addition to compiling the Journal, looking after the finances and dealing with the publishers. Scott had some mixed feelings about taking on the job. In a letter to Balfour at the start of ‘The 1899 Crisis’, he confessed to often being upset by Vines’s letters over the years and was reluctant to take on his work, telling Balfour ‘*I will not undertake the bother of running the Annals and [undecipherable] for Vines’s convenience...*’. So, it seems Vines too could be a difficult man to deal with.

A postscript

Although Vines resigned as editor in 1899, he did not resign from the Committee until 1902. At the 1900 Annual Meeting (which both Vines and Dyer attended) Committee members expressed their collective thanks ‘...*for his long service as Editor and of the regret which his retirement evokes*’. The Committee did so again in a most fulsome and sensitive manner at its 1901 Annual Meeting. The text, reproduced in [Supplementary Information Item 8](#), makes it abundantly clear that the Committee fully recognized Vines’s huge contribution to the *Annals of Botany*. Six years then passed before Vines was successfully encouraged to re-engage with the Annals. Then, the 1907 Annual Meeting agreed that Vines should be asked to write an appreciation of Ward (who had died the previous year) and to rejoin the Committee. Vines’ obituary for Ward was duly published (Vines, 1907), but it was not until May 1911 that Balfour finally wrote asking Vines to return to the Committee. Vines accepted despite complaining of being overworked at Oxford. He also asked to be excused from formal evening dress at the usual post-meeting dinner that year due to a need to hurry back to Oxford immediately after the meal.

THE LOSS OF THE FOUNDERS FROM THE JOURNAL

The first to resign, in 1905, was the American editor Farlow. He recommended his Harvard colleague, Roland Thaxter, Professor of Cryptogamic Botany, as successor. Thaxter took up his duties in 1907 and served until 1932. Ward died in 1906 probably from Type-1 diabetes and perhaps also from stress linked to his efforts in establishing Cambridge’s impressive purpose-built botanical laboratory opened 2 years before (Ayres, 2005) and still in use today. In a letter sent to the Secretary of the Clarendon Press on 4 November 1912, Balfour resigned from the Chairmanship, although it is not entirely clear if he also left the Committee. Minutes of the 1913 Annual Meeting record the Committee’s ‘...*warm thanks to Professor*

Balfour for his invaluable services as editor of the Annals from its foundation and their deep regret at his retirement.’ Balfour died 9 years later, when Scott wrote to R. W. Chapman (Secretary to the Clarendon Press) that ‘*we must commemorate him in a fitting way*’. However, little appears to have been done other than publishing an obituary (Farmer, 1923). In 1912, Balfour’s editing work passed to Francis Wall Oliver FRS, of University College, University of London who was already a Committee member. Dyer resigned in 1917. A possibly disingenuous entry in the Minutes of the 1917 AGM states ‘*The Annals of Botany Company accepts with great regret the resignation of Sir W. T. Thiselton-Dyer, and wish to express to him their warm thanks for his invaluable services in connection with the inception of the enterprise and at critical moments in its development. And for his constant support and help all through*’. His place was taken by Arthur William Hill FRS. Hill was Assistant to Sir David Prain, Director at Kew and succeeded him in that role in 1922. Hill had been a student at Cambridge where he came under the influence of Ward and Gardiner. Gardiner resigned from the Committee in 1919 and was replaced by William Henry Lang FRS, the first Barker Professor of Cryptogamic Botany at the University of Manchester. The 1921 Annual Meeting reported that Vines had resigned from the Committee. Vernon Herbert Blackman FRS, the first Professor of Plant Physiology and Pathology at Imperial College, University of London, replaced him and also became an editor. Darwin attended his last Annual Meeting in 1922 and died in September 1925. He was replaced by Felix Eugen Fritch FRS Professor of Botany at Queen Mary College, University of London. Scott resigned in 1932, but the Committee asked him to retain the Chairmanship. At his death in 1934, Scott had served the Journal continuously for an impressive 47 years. He was succeeded as Chairman by Albert Charles Seward FRS (Sir Albert from 1936), Professor of Botany at Cambridge. Bower attended his last Annual Meeting in 1937 – 51 years after the Journal began. He was the longest serving founder and died in his early 90s in 1948. It is clear that each of the founding editors was succeeded by men similarly drawn from the upper echelon of the British botanical establishment. A table showing all members of the Committee and editors who served between 1887 and 1937 is given in [Supplementary Information Item 9](#).

EVOLUTION AND CHANGE

In his preface to the first issue of the New Series of *Annals of Botany* in 1937 Sir John Farmer stated: ‘*The only material change in the character of The Annals since its first appearance has consisted in the disappearance of the “Record of Current Literature” from the fifth and all subsequent volumes, and its replacement by additional original papers.*’ (Farmer, 1937). This suggests there is little to add to how the Journal developed during the 50 years following its founding. However, with Minutes now available for almost every annual meeting of the Journal between 1887 and 1937 and additional financial accounts and letters covering many of these years, a story has emerged that is worth relating. This includes the creation of a legal entity (the Annals of Botany Company) and dealing with the impact of the First World War and the subsequent financial

recession. It has been possible to track the Journal's progress in terms of accumulated wealth, subscriptions and adjustments to the Journal's workings, presentation and service to readers and authors. These developments are described below in terms of 'Management', 'Finance and sales' and 'Design and production' for the periods 1887–1912 (the Balfour Years) and 1912–1937 (the Scott/Seward years).

1887–1912: the Balfour years

Management Balfour was chairman until 1912. A list of those who served the Journal with him is given in [Supplementary Information Item 9](#). During this time, all editors (with the exception of the Editor for America) were also members of the Management Committee. Under Balfour, the Committee operated in considerable style. The rather short annual meetings (about an hour) were usually held at the rooms of The Royal Society or The British Association for the Advancement of Science at Burlington House on Piccadilly in London and occasionally at the nearby Savile Club. These meetings were usually followed by a formal dinner at The Café Royal on Regent Street or the Athenaeum Club on Pall Mall. An exception was made in 1901 when the planned dinner on 23 January was cancelled out of respect for Queen Victoria who had died the previous day after almost 64 years on the throne.

By 1900, the Journal's finances were sufficiently strong for the Committee to take advice on how best to put the Journal on a strictly legal footing and, a year later, the decision was made to form the Annals of Botany Company. By 1903, drafts of a Memorandum of Association and Articles of Association were agreed at the Annual Meeting, and the Company was finally Licensed by the Government's Board of Trade on 9 July 1903. The legal costs for setting this up were considerable [£49:17s:11d (equivalent to £4550 in terms of purchasing power in 2012)]. A Memorandum of Association set out the objectives and legal framework of the business. The main aim can be summarized as – producing and distributing the *Annals of Botany* and any other similar publication without profit to Company Members (who were only allowed out-of-pocket expenses). Separate Articles of Association set out how the Company should operate. For example, it allowed for the appointment of a Chairman and Vice-chairman, and a Secretary and other necessary officers up to a total of ten. In the following year, the Annual Meeting appointed Balfour as Chairman, Scott as Vice-chairman while the position of Secretary remained unfilled. Bower, Darwin, Gardiner, Dyer and Ward were the other members of the newly formed company. The front piece of the Memorandum of Association is shown in [Fig. 6](#)

From 1903, the first-named individual on the Journal's front piece remained that of the Company Chairman (i.e. Balfour up to 1913). The others listed beneath were those doing the active editorial work. Since there is never any mention of external referees being used to assess manuscripts, it was presumably these listed editors who evaluated the scientific content of submissions, corresponded with authors over necessary changes and made final acceptance and rejection decisions. One of the editors must also have assembled each issue and liaised with the Clarendon Press over production matters and expenses. The least that can be said is that these overworked gentlemen

no longer had to deal with handwritten manuscripts since a requirement for typewritten submissions rather than handwritten ones had been in force since 1898.

There were no women involved directly in the running of the *Annals of Botany* despite there being some notable female contributors to the Journal. These included Agnes Arber the first female botanist to be elected to the Royal Society ([Schmid, 2001](#)) and the palaeobotanist Marie C. Stopes a controversial figure who became famous for starting Britain's first birth control clinic (in 1921) and for inspiring the modern-day 'Marie Stopes International' organization.

The first injection of new managerial blood since the Journal's inception came in 1903/4 with the appointment to the Committee of Albert Charles Seward FRS (Ward's successor as Professor of Botany at Cambridge and knighted in 1936), Francis Wall Oliver FRS (Professor of Botany at University College, London) and John Bretland Farmer FRS (Professor of Botany at Imperial College, London and knighted in 1926). Their admission brought Company membership to the maximum of ten allowed by the Articles of Association. Farmer was made an editor 2 years later and took over dealings with the Clarendon Press. When Farlow resigned as Editor for America after almost 20 years (we have a charming resignation letter dated 6 December 1906), he was replaced, after a delay, by Roland Thaxter, Professor of Cryptogamic Botany and Farlow's junior colleague at Harvard. By 1911, Balfour had persuaded the hapless Vines to rejoin the Company although by doing so had increased Company membership to 11, one more than the maximum allowed. Balfour tendered his resignation 'as editor and Chairman of the Company' a year later; Oliver then became an editor. Balfour may have remained a member of the Company until at least 1917 since there is, in the archive, an invitation for him to attend that year's Annual Meeting. No mention was made in the Journal's records of any reaction to competition from *The New Phytologist* started in 1902 by Arthur Tansley (Sir Arthur from 1950) as a rather more informal alternative to the *Annals of Botany* and appealing to teachers and amateur botanists as well as professionals at university level.

There is little information on how the *Annals of Botany* advertised itself over this time. In 1889, a promotional circular was proposed and an American agent sought. In 1898, Vines reported that £13:2s (equivalent to £1236) was spent promoting the Journal. This involved the Clarendon Press placing adverts in other scientific journals in Germany, France and America and distributing a prospectus especially to selected institutions in the USA. By 1900, the Clarendon had been authorized to spend £20 per volume on advertising (equivalent to £1832).

It is appropriate to ask to what extent, during Balfour's time, the Journal's content reflected the spirit imbued in so many of the founders by their contact with von Sachs and Du Roi. Even the most casual inspection of the issues up to 1912 indicates a preponderance of descriptive morphology rather than of studies of function and process. Balfour recognized this and said as much in a letter to Dyer (12 February 1899) – '... Stodgy it [i.e. the *Annals*] is getting I agree with you and I would like much to see some vigorous all round papers in it as a relief from pure laboratory structural detail...' ([Supplementary Data Item 7](#)).

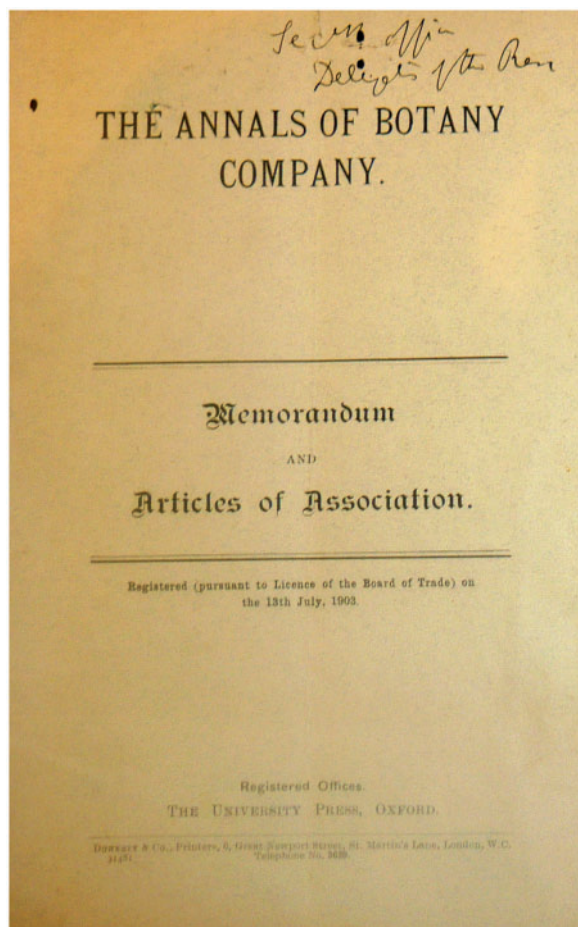


Fig. 6. Front piece of the original Memorandum and Articles of Association that created 'the Annals of Botany Company' on 13 July 1903. This document established the legal framework for operating the *Annals of Botany* and any additional publications through the newly formed Company, whose membership initially comprised the founding editors (except for Vines and Farlow). Their individual financial liability was limited to £1 (equivalent to £91 in 2012). No member could profit personally from Journal business, although recompense for costs and services rendered was allowed. The Memorandum and Articles of Association remained unchanged until 1946. (By permission of the Secretary to the Delegates of Oxford University Press.)

Finance and sales As early as May 1890, the Clarendon saw no need to make further call on the original Guarantee Fund and was '*disposed to give the enterprise ample time to establish itself*' even though a year later the running deficit still stood at over £314 (equivalent to £29 000) (Fig. 7B). We have several examples of handwritten accounts prepared by the Clarendon Press at about this time. One of these, relating to reprinting of a compendium of Baker's 1891 articles on British ferns, is reproduced in the [Supplementary Information Item 6](#). It gives a strong sense of the other-worldliness of the Clarendon's office work in the late 19 Century.

The Journal's first annual trading profit was recorded 1892, but it continued to run an overall deficit until 1897 (Fig. 7B) when the first accumulated surplus was recorded (£81:16s:11d; equivalent to £7863). The *Annals of Botany* has not been in overall deficit since. By the end of 1888, the surplus had grown to almost £136. In a note to Balfour dated 22 January 1899,

Scott called this '*an embarrassment of riches*', and Balfour wrote to Vines on 16 January 1899 '*...we shall soon be so wealthy that we shall have to have a charter of incorporation*'. Such a measure was indeed put in hand only 4 years later when arrangements were made to form a registered company (as described above). Once the first running surplus was recorded, and in accordance with the original agreement (Farmer, 1937), the Clarendon Press paid back the remains of the original Guarantee Fund, which stood at £133:6s:4d (equivalent to £12 580).

The Annals' increasingly healthy financial position in the 1890s arose not only from growing subscriptions (Fig. 6A) and also one-off sales of issues, reprints, back issues and special articles, but also from the low charges levied by the Clarendon Press which provided a comprehensive business management and production service for very little financial reward. An entry in the 1887 Letter Book of The Delegates to the Press explains that '*...the Delegates have approved to undertake the whole management and collection of subscriptions for a commission of 2.5 %*.' The Clarendon also charged an annual administrative fee of only 2 guineas (equivalent to £197.70p). Furthermore, the Clarendon's auditor, the distinguished accountant Nicholas Edwin Waterhouse (Sir Nicholas from 1920), prepared the annual accounts without charge until 1907, when 2 guineas a year was levied (equivalent to £188.10). By 1906, income was sufficient to attract liability for UK Government income tax. In 1910, the cash balance held by the Clarendon on behalf of the Journal was £1140:5s:6d and one farthing (a farthing was a quarter of one penny) (equivalent in total to £98 600) (Fig. 7B) and subscriptions had grown from their initial 171 to >370 (Fig. 7A). The resulting additional work involved with subscription sales, sales of current issues, storage and sales of back issues, reprints, etc. caused the Press to request more reasonable financial recompense. In 1911, it asked for 5% rather than 2.5% commission on sales above 250, and 5% on back issue sales. In view of the large amount of free work done by the Clarendon Press and the extra income generated through their work selling back issues, etc., the Committee agreed (in 1911) to these increased fees and also resolved that the Press should continue to hold the Journal's cash balance with no investment income accruing to the Journal itself. This situation persisted until 1938.

An estimated price for selling a run of back volumes from 1887 to 1908 was £40 (equivalent to £3540), and income from selling back issues was growing. A concentration on keeping the Journal in surplus is reflected in the frugal approach to editorial expenses. In 1898, a mere £15 (equivalent to £1410) was set aside to defray all editorial expenses (secretarial help, postal costs, etc.) while editors paid for their own travel and accommodation to attend the annual meetings. Fortunately, subscriber numbers had grown steadily since the start of the journal, rising by about nine a year on average (Fig. 7A). By 1912, income from subscribers (approx. £600 equivalent to £50 300) was covering average annual production costs, allowing additional income from one-off sales of the Journal, author reprints and back issues to accrue. However, the years 1911–1912 saw a very large if temporary rise in the size of the Journal (Fig. 8A, B), when a substantially increased number of submissions forced the Company to increase the size of two volumes to prevent long delays in publishing accepted manuscripts. This

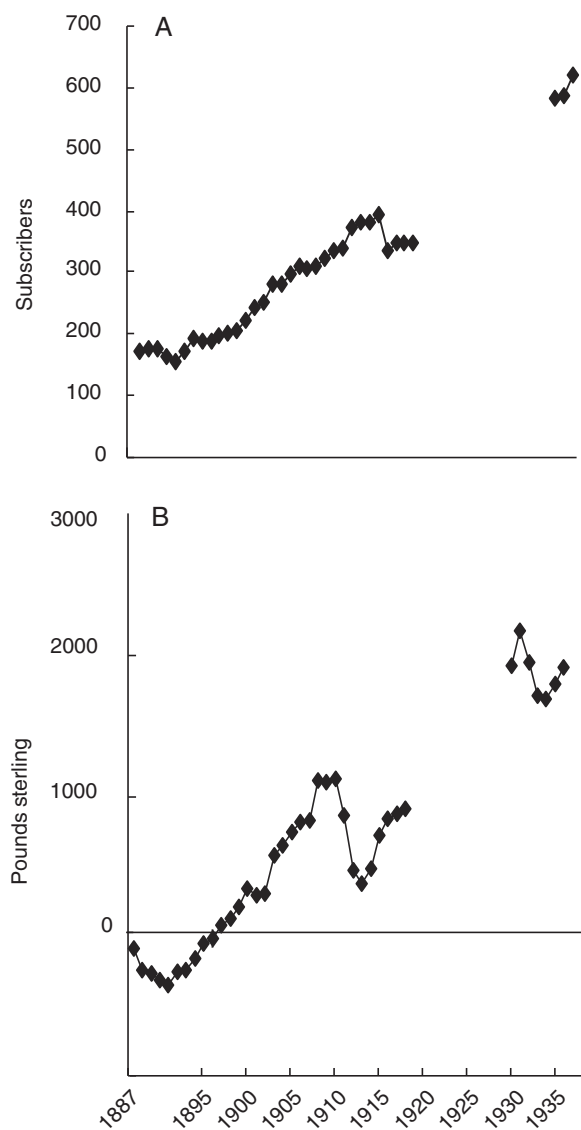


FIG. 7. Subscriptions and accumulation of wealth by the *Annals of Botany* from 1887 to 1936 inclusive. (A) Changes in the number of subscribers to the Journal. (B) Wealth in pounds sterling accrued by the Journal.

increased the total cost of production by approx. 37 %, the extra expense being funded out of reserves. These dipped substantially as a result (Fig. 7B). However, the subscription price was not raised and subscribers still paid only £1:10s for each annual volume of four issues (equivalent to £140). The extra expense for the Company in 1911–1912 was deemed a legitimate call on accumulated reserves and seen as justifiable support for the botanical community in the light of its Articles of Association. This was the beginning of the Journal's custom of supporting botanical science generally from its accumulated wealth. The expensive years of 1911/1912 triggered a search for cheaper ways to print illustrations. At that time, half-tone plates were expensive to produce. Alexandra S. Huth, the Clarendon's 'Scientific, General Chromolithographer and Photo-Engraver' put the cost of a standard run (650 copies) of each full page plate at £6:10s:6d (equivalent to £563).

Design and production During the Balfour years, the external and internal appearance of the Journal changed very little, but there was some fine tuning. A significant early improvement was the inclusion, in May 1890, of authors' institutional addresses. Up until then, this vital information had been omitted, making it very hard for readers to write to authors for a reprint or discuss the content. In 1900, a decision was made to increase revenue by producing a subject index of the contents of the *Annals of Botany* covering the first 10 years (Hill, 1901). This would be sold separately. Surprisingly, facsimile copies are still available, although authorship is wrongly attributed to V. H. Blackman who did not join the Journal until 1921! Cost savings were made by reducing the margins to gain 25 % of printing space and by adopting thinner paper to lower postage costs (1903). However, paper quality was raised only 3 years later to one costing half as much again (7s:6d; equivalent to £34:20) a ream and raised again in 1908 to one costing 10s a ream. In response to foreign competition, the number of free reprints supplied to authors was increased from 25 to 50 (1904), and 2 years later authors' reprints were given covers with printed titles. Also in 1908, margins were widened back to the original size on aesthetic grounds, and a 'Summary of Contents' (Abstract) of each paper became mandatory and was placed at the end of the article. Abstracts were only moved to their now familiar position on the first page of each article in the 1950s. To aid binding, the annual output was divided into two parts. This move was partly a response to a complaint to the Clarendon Press from A. W. Hatchett Jackson at the Radcliffe Science Library, University of Oxford, who bemoaned the poor durability of the large annual volumes. It seems the necessary repairs were giving the library extra expense. These many small adjustments reveal how readily the committee focused on minor issues. There is little evident strategic planning in the Minutes of the annual meetings.

In 1911, many of the plates were produced by collotype (a forerunner of offset lithography) and increasingly by line and half-tone blocks that were inserted in the text rather than collected into whole-page plates to reduce cost. In 1912, Oliver suggested that many figures could be redrawn by the Press to advantage. The practice of re-drawing graphs and similar diagrams to a common format thus became a notable feature of the Journal that remains in place today. A feature of issues of the *Annals of Botany* at around the turn of the century was the inclusion of a high-quality photograph of a famous botanist. For example, there is a fine portrait of Charles Darwin in the front of the first issue of Volume XIII (Darwin, 1899) and one of George Bentham in the first issue of the preceding year (Hooker, 1898). Bentham together with Hooker are known for their widely adopted system of classifying flowering plants (the 'Genera Plantarum') first published around the time the *Annals of Botany* was founded.

1912–1936: the Scott/Seward years

Scott had been Vice-Chairman of the Company since its inception in 1903. In 1912, he replaced Balfour as Chairman and remained in the post until his death in 1934. Although he gave up active editing work in 1912, Scott remained listed as first-named 'Editor' in the front piece of the Journal until 1922

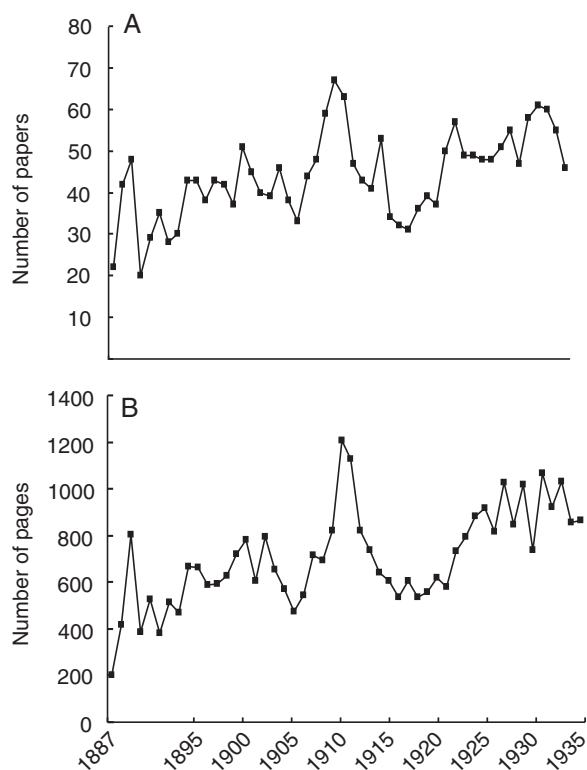


FIG. 8. Changes to the size of the *Annals of Botany* from 1887 to 1936. (A) Number of papers (including 'Notes' which could be less than one page in length) published each year. (B) Number of pages (sides) printed in the Journal each year

even though Farmer was, in effect, the lead editor from 1912. This anomaly of attribution was rectified in 1922 when V. H. Blackman replaced Farmer as lead editor and rightfully became first-named editor in the Journal in place of Scott. Oddly, Scott still remained listed on the front piece as a named editor even though he had relinquished any editing work almost 20 years before! This confusing ambiguity was finally removed when Scott was replaced as Chairman by Albert Charles Seward FRS (Professor of Botany, University of Cambridge) in 1934. For the first time the Chairman of the Company was no longer named at the front of the Journal. Instead, only the active editors who did the day-to-day journal work were shown (at this time Blackman, Eames, Farmer and Oliver). This was the first time a *de facto* editorial board and chief editor were clearly distinguished from the management, although these actual terms were not then in use. The cryptic term 'Other Botanists' was retained on the front piece to refer to the remaining members of the Company and perhaps anyone else who lent a hand. More generally, the Scott/Seward years are notable for weathering the travails of the First World War, currency inflation, the economic depression of the 1920 and 1930s, and for planning a new series of the Journal to start in 1937.

Management After Balfour's departure as Chairman in 1912, the style of management continued much as before, at least at first. Oliver along with Farmer became an active editor. In 1913, Oliver became the first editor to receive submissions directly from authors rather than them being submitted via the

Clarendon Press. The increasing wealth of the Journal enabled the Company to dispense free copies of the Journal to all members of the Company. With the departure of Balfour, the name 'Annals of Botany Ltd' was abandoned in favour of the more correct 'Annals of Botany Company'. The customary fine dining after each annual meeting continued but only for two more years. In June 1914, the last recorded fine dining took the form of a so-called 'informal lunch' at The Trocadero restaurant ('the epitome of grand Edwardian catering'). However, the onset of the First World War, a month later, put an end to such indulgence. During the 4 years of war (and thereafter) there is no mention of extravagant dining out, and the period is characterized by minimal management and extremely brief Minutes, with no traceable Minutes for 1918. During this dismal time, Dyer stepped down as a Company member (in 1917) and was replaced by Sir Arthur William Hill, Deputy Director at Kew (Director from 1922).

The years immediately following the War also lacked much visible managerial enterprise, with the Minutes of annual meetings continuing to amount to less than a page. Gardiner, a founding editor, resigned in 1919 and was replaced by William Henry Lang FRS the first Professor of Cryptogamic Botany at the University of Manchester. At about this time, Balfour was knighted for 'services in connection with the war'. These involved the successful development of sphagnum moss as an antiseptic wound dressing for allied soldiers. By 1921, Vines had left the Company and Farmer, who had been the lead editor since 1912, relinquished the post due to pressure of other work but decided to stay on as a supporting editor and Treasurer. He was replaced by his Imperial College colleague Vernon H. Blackman FRS (Professor of Plant Physiology and Plant Pathology at Imperial College, University of London). The air of depression persisted with the death, in 1922, of Balfour, the Journal's founding father and a coincidental sharp loss of submissions. This was so severe that it delayed the appearance of that year's July issue. Darwin died in 1926 and was replaced by Felix Eugen Fritsch (Professor of Botany, Queen Mary College, University of London and FRS from 1932). The generally short and uninformative Minutes of the late 1920s and early 1930s reveal that although the number of papers published each year was gradually climbing out of its immediate post-war nadir of 31 papers to reach 50 a year by 1923 and 60 by 1934, this upward trend was erratic (Fig. 8). Submissions from America were in short supply (Minutes for 1928, 1929 and 1931) and typically very long and requiring elaborate illustrations (Minutes for 1929), and often of a poor standard (Minutes for 1927). However, some mildly positive things were surfacing. There was talk of reprinting back issues to sustain profitable sales of complete runs of the journal and, by the early 1930s, management had brightened up considerably. In 1931 (and not before time) the Journal started its own (handwritten) Minute Book, and the Minutes of annual meetings grew in length and detail. Also in 1931, plans were made to restart the Journal (after its 50th volume in 1936) with Volume 1 of *Annals of Botany* New Series. By 1934, the Clarendon Press had formally agreed to take on publication of the New Series. With this 5-year forward planning of a revamped *Annals of Botany*, a distinct corner seems to have been turned.

In 1932, Thaxter resigned as Editor for America after 25 years service to the Journal. He was replaced by the equally

eminent Arthur Johnson Eames (Professor of Botany, Cornell University, New York and Vice-president of the American Botanical Society). Eames, a morphologist, would, no doubt, have been expected to help raise the number of contributions from America. These were very small at the time (two papers only in 1932). By 1934, the number had risen to six but, a year later, had fallen back to a single article.

Scott attempted to resign as Chairman in 1932 but was pressed to stay on. He chaired his last meeting in 1933 and died the following year, leaving Bower as the one remaining founder still a Company member. Scott's place on the Committee was taken by the eminent ecologist Arthur George Tansley FRS (Sherardian Professor of Botany, University of Oxford and Sir Arthur from 1950). Tansley had already started two botanical journals (*The New Phytologist* in 1902 and the *Journal of Ecology* in 1917) and was the motivating force behind a 'Manifesto' for revitalizing British botanical teaching and research after the First World War. It was published in 1917 with Oliver and Blackman as co-authors (Blackman *et al.*, 1917). Despite its post-1918 troubles, the *Annals of Botany* management had, by the early 1930s, been strengthened by recruiting some of the most senior and influential UK botanists of the day. The Journal therefore seemed to be in capable if somewhat conservative hands and to have a secure future ahead of it. By 1936, the mildly buoyant mood of the Company is reflected in a decision to allow Members to claim first-class rail fare when attending the annual meeting!

Finance and sales The costs of bumper issues in 1911 and 1912 had depleted the reserves considerably (Fig. 7B) and, by 1913, they had fallen from their maximum of £1140 (equivalent to £98 600) in 1910 to only £382 (equivalent to £31 900). In response, an overly optimistic ceiling of £600 (equivalent to £50 300) was placed on annual production costs. Inevitably, this decision would have been expected to create a backlog of accepted papers and delay publication if submission levels were sustained. However, by 1915, the First World War had changed everything. The numbers of papers and printed pages declined to those reminiscent of the 1890s and only started to pick up again after 1922 (Fig. 6A, B). However, smaller issues did, at least, reduce costs at a time when income too was being hit. Consequently, combined annual expenses charged by the publisher fell from £921 in the financial year 1913/14 to £637 by 1917/1918 at a time when 70 subscriptions were lost, mostly from Germany. The outcome was, unexpectedly, a doubling of accumulated wealth during the war years from a low of £497 in 1914 to £928 by 1918 (Fig. 6B) despite the absence of much in the way of positive management.

In 1920, the Journal raised the annual subscription from £1:10s (equivalent to £51) to £2 (equivalent to £68), an increase of 33%. This was the first increase in 31 years. But, the scant Minutes of annual meetings of the time do not make clear what lay behind the decision. One possibility is the loss of the purchasing power of the British Pound. While retail price inflation had been minimal from 1887 until the outbreak of the War, the rate rose dramatically from 0.62% in 1913 to 21% by 1917 and was 14.14% in 1920 (Officer and Williamson, 2014). Despite the severe currency devaluation, the Clarendon Press managed to keep its production charges to about £1 per printed page throughout the war years. However, this could not last

and, for the financial year 1918/19, the Press raised its charge per printed page by >40%. It was probably this sudden rise in unit production costs that triggered the decision to increase the subscription price.

In the justified mood of post-war austerity, annual editorial expenses were restricted in 1921 to £10 (equivalent to £376) and paid only to the lead editor (Farmer and then Blackman), with no expenses paid to other editors. Similarly, the previously leather-bound volumes would be bound instead with less expensive cloth, while the cost of hiring rooms at The Royal Society was saved by holding the annual meetings at Imperial College, University of London. The pre-war habit of holding annual formal dinners or lunches at expensive London restaurants was seemingly not resumed since no mention is made of these in the relevant if brief Minutes of those times. The absence of official accounts from the Clarendon Press after 1918 makes it impossible to track sales, costs and accumulated wealth in detail. However, it is clear that costs were rising quickly. An example is an increase in the longstanding and extraordinarily small administrative fee from 2 guineas per annum paid to the Clarendon Press. This was raised to 5 guineas (equivalent to £242) at about this time. For the first time since Vines' years, a member of the Company was appointed as treasurer (Farmer), a move probably triggered by the challenging financial times.

By 1926, there were signs of a slowly returning confidence. The Company decided to fund a reprinting of Volume XXXV (1921) to conserve the still saleable complete runs of back issues and, although submissions were still '*...somewhat less than in recent years; . . .*', a few more papers were coming from America. Subscriptions must have been rising overall since, in 1926, the print run of 500 (standard since 1887) was raised to 600 and in 1927 more reprinting of back issues was put in hand. By 1929, the limit on expenses for the lead editor (Blackman) was raised to £40 a year (equivalent to £2060) and there was an isolated charitable donation, 5 guineas (equivalent to £258) being given to The Hooker Memorial Fund towards a memorial to Sir William Jackson Hooker (1785–1865) and Sir Joseph Dalton Hooker (1817–1911) at St Mary's Church, Halesworth, Suffolk. As we have seen, J. D. Hooker was initially critical of the notion of the new botanical journal in the late 1880s but positively influential in suggesting it be 'an Annals'. More general charitable spending was not seen until much later in the century.

The years of the Great Financial Depression (roughly from 1929 to 1932 in the UK) appear not to have dented subscriptions. A letter dated 19 May 1932 from the Clarendon Press reported that although 26 subscription payments were late, there had been '*no actual cancellations*'. In 1932, A. C. Seward commented '*...in a disastrous year like that of 1931–32 [he was referring to the Country's economic problems] we not only escaped a [trading] loss but have been able to show a profit. . .*'. When performance statistics re-emerged in 1930, subscriptions had leapt from 349 in 1918 to 581 (Fig. 7A) while the size of the Journal had grown from 604 printed pages in 1918 to 1016 in 1930 and from 32 articles a year to 55 articles. The rise probably reflects a world-wide economic recovery from the 1914–1918 War and an expansion of university education and state-funded research since there is no evidence of any promotional activity on the part of the publisher or the Company. However, there were also some setbacks. For

example, 20 subscriptions from Russia were cancelled in 1932 (coinciding with the Soviet Famine) and annual losses were made in the years 1932–1934 (Fig. 7A), not only as a result of some large issues and the lost Russian subscriptions, but because of hold ups in payments from Germany. International affairs beyond the control of the Journal thus continued to shape its fortunes throughout the difficult Scott/Seward years.

By 1935, 15 new subscriptions and downward pressures on costs and on the size of issues after some unusually large ones were raising working margins and the Clarendon Press was attempting to increase revenue by trying to sell the last extant complete print run. Subscriptions may also have benefited from the Journal's appeal to plant physiologists. Plant physiology was the fastest growing and increasingly fashionable area of the botanical sciences and, by 1936, dominated the content of the last volume, with 21 out of the 46 papers published that year being physiological. The Journal was now publishing more than ever before the sort of research that the founders, Vines, Darwin and Gardiner especially, would have thought of as their 'New Botany'. Physiology also had the advantage of not requiring so many expensive plates as did more descriptive topics, with graphs being cheaper to reproduce than half-tones. An increasing proportion of the illustrative material from all types of paper was, in any case, being included within the text rather than separated out as half-tone plates which, together with their legends, continued to be awkwardly placed at the end of each paper.

One disappointment was the continued lack of papers from the USA. Only four papers from America were published in 1936 (and only one in 1937). So, despite Balfour's original intention of wooing American botanists to the Journal, *Annals of Botany* had not become a favourite with authors from the North American continent. One possible explanation lies in the establishment, in 1914, of the *American Journal of Botany* and, in 1926, of *Plant Physiology*. By 1936, the *American Journal of Botany* was producing ten issues a year compared with four by the *Annals of Botany* and, all-told, published 108 papers that year compared with 46 in the *Annals*. Furthermore, papers in the newly expanding field of hormones and plant growth regulators were starting to appear in the *American Journal of Botany* but were absent from the *Annals of Botany* (there had been one such paper in the rival British journal *The New Phytologist*). Similarly, *Plant Physiology* was growing fast and, by 1936 and, still only 10 years old, was publishing 67 papers a year, 21 more than the 50-year-old *Annals*. These notably successful American titles were society-based journals and enjoyed a loyal following from their many members and must have attracted numerous papers *Annals of Botany* might otherwise have handled. The *Canadian Journal of Botany*, started in 1929, only added to the intensity of the competition from North America. There is little doubt where the momentum in botanical publishing in the English-speaking world now lay. American subscriptions to the *Annals of Botany* were, however, healthier than submissions. Although few subscriber lists have survived, the last, for 1910, indicates that about 23 % of subscriptions probably originated in the USA. World-wide subscriptions leapt by 35 in 1936 following an international marketing campaign by the Clarendon Press to promote the New Series. Despite some stiff competition, the Journal's finances affairs were clearly on an upward trajectory once again.

Design and production The look of the Journal, inside and out, changed little between 1912 and 1936. Type face, line spacing, margins and layout were almost indistinguishable from 1887 except for having more formalized if non-standard section headings (Introduction, Experimental Procedure, Results, etc.) and a standardized form for the reference list (Harvard system). It is fair to say that, as a consequence, the *Annals of Botany* looked old-fashioned by 1936.

Speed of publication was almost never mentioned in 50 years of annual meetings. In 1926, the Chairman noted that '*It has usually been possible to publish papers within six months of acceptance*', but no indication of how long papers took to be accepted was given. Working to shorten delays in publication and upgrading the presentation and outward image so as to improve the Journal's appeal and competitiveness were clearly not seen as priorities. Roman numerals continued to be used for the volume numbers, which grew increasingly clumsy as the years progressed. [e.g. in 1912 the volume number was XXVI (26) but by 1935 had become XXXIX (49)]. It is, therefore, surprising to see that Roman numerals were also planned for the New Series, starting in 1937 (i.e. Volume I rather than Volume 1). This hardly suggests the New Series would be breaking sufficient new presentational ground to tempt North Americans away from their home-grown journals or appeal strongly to younger scientists looking for a re-vitalized outlet in which to publish their research. This is confirmed by comparing the front piece of the New Series approved by the Company at its 1934 Annual Meeting with that of 1912 or indeed of 1887 (Fig. 9). Management in the 1930s was clearly highly conservative and lacked much of the vision and international awareness characteristic of the original founders. The absence of innovation is perhaps not surprising in view of the high average age of the undoubtedly eminent members of the Annals of Botany Company. In 1936, it comprised two octogenarians (Scott and Bower) and three septuagenarians (the Chairman Seward and editors Oliver and Farmer), with the 57-year-old Fritsch being the youngest member. These late Victorian/Edwardian gentlemen may have had the forethought to conceive the New Series 5 years before but were apparently unable to combine the opportunity this created with the imagination and flair needed to deal effectively with increasingly competitive circumstances. The New Series of *Annals of Botany* would seem much in need of younger managers and editors with the vigour and enterprise required to compete effectively with a proliferation of rival journals. As events turned out, the Journal's managers would also be required to steer the Journal through 5 years of a second World War. Clearly, *Annals of Botany* and its old-fashioned managers and editors, unknowingly perhaps, faced an extremely challenging future.

FORWARD LOOK

Part 1 has summarized the first 50 years of the *Annals of Botany*. Part 2 (in preparation) will deal with the subsequent 75 years. It will recount the pace and extent of managerial and editorial rejuvenation during and after the Second World War. It will also detail how the Journal responded, post-war, to ever-growing competition, to profound changes in the nature of much experimental botany and to a revolution in how

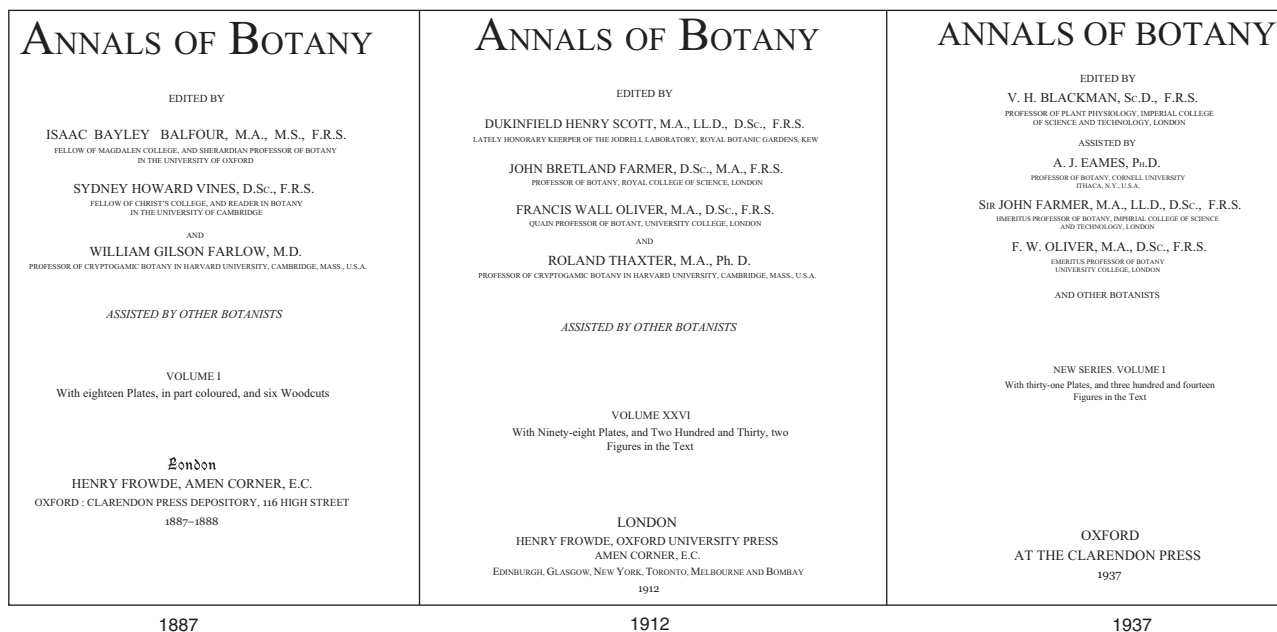


Fig. 9. A comparison of the layout of the front piece of *Annals of Botany* in 1887 (Vol. I), 1912 (Vol. XVI) and 1937 (Vol. I, New Series).

journals were produced and distributed. With parallels to ‘The 1899 Crisis’, a second management crisis again placed the Journal in some turmoil. What triggered the crisis and how it was resolved will also be recounted.

Vines who resigned as an editor at short notice early in 1899 after a bitter falling out between Vines and Dyer (‘The 1899 Crisis’). **Item 9:** a list of Management Committee members and editors appointed between 1887 and 1936.

SUPPLEMENTARY DATA

Supplementary data are available online at www.aob.oxford-journals.org and consist of the following. **Item 1:** invitation, dated October 1886, for botanists to attend the first of five meetings in London to discuss starting a new botanical journal. **Item 2:** handwritten account by S. H. Vines of the second of a series of five meetings and held on 20 January 1887, to discuss the starting of a new botanical journal. **Item 3:** letter dated 20 January 1887 written by Isaac Bayley Balfour and Sydney Vines inviting Oxford University Press to publish a proposed new botanical journal to be named *Journal of Botanical Science*. **Item 4:** entries in the Order Book of the Delegates of Oxford University Press showing their responses to a letter sent by Balfour and Vines (see Item 3) asking the Press to consider publishing their proposed new botanical journal. **Item 5:** final version of the promotional prospectus for the *Annals of Botany* sent out to prospective subscribers by the Clarendon Press in May 1887. **Item 6:** ‘The 1899 Crisis’: letter from Isaac Bayley Balfour (Director of the Royal Botanic Garden, Edinburgh and principle editor of *Annals of Botany*) to Frederick Bower (Regius Professor of Botany, University of Glasgow and a founder member of the editorial committee) dated 9 February 1899. **Item 7:** letter from Isaac Bayley Balfour (Director of the Royal Botanic Garden, Edinburgh and principle editor of *Annals of Botany*) to W. T. Thiselton-Dyer (Director of the Royal Gardens, Kew and a founder member of the editorial committee) dated 12 February 1899. **Item 8:** the Minutes of the 1901 Annual Meeting of *Annals of Botany* paid this fulsome and touching tribute to S. H.

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