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Hugh Bryan Spencer Womersley 1922–2011

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Hugh Bryan Spencer Womersley disliked the word 'seaweed', and objected every time it was spoken in his presence. To him algae were not 'weeds' but beautiful organisms, well worthy of making the subject of a lifetime of scientific study. As was common in the middle of the twentieth century, Womersley did not begin his career as a phycologist, but rather found himself specialising in this life form after discovering how richly represented and little known it was along the coast of southern Australia. In his seventy-year association with the University of Adelaide, Bryan transformed the study of phycology in Australia, attracting a pool of talented students to contribute to his grand project of a marine benthic flora of southern Australia, and to carry the study of algae forward into the next generation. Being a pioneer in the field gave him opportunities for ground-breaking research and an overview of the discipline as it developed, positioning him as the leading expert on Australian algae in the international phycological community.

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Family background

Hugh Bryan Spencer Womersley (always known as Bryan or 'Wom') (Fig. 1),¹ was born on 19 November 1922 at Bristol, England, to Herbert Womersley (1889–1962) and Alice née Spencer (1890–1954). An older brother, John Spencer Womersley, had been born two years earlier.

Bryan's father worked in the British chemical industry, although his passion since childhood had been entomology. Largely selftaught in this discipline, he nonetheless developed significant expertise and was elected a Fellow of the Entomological Society of London in 1926 and an Associate of the Linnean Society of London in 1929. Bryan's mother also maintained a career after marriage, working—as Alice Spencer Womersley—at the *Bristol Times and Mirror*, a leading local newspaper.²

At the age of 41, Herbert was offered employment as an entomologist in the Council for Scientific and Industrial Research (CSIR, later CSIRO) in Western Australia. The family embraced this opportunity for a new life and moved to Perth, arriving on 25 September 1930. Herbert spent the next couple of years investigating two crop pathogens, the Lucerne Flea and the Red-legged Earth Mite. As his contract neared completion, it became clear that it would not be renewed and in 1933, he applied for, and obtained, the position of entomologist at the South Australian Museum in Adelaide. He remained in this post until his retirement in 1959.³

Alice's activities in her first years in Australia are unknown, but once the family were settled in Adelaide she became increasingly prominent in local progressive groups. These included the South Australian League of Women Voters, the Women's Co-operative Guild, and the Women for Canberra Movement.⁴ She also kept her hand in as a journalist acting as Australian correspondent for the



Fig. 1. Hugh Bryan Spencer Womersley (courtesy of the Womersley family).

Co-operative News, the main organ of the English co-operative movement.⁵

Bryan attended Glen Osmond Primary School in Adelaide, and in 1935 he enrolled at Unley High School, one of the first government secondary schools to be established in South Australia. After

¹Kraft (2011) p. 440.

² Anonymous (1944).

³ Southcott (1962).

⁴ Anonymous (1947).

⁵ Anonymous (1948).

three years he sat, and passed, the external examination for his intermediate certificate in six subjects: English literature, Latin, arithmetic (credit), mathematics part 1 (credit), mathematics part 2, physics and chemistry.⁶ In 1938, he studied for his leaving certificate, sitting, and passing English literature, mathematics 1 (credit), mathematics 2, physics (credit), chemistry and botany. He stayed an extra year at Unley, to study for his leaving honours certificate and was named dux of his class at speech day in December 1939.⁷ War broke out while Bryan was at Unley High: he enlisted in the Citizen Military Forces, and served until 1948.⁸

Bryan did not sit his leaving honours exams at Unley, enrolling instead in 1940 at Adelaide High School for another year. This was a recognised strategy for improving examination outcomes. In December 1940, Bryan duly sat, and passed, the leaving honours examination, placing 9 out of 28 students in the general honour list for the state, with credits in mathematics, and botany, and passes in physics and chemistry.⁹ On the strength of this performance he won one of the twelve coveted bursaries awarded by the South Australian Department of Education that provided up to four years free tuition at the University of Adelaide with an allowance of £40 a year.¹⁰

A student at the University of Adelaide

Bryan's long association with the University of Adelaide began in 1941 when he enrolled as an undergraduate in a science degree. His course included a broad range of subjects, although botany emerged as an early favourite and he obtained a credit for it in his first year.¹¹ Under the leadership of Professor J. G. Wood (1900–59), botany at Adelaide had a strong research focus in terrestrial ecology. Bryan described Wood as 'one of the old-style 'God professors'', but added, in recognition of Wood's achievements, 'Perhaps he deserved to be!'¹²

Bryan's brother, John, also started a science degree at the University of Adelaide in 1941, after a stint as a teacher in the South Australian Education Department. Like Bryan, John went on to have a career as a professional botanist, but specialised in land plants rather than the marine vegetation that was to preoccupy Bryan. In 1946, John was appointed a forest botanist in the Provisional Administration of Papua and New Guinea at Lae. He remained in Papua New Guinea for nearly thirty years, retiring as Assistant Director, Division of Botany, Department of Forests.¹³

- ¹⁷ King (1988) p. 2.
- ¹⁸ Woelkerling and Borowitzka (1998) p. 1.

²⁰ Woelkerling and Borowitzka (1998) p. 1. Womersley (1988) p. 3.

Bryan found his vocation on a holiday to Kangaroo Island as a third-year student. An intelligent observer, he realised that he was surrounded by a rich and little-known algal flora and already began thinking about how to make it the basis of a scientific career. He graduated BSc in December 1943,¹⁴ and committed to an honours project with Professor Wood for the following year. His subject was the development and metabolism of copper-deficient oat plants, although he devoted increasing amounts of time to marine algae (Fig. 2).¹⁵

In April 1944, Bryan contacted Valerie May (1916–2007) at the CSIR Division of Fisheries in Sydney,¹⁶ the only dedicated phycologist then working in Australia, and confidently outlined his future plans:

I am studying for my honours B.Sc. this year and am attempting to do some work on the South Aus[ralia]n seaweeds as part of my course. ... I hope to do more intensive collecting around our coasts this year, for I find the algae a most interesting group. What little I have done has convinced me that there are plenty of unrecorded ones to be found just for the looking. ... I propose to publish [a census of Kangaroo Island species] and something of the ecology of parts of the coast (reefs part) in the Royal Soc[iety] of S.A. towards the end of the year.¹⁷

This proved to be an overly ambitious schedule, although in 1945 Bryan won a University Research Scholarship worth £140 to undertake a master's degree project on an intertidal ecological study of the coasts of Kangaroo Island under Wood's supervision.¹⁸ For several years Bryan undertook field work on Kangaroo Island in primitive conditions, renting a house at American River and 'travelling to various parts of the coast on the back of the store-keeper's truck—as he serviced the lighthouses, or as we hired it.¹⁹

Meanwhile, Bryan accepted work as a demonstrator in the Department of Botany. When the letter of appointment arrived, he was somewhat surprised to discover that it was for a lectureship. Believing a feeling of security was essential for productive staff, Professor Wood had worked behind the scenes for Bryan's benefit, and aged only 23, Bryan found himself with a permanent academic position.²⁰

Quick to prove his worth, Bryan produced three research papers in 1946, including the results of his honours research with Wood (Bryan's only non-algal publication),²¹ and two articles in his own right on the marine algae of South Australia.²² In

⁶ Anonymous (1938).

⁷ Anonymous (1939).

⁸NAA: B884, S27320, National Archives of Australia, Canberra.

⁹ Anonymous (1940*a*).

¹⁰ Anonymous (1941*a*). Anonymous (1940*b*).

¹¹ Anonymous (1941*b*).

¹² Womersley (1988) p. 3. Womersley (1960).

¹³ Anonymous (1941*b*). Morley (1985).

¹⁴ Anonymous (1943).

¹⁵ Womersley (1988) p. 3.

¹⁶ King and Briggs (1988).

¹⁹ Womersley (1988) p. 4.

²¹Wood and Womersley (1946).

²² Womersley (1946*a*). Womersley (1946*b*).



Fig. 2. Pennington Bay, Kangaroo Island, February 1946. L to R Ivor Thomas, Claire Simons, Ray Specht, Mary Robinson, Bryan Womersley, Stan Edmonds, Stirling Robertson, Enid Ashby. Photographer Enid Ashby (courtesy of the Womersley family).

framing his first pieces of algal research Bryan outlined a fundamental tension between a taxonomic and an ecological approach. On the one hand he declared that 'scarcely a single species from Australian waters does not require a thorough study, and each genus needs detailed revision', but on the other that 'extensive ecological surveys are needed, for it is such work that brings to light variations in form of many species and indicates how reliable certain taxonomic criteria may be'. Moreover, it was from ecological studies that 'associations of economically important species are likely to be found.'²³ Increasingly, the taxonomic would take precedence over the ecological in Bryan's phycological studies as he was obliged to pick his way through a discontinuous and obscure literature, and scattered type specimens, although he remained alert to identifying the environmental factors that shaped species distribution.²⁴

Teaching at the University of Adelaide

In 1946, the botany staff at Adelaide consisted of Professor Wood, two lecturers, two part-time lecturers and three demonstrators. Wood and Bryan were the only men—at a time when botany schools attracted a relatively high number of women students and junior staff.²⁵ Somewhat provocatively Bryan later commented: 'Perhaps my appointment helped to redress the balance'. He went on to insist that positions at Adelaide had always been made strictly on merit, grandly claiming that 'Neither plants nor botanists have been 'gender specific', seeming to overlook the kind of institutional sexism that concerned his mother.²⁶

The botany course content was broadly based although plant physiology, biochemistry, ecology and taxonomy predominated. Bryan's initial teaching load covered algae to gymnosperms, and plant anatomy. He went on to develop a marine plant course, which together with a companion course in the Zoology Department, 'gave students interested in Marine Biology a basic introduction to this subject.'²⁷

Reflecting on his style as a lecturer he declared:

I've always been a 'chalkie' who prefers large boards where material can remain for some time rather than being whisked on and off an overhead projector. ... Student comments have indicated that I have differed from most lecturers in trying (not always successfully) to get comments and feed-back, by questioning, in smaller (e.g. third year) lectures. This has always seemed preferable to me than routine 'giving forth'—and does keep a class awake, attentive, and hopefully thinking.²⁸

²³ Womersley (1946*a*) p. 127.

²⁴ Kraft (2011) p. 440. Womersley (1988) p. 5.

²⁵ Gillbank (2010) p. 7.

²⁶ Womerslev (1988) p. 3.

²⁷ Womersley (1988) p. 3.

²⁸ Womersley (1988) p. 4.

In regard to evaluation, Bryan favoured giving students feedback during the year, but only formally assessing them at the end of the course, when their knowledge and understanding was at 'the highest level attained'. 'My own assessment', he recalled, 'has always been based on essay-type or short answers ... never multiple choice, since I prefer to give students the chance to express themselves around a topic'.

In 1971, he introduced a summer course in marine plant biology based on his experience of teaching into similar courses at the Friday Harbour Laboratory at the University of Washington, and at the Hopkins Marine Station at Stanford University in the USA. 'The summer courses proved very popular with students,' Bryan recalled, 'and were made available to students from other Universities' who received credit for the courses from their own Universities'.²⁹ A set of detailed course notes survives from Doris Sinkora (1927–2017), curator of algae at the National Herbarium of Victoria, and longtime colleague of Womersley.³⁰

Higher degrees at the University of Adelaide

Before he could supervise postgraduate students, Bryan needed to complete his own higher degrees, which he managed to do alongside receiving regular academic promotions (see Supplementary Material).

In 1947, he graduated MSc with a thesis on the intertidal marine algae of Kangaroo Island. Two papers resulted, both still managing to combine his dual interests in marine algal ecology and taxonomy. The first of these established Kangaroo Island as an excellent locality for the study of environmental influences on the distribution of algal flora as one side of the island was exposed to the Southern Ocean and the other was sheltered by the mainland. Bryan found distinct zonation and distribution patterns in the algae, established in response to variations in wave action, tides, currents, temperatures, light and the chemical composition of the sea.³¹

The following year, he began his PhD studies on the algal community growing on an intertidal reef platform on the south coast of Kangaroo Island. A later student of Bryan's, Gerry Kraft, observed of this project:

This is not the sort of ecology that people would do much of today, since it involved qualitative assessments of species diversity and distributions through space and time that at best may yield correlations but that don't address in any precise and statistically rigorous way the causes. Still, in 1972, some 25 years after the work was done, I revisited his study area armed with his maps and found things virtually exactly as he had described them, so accurate was the documentation and so unchanged the habitat.³²

Marriage

In February 1949 Bryan attended the Pan Pacific Science Congress in Auckland, New Zealand. Also at the conference was Bryan's future wife, Dorothy Alleyne Crawford (always known as Alleyne) (Fig. 3). Born in New Zealand in 1922, Alleyne was the daughter of indent agent Sydney Black Crawford (1882–1963), and Jessie Alice née Brodie (b. 1895), later Mrs G. M. Robertson. Alleyne was educated on the South Island graduating BSc in 1943 from Canterbury University College in Christchurch. After working for the Department of Scientific and Industrial Research (DSIR) in Wellington, she became a demonstrator in botany at Victoria College, and was duly promoted to junior lecturer.³³ In 1946, she graduated MSc from Victoria College.³⁴

Bryan and Alleyne announced their engagement in February 1950,³⁵ and were married at St Johns Church, Wellington, on 15 May 1950.³⁶ The young couple settled in Adelaide, where Alleyne continued working on a fungal project she had begun in New Zealand, and obtained a position as a teacher at St Peter's Girls' Collegiate, an Anglican secondary school.³⁷ Bryan and Alleyne's first child, Robert Spencer Womersley was born in 1954 and a second son, Peter Brodie Womersley was born in 1956.

Study leave 1951–3

In 1951, Bryan took advantage of the University of Adelaide study leave scheme for academics, and applied for funds to travel to the USA, Europe and the UK. 'I applied directly to the Carnegie Corporation on 2 March 1951,' Bryan recalled, 'had a letter of acknowledgement within 10 days, and notification of the Grant-in-Aid by letter of 27 June—within 4 months!'³⁸

International travel was vital to Bryan's research as a taxonomic phycologist. While he was able to collect and examine algal specimens in South Australia, he did not have access to many of the type specimens of already named species because they were mainly held in British and European herbaria. Bryan needed to consult these types before he could draw authoritative conclusions about the correct application of established names to specimens, or about the novelty of specimens.

Alleyne accompanied Bryan on this first overseas trip as his parttime assistant.³⁹ The couple left Adelaide on 1 December 1951, heading first to the USA and Canada where they spent five and half months. Among the highlights was working with leading phycologists Professor G. F. Papenfuss (1903–81) at the University of California, Berkeley, and Professor W. R. Taylor (1895–1990) at the University of Michigan, Ann Arbor.

³² Kraft (2011) p. 440.

- ³⁴ Anonymous (1946).
- ³⁵ Anonymous (1950).

- ³⁷ Anonymous (1951*a*).
- ³⁸ Womersley (1988) p. 3.

²⁹ Womersley (1988) p. 3.

³⁰ RB MSS 339.16, Library Royal Botanic Gardens Victoria, Melbourne. Maroske (2018) p. 34.

³¹ Womersley (1947*a*). Womersley (1948).

³³ Anonymous (1945).

³⁶ Pers. comm. Peter Womersley, 24 September 2018.

³⁹ Anonymous (1951*b*).



Fig. 3. Pan Pacific Science Congress, Auckland, New Zealand, 1949. Bryan Womersley third from left in second back row. Alleyne Crawford far right in front row.

In Ireland, Bryan visited Trinity College, Dublin that held the herbarium of William Henry Harvey (1811–66), rich in types of Australian algae. To make the most of such collections, Bryan and Alleyne took about ten cartons of Bryan's herbarium sheets and a large card index in the back of their hired cars. 'As a result of this trip', Bryan recalled, 'many ADU [Adelaide University Herbarium] specimens are labelled as 'homeotypes', meaning that at the time I considered them identical with the types'.⁴⁰

While assisting Bryan with his research, Alleyne also took the opportunity to examine types of fungal specimens at the Kew Herbarium that related to her research in New Zealand. In 1955, she published 'Studies on New Zealand Clavariaceae: I', under her maiden name in the *Transactions and Proceedings of the Royal Society of New Zealand*.⁴¹ The Roman numeral 'I' in the title suggests that Alleyne intended more parts to follow, but this did not

prove to be the case, as she was drawn more into Bryan's work, and into family life. Like her mother-in-law Alleyne was also a contributor to progressive community groups, and in 2001 she received an Order of Australia Medal for: 'service to women through the Young Women's Christian Association, the National Council of Women of South Australia, and the United Nations Association Australia (SA) Status of Women Committee'.⁴²

The Melbourne herbarium

Although many of Australia's phycological types were in northern hemisphere herbaria the National Herbarium of Victoria also held a substantial collection due to the international contacts of its founder Baron Ferdinand von Mueller (1825–96). In the May term break in 1953, Bryan and Alleyne drove to Melbourne and spent a week at the National Herbarium.

⁴⁰ Womersley (1988) p. 3.

⁴¹ Crawford (1955).

⁴² Commonwealth of Australia Gazette no. S186, 11 June 2001, p. 21.

Bryan soon realised return trips would be necessary, and he cultivated a working relationship with Doris Sinkora, a technical assistant assigned to handle loans of algae. Sinkora collected algae herself and provided Bryan with the eastern-most localities for several species. Shortly before Bryan died he telephoned Sinkora and told her how much he valued her contributions to his work.⁴³

Bryan's final publication was an article written with several collaborators, including Sinkora, on the 'Australian travelling sets' of William Henry Harvey's algal specimens that were lodged at the Herbarium of Trinity College Dublin, and at the National Herbarium of Victoria.⁴⁴

Resources for independent research

Bryan's research trips overseas and interstate were calculated to provide him and his students with resources needed to undertake independent taxonomic studies at Adelaide. The accumulation of homeotypes, and types, was of first importance, and eventually resulted in the herbarium (ADU) amassing over 60,000 algal specimens, regarded by Bryan as 'probably the largest [collection] in the southern hemisphere'. This herbarium is now part of the State Herbarium of the Adelaide Botanic Gardens, an institution that has a statutory responsibility to maintain and safeguard its collections.⁴⁵

Of equal importance to specimens was access to an up-to-date and comprehensive library of phycological literature. The Barr Smith library already held a few of the foundational historic textbooks dealing with Australian algae including W. H. Harvey's *Phycologia Australica*, 1858–63, and J. G. Agardh's *Species genera et ordines algarum*, 1848–80, but Bryan was able to oversee a substantial investment in relevant books and journals.⁴⁶ In 1951, Bryan was pictured in the Adelaide *News*, demonstrating a 'revolutionary US development for making rare texts available cheaply to libraries and research workers.' The development involved reprinting texts on micro-cards that could only be read with a special reading machine, although Bryan found that 'a microscope does the job adequately'.⁴⁷

The third resource that Bryan established to help him with his research was a unique card index that he built up over the years to include all marine algal species recorded for the Australian region, including synonyms, references and type data. As Bryan observed in 1988: 'This has been basic to the Adelaide studies and those of several other phycologists, and still contains notes on new species and combinations which I have not as yet published'.⁴⁸ The index was donated to the Adelaide Botanic Garden and State Herbarium in 1992.

Finally, Bryan was able to acquire funds to establish a dedicated phycological laboratory. This included algal culture facilities in which he grew organisms in various life stages. For two decades (1967–87), Bryan obtained funding, largely from the Australian Research Council, to employ Enid Lucy Robertson née Ashby (1925–2016), as a research assistant, and manager of his herbarium and technical assistants. Elizabeth M. Gordon-Mills, who completed a doctorate with Bryan in 1969, wrote of Enid: 'She was actively involved in the taxonomic work which lay behind many of the publications produced from this [Bryan's] laboratory'. Enid was also responsible in her own right for the treatment on seagrasses in the first volume of *Marine Benthic Flora of Southern Australia.*⁴⁹

Having invested so much time and effort in building up research facilities, Bryan found himself increasingly disinclined to move to any other institution where he would 'have to start again, almost from scratch'.⁵⁰ He made use of travel grants to visit overseas algal centres (see Supplementary Material), but the attractions of a well-resourced, stable, home base were strong. As former student, Gerry Kraft, commented, Bryan's herbarium, library and laboratory created 'a cynosure for active, creative, stimulating and lasting work'.⁵¹

The benthic flora of southern Australia

When Bryan started work on algae, systematic treatments of this group for Australia were hopelessly 'out-of-date' due to the discovery of numerous new species, and major changes to the arrangement of higher classification.⁵² Bryan decided to remedy the deficiency, and produce a series of taxonomic volumes on the benthic (under-water) plants of southern Australia; in effect creating the resource that he did not have to hand in his early ecological research.

In botany, floras are principally regarded as aids to identification, with the author(s) compiling information from already existing monographic revisions of families and genera, and adding keys and illustrations. As monographic revisions were also lacking in Australia, Bryan had to begin his flora project by working them up himself, and/ or recruiting colleagues and students to do so. Between 1963 and 1988, he supervised more than thirty honours, masters and doctoral students at Adelaide, most of whom produced monographic revisions cited in his flora (see Supplementary Material).

Given the long lead-time required to publish a flora, Bryan exhibited a remarkable steadfastness toward his project. Arguably being meticulous and single-minded were necessary traits to complete such a large-scale work, but he faced challenges along the way. As new workers entered the field in Australia, with their own students, they developed different kinds of algal projects. Bryan also had to accommodate new techniques, such as SCUBA diving to obtain specimens, the use of numerical taxonomy, cladistics, and toward the end of his career, DNA sampling.

⁵⁰ Womersley (1988) p. 4.

⁴³ Sara Maroske interviews with Doris Sinkora, Library, Royal Botanic Gardens Victoria.

⁴⁴ Parnell and others (2010).

⁴⁵ Womersley (1988) p. 5.

⁴⁶ Womersley (1988) p. 5.

⁴⁷ Anonymous (1951*c*).

⁴⁸ Womersley (1988) p. 4.

⁴⁹ Gordon-Mills (1988).

⁵¹ Kraft (2011) p. 440.

⁵² Womersley (1984) preface.

Postgraduate students

Bryan's first postgraduate student was E. Ann Shepley (later Mrs F. J. Mitchell), who graduated MA in 1955 with a thesis titled 'Morphology and taxonomy of the Sarcomeniodeae', a new subfamily of red algae. Bryan and Ann went on to co-publish four papers on red algae, research that Bryan drew on for the treatment of Sarcomeniaceae (now recognised as a family) in Part IIID of the *Marine Benthic Flora of Southern Australia* (see Supplementary Material).

As Bryan's reputation for research on marine algae grew, he attracted increasing numbers of MA and PhD students from Australia and around the world, including Pakistan, the UK, USA, New Zealand and Myanmar) (Supplementary Material). 'I have always been glad', Bryan reflected at his retirement, 'that more than half of my Ph.D. students came from other countries'.⁵³ Several these students went on to take up phycological appointments, or establish phycology as a discipline in universities across Australasia including Elise M. Wollaston (c. 1922–2012) at the University of Adelaide, William J. Woelkerling at Latrobe University, Melbourne, Victoria, Gerald T. Kraft at the University of Melbourne, and Murray Jury Parsons (1941–2011) at the Allan Herbarium, Department of Scientific and Industrial Research, New Zealand.

Seeking and accepting Bryan as a supervisor was no sinecure. Before leaving the USA for Adelaide in 1970, Gerry Kraft asked Bill Woelkerling (who had recently completed a PhD with Bryan) what to expect of his new supervisor.

Well [said Bill], he [Bryan] really has but two non-family preoccupations, the first and foremost being the marine-algal studies for which he and his students are noted, the second—albeit minor being local politics. As a supervisor he'll show a keen interest in what you have found. He will not, however, devote a lot of time to hearing excuses when you haven't found anything.

Gerry found Bill's assessment to be 'pretty accurate'.54

A total of thirty four students completed honours, MSc or PhD theses with Bryan, and he prided himself on doing everything possible and reasonable to ensure their success. It rankled when 'some students, often very good ones,' failed to submit a thesis. In 1988, Bryan acknowledged that there had been 'two such students in recent years, both of whom are doing well in their changed careers' and thought it very likely they would regret their decisions in the future. A stickler for fulfilling promises and duties, Bryan added that 'such students have at least a moral obligation to repay the scholarship they were given—perhaps in this age of restricted University finances, this should be a legal obligation'.⁵⁵

The vast scale of a floristic project such as the *Marine Benthic Flora of Southern Australia* almost ensured that Bryan fostered ongoing working relationships with students. Elise M. Wollaston

- ⁶⁰ Womersley and Bailey (1969) p. 441.
- ⁶¹ Womersley and Bailey (1970).

(c. 1922–2012) is notable in this regard. In 1966, she completed her PhD supervised by Bryan on red algae—'Morphology and taxonomy of southern Australian genera of Crouanieae Schmitz (Ceramiaceae, Rhodophyta)'.⁵⁶ Bryan included these groups in Pt IIIC of *Marine Benthic Flora of Southern Australia*. Bryan also turned to Elise as a co-author on a successful application to the Australian Research Grants Committee in 1971. These funds built on an earlier ARGC grant that Bryan had obtained in his own right in 1968, the two grants together allowing him to make a sustained effort toward realising his phycological flora.⁵⁷

Royal Society of London Expedition to the British Solomon Islands Protectorate

While there were more than enough algae in the southern waters of Australia to satisfy many phycological careers, in 1965 Bryan took up an opportunity to join an expedition organised by the Royal Society of London to the Solomon Islands in the south-west Pacific. It was the largest and logistically most complex expedition organised by the Expeditions Department of the Royal Society.⁵⁸ Led by Edred John Henry Corner (1906–96), the expedition visited the Solomons from July to December, with a team of scientists. Bryan was part of the marine party that used a small ship as a base. The main aim of the expedition was to survey a hitherto little-known biota that was attracting increasing commercial interest due to its timber resources. The scientists also thought that the Solomons might provide 'a key to questions of biological distribution patterns between South-east Asia and Australasia'.⁵⁹

The following year a meeting was held at the Royal Society of London where scientists presented and discussed a series of papers. Bryan attended and presented an account of the marine algal biogeography and ecology of the algae and seagrasses. Bryan stressed that, as he had found in South Australia, 'a great deal more taxonomic work' needed to be done in the Solomons before any reliable progress could be made in biogeography and ecology.⁶⁰ To this end, he and Allan Bailey published a monograph on the marine algae of the Solomon Islands in 1970.⁶¹ South African born phycologist, and a president of the International Phycological Society, George Frederik Papenfuss (1903–81) regarded this monograph as 'a model of its kind.'⁶²

Society memberships

There were no phycological societies when Bryan began his career, but as they emerged he joined several, and was an active participant in their governance, conferences and publications. The International Seaweed Association (ISA) was inaugurated in 1952 and Bryan attend its first triennial symposium at Edinburgh in the UK.

⁶² Letter, 12 November 1974, G. F. Papenfuss, Berkeley, California, USA to L. T. Evans, Division of Plant Industry, CSIRO, Canberra—Womersley nomination documents, Archives, Australian Academy of Science, Canberra.

⁵³ Womersley (1988) p. 5.

⁵⁴ Kraft (2011) p. 439.

⁵⁵ Womersley (1988) p. 4.

⁵⁶ Wollaston (1988).

⁵⁷ Womersley (1988) p. 3.

⁵⁸ Hemmen (2010) p. S91.

⁵⁹ Hemmen (2010) p. S92.

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Fig. 4. Board of the Botanic Garden and State Herbarium, 1978. Left to right back row: Noel Lothian, John Cornwall, Walter Bridgland, Bryan Womersley, Brian Morley. Left to right front row: John Pedler, Jennifer Adamson, Don Scott-Young, Enid Robertson, Dean Berry. Photographer E. Robertson (courtesy of the Womersley family).

He also attended the seventh symposium at Sapporo, Japan in 1971, the eighth at Bangor, UK in 1974, and the ninth at Santa Barbara, USA in 1977. The International Phycological Society (IPS) was founded in 1960. Bryan served as president in 1970 and published in the society's journal, *Phycologia*.

As the number of Australian phycologists began to increase, there was interest among them in forming a local society. Bryan hosted a meeting in Adelaide in 1979 to discuss a way forward. The Australasian Society for Phycology and Aquatic Botany (ASPAB) was launched in 1980 with Bryan as inaugural president. The *ASPAB Newsletter* became a vital resource for sharing the latest information on Australian phycology and phycologists, and also recorded reminiscences and biographical information. Bryan's own reflections on his career appeared on his retirement in 1988.⁶³

Administrative service

During Bryan's career at the University of Adelaide, academics were expected to contribute to the administration of the university and related institutions, although this was regarded as a secondary duty next to teaching and research.⁶⁴ There had always been close links between the Department of Botany and the Adelaide Botanic Gardens, and in 1958 Bryan was appointed the university member of the Herbarium Liaison Committee, and in 1961 he was appointed to the Board of the Botanic Gardens. 'At the time of the appointment', Bryan later recalled, 'I was less than half the age of the Chairman and 27 years younger than the average age of the Board' (Fig. 4).⁶⁵

In 1964, Bryan was appointed honorary curator on the Sites and Grounds Committee of the University of Adelaide by the university council. His letter of appointment described his responsibilities as determining 'the planting and care of the plants in the University grounds'. Working with Doug Ryan, the foreman-gardener, Bryan derived 'much pleasure in helping to develop a pleasant campus'. His innovations included the 'Botany Garden', north of the Benham Building and a waterfall based on a 'water wall' he had seen in Japan.⁶⁶

⁶³ The ASPAB Newsletter published an edited version of Womersley's reminiscences. A complete unpublished copy is held in the archives at the Australian Academy of Science, Canberra. Womersley (1988).

⁶⁴ Womersley (1987) 'Reminiscences', p. 4, Archives, Australian Academy of Science, Canberra.

⁶⁵ Womersley (1987) 'Reminiscences', pp. 17–18, Archives, Australian Academy of Science, Canberra.

⁶⁶ Womersley (1987) 'Reminiscences', p. 15, Archives, Australian Academy of Science, Canberra.

Bryan's third major administrative contribution was his involvement with oversight of the South Australian marine environment. This began in 1973 when he was appointed to the Spencer Gulf Water Pollution Co-ordinating Committee. This committee was involved in preliminary environmental studies for the Redcliff Petrochemical Development. In 1977, he became a member of a successor committee—the South Australian Marine Environment Advisory Committee. Bryan attended regular monthly meetings up to March 1986, but after that date no further meetings were called. Despite his writing two letters of concern to the minister for environment about the committee, it remained in abeyance and Bryan resigned. He later reflected: 'It is sad to see such a potentially useful (though poorly serviced) committee finish this way'.⁶⁷

Marine Benthic Flora of Southern Australia

Part I of the Marine Benthic Flora of Southern Australia, dealing with the green algae (Chlorophyta) and seagrasses was published on 31 May 1984, close to forty years after Bryan had first lamented the state of Australian phycological taxonomy.⁶⁸ It was a plain volume of 329 pages, densely packed with descriptions of ~2,000 species accompanied by fine technical drawings (executed by technical assistants), and black and white photographic plates. E. L. Robertson contributed the chapter on seagrasses, and C. van den Hoek collaborated on the treatment of the genus Cladophora. The volume was issued under the imprimatur of the government Committee for Handbooks of the Flora and Fauna of South Australia (later volumes were co-published by the Flora of Australia project in Canberra). Bryan wrote modestly about his achievement in a preface-'This Flora is but a further stage in our knowledge of marine plants of the phyla concerned', adding with some understatement—'Much remains to be done'.⁶⁹

Part II of Bryan's flora, dealing with the brown algae and the genus *Vaucheria* of the Chrysophyta (unicellular marine or freshwater algae) appeared in 1987.⁷⁰ Bryan collaborated with S. Skinner on the Myrionemataceae and Leathersiaceae, with A. Bailey on the Chordariaceae and with L. A. Scott on the subgenus *Sargassum*. The red algae were dealt with in Part III, issued in four volumes between 1994 and 2003.⁷¹ His collaborators in these volumes included K. S. Edyvane, M. D. Guiry, J. M. Huisman, G. T. Kraft, J. A. Lewis, W. J. Woelkerling, A. S. Harvey, D. L. Penrose, H. W. Johansen, E. M. Wollaston, M. J. Parsons,

R. Baldock, J. Huisman, L. Phillips and S. Wilson. In all, this encyclopaedic work comprised six volumes, 2781 pages, 36 colour plates and 1059 black-and-white photograph and drawing plates.

Each volume was reviewed in international journals, with several novel and valuable features in Bryan's work being highlighted.⁷² Several reviewers noted that the *Marine Benthic Flora of Southern Australia* was the first series to tackle a large geographical area of the continent since Harvey's *Phycologia Australica* (1858–63).⁷³ Dutch botanist and phycologist Cornelius Den Hartog went so far as to claim that Bryan's volumes in fact constituted the first ever work to qualify as an algal flora in the sense that it is 'as complete as possible, of all species of a certain area', arranged 'according to the prevailing taxonomical classification', provides 'species descriptions and keys', and short introductions about the 'physiographic features of the area involved, plant ecology (plant communities, master factors, etc.) and plant geography'.⁷⁴

The comprehensiveness of the contents led several reviewers to designate the *Marine Benthic Flora of Southern Australia* as a model and fundamental work.⁷⁵ Bill Woelkerling called the series 'the most scholarly and comprehensive work on southern Australian marine plants ever published and, on a world scale, ranks amongst the best algal floras ever produced'.⁷⁶ 'How many among us', asked Max Hommersand somewhat enviously, 'have identified a significant problem at the beginning of our scientific career, followed the trail unwaveringly, and seen it through to the completion in the course of a lifetime?'⁷⁷ Hartog complained that Bryan was making things too easy for students. 'In fact', he declared, 'the new generation of phycologists gets handed on a plate the results of a life time of persevering research'.⁷⁸

Bryan's work was also credited for drawing attention to the 'extreme richness of the flora of the coastline of southern Australia'.⁷⁹ The red algae were especially notable in this regard and Max Hommersand thought their diversity and numbers were 'unequalled anywhere in the world.'⁸⁰ Hommersand calculated that the *Marine Benthic Flora of Southern Australia* covered 460 genera and 1,137 species, a significant number of which were novel taxa and endemic to Australian waters.⁸¹

For the most part Bryan's approach to the systematic arrangement of groups was regarded as conservative.⁸² As Kraft observes, Bryan was a 'classical' or ' α ' taxonomist in the sense that his main

⁷⁹ Wynne (1988) p. 432.

⁶⁷ Womersley (1987) 'Reminiscences', p. 18, Archives, Australian Academy of Science, Canberra.

⁶⁸ Womersley (1946*a*) p. 127.

⁶⁹ Womersley (1984).

⁷⁰ Womersley (1987).

⁷¹ Womersley (1994). Womersley (1996). Womersley (1998). Womersley (2003).

⁷² Lawson (1985). Hartog (1985). Dixon (1985). Wynne (1988). Hartog (1989). Hommersand (1995). Brodie (1995). Gabrielson (1997). Chamberlain and Brodie (1998). Hommersand (1999). Brodie (2000). Woelkerling (2003). Hommersand (2003).

⁷³ Lawson (1985) p. 399. Hommersand (2003) p. 1001.

⁷⁴ Hartog (1989).

⁷⁵ Wynne (1988) p. 443.

⁷⁶ Woelkerling (2003) p. 448.

⁷⁷ Hommersand (2003) p. 1001.

⁷⁸ Hartog (1989).

⁸⁰ Hommersand (1995). Hommersand (1999) p. 251.

⁸¹ Hommersand (2003) p. 1001.

⁸² Wynne (1988) p. 342. Dixon (1985) p. 120.



Fig. 5. Trophy table, Bryan Womersley's 80th birthday, 2002 (courtesy of the Womersley family).

research involved finding, describing and naming taxa based on morphological (especially reproductive) characters.⁸³ The exception to this rule was Bryan's classification of the red algae and Hommersand claimed that his treatment of this group 'contains insights that will influence the course of red algal systematics far into the future'.⁸⁴ A comparison between Bryan's first publication on red algae in 1947, and the volumes on the reds in Marine Benthic Flora of Southern Australia, reveal how much his knowledge of this group expanded over his career.85 By the time the final volume of the flora was issued, however, new techniques using electron microscopy and molecular phylogenetics were being taken up in algal taxonomy,⁸⁶ and Hommersand admitted that more systematic changes were inevitable. 'As we now know', he wrote in his review of Pt IIID, 'the southern Australian flora contains many of the groups of green, brown and red algae that are currently understood to occupy basal positions in molecular phylogenetic analyses.⁸⁷

Honours and awards

Bryan's career as a student and academic was regularly punctuated by honours and awards for his achievements. His first award was Dux of Unley High School in 1939, and he was honoured with medals from the Royal Societies of New South Wales and South Australia and the Australian and New Zealand Association for the Advancement of Science. In 1999, the *Marine Benthic Flora of Southern Australia* won the Prescott Award of the Phycological Society of America (see Supplementary Material and Fig. 5).

Most of Bryan's honours and awards came from organisations and societies that had a tradition, or preference, for recognising contributions in the so-called 'classical' botanical subdiscipline of taxonomy. Among practitioners of newer botanical subdisciplines, such as Professor John Stewart Turner (1908–91) at the University of Melbourne and Professor Peter Martin (1923–94) at the University of Adelaide, there was a perception that taxonomy was too close to natural history to be regarded as a modern science, and consequently that it was unlikely to attract funding and/or recognition from the major scientific bodies. Turner shifted the focus of the School of Botany at the University of Melbourne to experimental and laboratory-based physiological botany, and ecology,⁸⁸ and Martin was preoccupied with angiosperm molecular phylogeny.⁸⁹

Bryan spoke of himself as a 'comparative morphologist' rather than a taxonomist, but most of his publications were undoubtedly taxonomic.⁹⁰ He rigorously defended the kind of research that he published and argued that it was fundamental to the successful

⁸³ Kraft (2011).

⁸⁴ Hommersand (1995) p. 251.

⁸⁵ Womersley (1947b).

⁸⁶ Huismann and Kraft (2007) p. 220.

⁸⁷ Hommersand (2003) p. 1001.

⁸⁸ Gillbank (2014). Ducker (1978). Sophie Ducker, personal communication, 12 May 2003 (record of conversation with Sara Maroske).

⁸⁹ 'Peter Martin (1923–1994)', https://www.adelaide.edu.au/library/special/mss/martin/, viewed 5 February 2019. Email, 1 February 2019, Bill Barker, Department of Environment and Water, Adelaide, South Australia to Sara Maroske.

⁹⁰ Email, 1 February 2019, Bill Barker, Department of Environment and Water, Adelaide, South Australia to Sara Maroske.



Fig. 6. Bryan Womersley c. 1990s (courtesy of the Womersley family).

practice of other botanical disciplines and to ecology. Moreover, he saw his descriptions of new taxa as hypotheses that were to be tested and accepted or revised by other taxonomists, consistent with his notion of the 'scientific method'.⁹¹

These differing views on the status of taxonomy are important to understanding the context of Bryan's nomination to the fellowship of the Australian Academy of Science (AAS). In Australia, this fellowship is the highest form of recognition that scientists can receive from their peers. In 1974, Bryan was nominated by two existing fellows: Professor Rutherford Ness Robertson (1913-2001), a botanist and president of the AAS, and David Guthrie Catcheside (1907-94) a geneticist. References were also sought and provided by British biologist Gordon Elliott Fogg (1919-2005), British botanist and mycologist Edred John Henry Corner, American biologist Lawrence Rogers Blinks (1900-89), South African/American phycologist George Frederik Papenfuss, and British marine botanist Mary Winifred Parke (1908-89). Most of these scientists acknowledged that taxonomists tended to be underappreciated, but argued that the subdiscipline was nonetheless very important and that its practitioners deserved membership in academies of science. Blinks, for example, lamented that there were very few taxonomists in the National Academy of Sciences in the United States of America.92 Fogg added, 'taxonomy needs encouraging these days'.93

Bryan was duly elected in 1977, becoming the first scientist whose main work was taxonomy and/or phycology to be elected to the AAS. Nevertheless, the citation that he provided to the academy began with his work on comparative morphology, and on 'relation-ships within the groups', with taxonomy coming in third. Only a couple of previously elected fellows also had taxonomy in their citations, both elected in 1954. The first was Douglas Frew Waterhouse (1916–2000), an insect physiologist who made 'valuable contributions to the taxonomy of the Australian blow-fly'.⁹⁴ The second was Ian Murray Mackerras (1898–1980), medical and veterinary entomologist, and parasitologist who added 'much to the knowledge' of the taxonomy of the insect vectors of dengue fever and malaria.⁹⁵

Conclusion

Hugh Bryan Spencer Womersley had every reason to be satisfied with his life and career. Former student, Gerry Kraft, recalled a story about Bryan at the time of his death that encapsulated the depth of Bryan's contentment (Fig. 6). After a day of collecting at Portland, Victoria, Bryan and his students repaired to a pub where local fishermen and abalone divers were also to be found. 'At one point', Kraft related, '[an] abalone diver turned to Wom and pointedly asked 'What sort of a man is it who spends his working life looking at seaweed?'' For once Bryan let the misuse of 'seaweed' go by, and

⁹¹ Womersley (1984) p. 7. Woelkerling and Borowitzka (1998) pp. 2–3.

⁹² Letter, c. 1974, L. R. Blinks, Stanford University, California, USA to L. T. Evans, Division of Plant Industry, CSIRO, Canberra, Australia—Womersley nomination documents, Archives, Australian Academy of Science, Canberra.

⁹³ Letter, 18 November 1975, G. E. Fogg, Department of Marine Biology, Marine Science Laboratories, Anglesey, UK to Prof. R. O. Slatyer, Department of Environmental Biology, ANU, Canberra—Womersley nomination documents, Archives, Australian Academy of Science, Canberra.

⁹⁴ 'Douglas Frew Waterhouse', https://www.science.org.au/fellowship/fellows/dr-douglas-frew-waterhouse, viewed 19 January 2019.

^{95 &#}x27;Ian Murray Mackerras', https://www.science.org.au/fellowship/fellows/professor-ian-murray-mackerras, viewed 19 January 2019.

'patiently and with panache' launched into an eloquent defence of his life and work:

I have travelled to every continent bar Antarctica. In every place where people also study plants of the sea I have acquaintances who know well who I am, what I do, and who offer me hospitality. When I visit the library of any big university in the world I can go to the shelves and take down publications that have my name on them, and those articles are about things I have discovered and named myself. I have a lovely wife, two wonderful sons and a house with a tennis court in Netherby. And I owe it all to seaweed.

According to Kraft, the abalone diver looked at Bryan thoughtfully for a second and replied: 'You've answered me well'.⁹⁶

Little was known about Australia's southern marine plants when Bryan began his career as a botanist, and this lack, and the realisation that southern Australian algae were both very rich in endemic species, and diverse in their higher taxa, led him to become a phycologist. His major work, the *Marine Benthic Flora of Southern Australia*, took sixty years to complete and the help of over thirty colleagues and students whom he persuaded to take up taxonomic projects. The high standard of the flora and its internal consistency won him much praise and established his reputation internationally as Australia's leading phycologist.

Bryan left his chosen field of study richer than he found it and with several his students holding key academic positions at Australian universities. There is currently no dedicated staff phycologist at Bryan's institutional home, but the phycological laboratory is still active. Bryan was also responsible for the establishment of the H. B. S. Womersley Chair in Plant Systematics at the University of Adelaide, and Michelle Waycott is the current incumbent. The Australasian Society for Phycology and Aquatic Botany also remains as one of Bryan's major legacies, a body that promotes, develops and assists in the study of macro- and micro-algae and aquatic botany within Australasia and elsewhere.

Conflicts of interest

The author declares no conflicts of interest.

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