

John Frederick Adrian Sprent 1915–2010

Chris Bryant^{A,E}, Ian Beveridge^B, Malcolm Jones^C and Hugh I. Jones^D

^ACentre for the Public Awareness of Science, Australian National University, Canberra, ACT 0200, Australia.

^BFaculty of Veterinary Science, University of Melbourne, Vic. 3010, Australia.

^CSchool of Veterinary Sciences, University of Queensland, St Lucia, Qld 4072, Australia.

^DThe Marshall Centre, University of Western Australia, Crawley, WA 6009, Australia.

^ECorresponding author. Email: chris.bryant@anu.edu.au

John Frederick Adrian Sprent was the outstanding figure in Parasitology in Australia in the twentieth century. He established and held the Chair of the Department of Parasitology at the University of Queensland from 1956 to 1983. He was internationally recognized by parasitologists, both for his work on ascaridoid nematodes and for his huge contribution as Editor-in-Chief of the *International Journal for Parasitology* from 1974 to 1993.

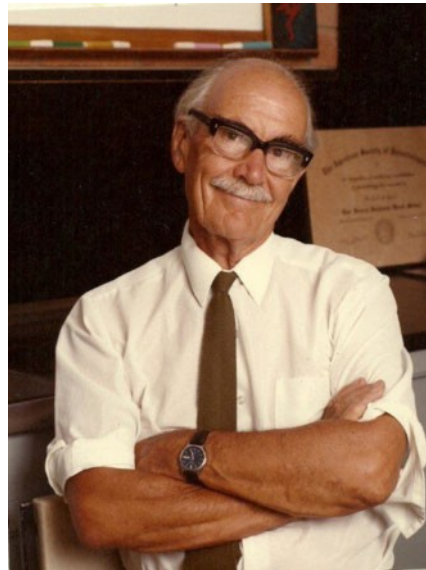
Preamble

John Frederick Adrian Sprent was undoubtedly the outstanding parasitologist in Australia in the second half of the twentieth century. He made many valuable contributions to education, research and scholarship within the discipline of Parasitology. A trained veterinarian, his early work was firmly based in classical zoology and continued so up to the start of the revolution in cell biology and genetics. He is recognized both nationally and internationally for his achievements.

In September 2010, a small group of family, colleagues and friends of John Sprent gathered in a small meeting room in an aged-care facility in Springwood, south of Brisbane. The group had gathered to celebrate with John his award of a Distinguished Achievement Award by the World Federation of Parasitologists at the International Congress of Parasitology held in Melbourne the previous month. This Congress was the first in which the award had been made. John, an inaugural member, Past President and Fellow of the Australian Society for Parasitology (ASP), a Fellow of the Australian Academy of Science since 1964 and a Commander of the Order of the British Empire (CBE) since 1984, was a clear choice of the Federation for this award. The journey had taken almost a century.

Early Years

John Sprent was born in Mill Hill, in Middlesex in England, on 23 July 1915 and died in



Brisbane on 1 November 2010. Although Mill Hill was a mere 14 km from Charing Cross, it was then a country village firmly embedded in the London Green Belt and considered by the gentry at that time to be the ideal country retreat. One of the authors (Chris Bryant) remembers Mill Hill even thirty years later as being ‘out in the country’ with easy access to farms, woods and streams for picnics and school field studies. John’s parents separated soon after his birth, however, and he subsequently moved to Sussex with his mother. He later described a typical English country boyhood for those days,

including collecting tadpoles and nurturing them into frogs. At the seaside, he would procure a fish-head from the local fish-shop for use as bait on the end of a piece of string. In the deeper water it would attract beautiful crabs. These childish experiments provided his first experiences of animals.

His father, who died in 1931, was Frederick Puller Sprent and was a keeper of ancient maps at the British Museum, in London. His mother, Violet Agnes Sprent (née Clay), lived to be 101. He had one brother and one sister. His father paid for his education at Shrewsbury School, now co-educational but at that time one of the best all-boys public schools in England. Founded in 1552, its alumni list reads like a roll call of the English upper-middle class and counted Charles Darwin among its numbers. To be an Old Salopian conferred a certain class status between the Wars, when John was a pupil. This was to create for him an unusual opportunity at a crucial stage in his intellectual development.

John did not consider himself to be a good student. In fact he considered that he was a great disappointment to his father who sacrificed a lot to pay the school fees. He was usually close to the bottom of the class but this did not affect his enjoyment of school as he was good at sport and made many friends (Campbell, 2008). His son Jonathan (himself an eminent scientist) describes a mischievous streak in his father:

In fact he took a delight in pointing out how hopeless he was at everything he did, until he was rescued by my mother after he had dropped out of school when his father died. He used to boast in reverse about his academic career at school, how he competed with a school friend to be bottom of his class, again to the hilarity of adults but most confusing to his young children! (Jonathan Sprent, personal communication)

With his father's death during the Great Depression, the source of John's funding dried up. It appears that he had managed to scrape sufficient qualifications at Shrewsbury to matriculate by the time he had to leave to find a job. There was, however, little chance of a university place, because for those who did not gain scholarships the cost of a university education was prohibitive.

John became an office-boy with WD & HO Wills, the cigarette manufacturer, consigned to menial tasks such as inserting invoices into

windowed envelopes so that the address was visible. Obviously this was a job that engaged neither his heart nor his mind as, he reports, many were 'returned to sender' unopened. He did, however, make some good friends, and one particularly good one whose name unfortunately is not recorded.

The literature of the time contains many stories of benefactors of young, promising working class lads. John was certainly not working class but his great opportunity might have been scripted by A. J. Cronin. At this low point in his career, John was at a loss about what to do, lacking both funds and motivation. Then, one day, strolling across Hungerford Bridge with this very good friend, they stopped and leaned on the parapet to watch the traffic on the Thames. The friend told him that he had always wanted to go to university and, at a time when class distinction was rife in England, lamented that he did not have the right connections. He went on to say that he thought John did have the social credentials and asked him whether he would permit him to pay for his first year at university. John was overwhelmed because, although his parents and Shrewsbury had given him the appropriate social cachet, he felt his qualifications were not particularly good. He consulted his family and there occurred one of those discussions during which an important decision is made almost light-heartedly and without much apparent thought for the consequence:

My mother was particularly keen on dogs and cats and animals of all kinds—guinea pigs, goodness knows what, you name it, she had 'em—and during the Depression she used to have boarding kennels. And she said, 'Why don't you become a vet?' I thought about that, and I thought, 'Why not?' (John Sprent, quoted in [Campbell, 2008])

It was at about this time that John met someone who had a great influence on his life: his first wife, Muriel Florence Hines, to whom he was married for 61 years. They met when he was mis-stuffing envelopes and she was a telephone operator. They quickly formed a strong attachment that survived a necessary separation when John went to Liverpool to study Veterinary Science. Muriel stayed in London and continued to work. She was very enthusiastic about his studies and spurred him on. In John's own words she was 'immensely loyal'. Motivated at last, John

did well at university and transferred to London after his first year. John and Muriel were married in 1937. It was an extremely successful marriage. Muriel's descent into dementia in her last years caused John much distress (Campbell, 2008).

Nigeria

In 1938, John gained a Colonial Service Veterinary Scholarship and in 1939 he received his MRCVS diploma from the Royal Veterinary College in London, even though he had not yet finished his course as he had failed Practical Animal Husbandry. That single failure proved to be significant, as it had moved him out of his cohort; although he was awarded the BSc degree by the University of London in July 1942 with first-class honours, together with the Coleman Silver Medal in Veterinary Medicine and the Gold Medal in Pathology, he had to wait until December to re-sit the practical examination.

Because it was wartime, the Ministry of War was responsible for the disposition of graduates to places of greatest need. When he received his degree in July 1942, John was initially posted to Kenya to work on cattle ticks. The Ministry allowed him to delay his departure to complete his course, however, and by the time he had done so, the danger of invasion of Kenya from neighbouring Italian East Africa was a matter for concern. As a consequence, John was posted instead to Vom Veterinary Station in Nigeria, and instead of becoming an acarologist he became a helminthologist (Campbell, 2008)!

Vom Veterinary Station is situated on the central plateau in Nigeria. It had first been established in Zaria to conduct livestock census and disease surveys and to recommend strategies for disease control. It was recreated and re-established in Vom in 1924 as a veterinary research laboratory. When Sprent arrived there in the early 1940s, its first Director, Captain W. W. Henderson, was still in charge, and the laboratory had successfully developed an anti-rinderpest serum to help control the viral outbreaks.

In spite of this specialization, it appears that John was allowed to choose the area in which he was to conduct his own research. Evidently, virology did not appeal to him. Instead, he became interested in bovine hookworm, *Bunostomum phlebotomum*, an important parasite of

Zebu cattle. This work resulted in his first scientific publications, that together described his exhaustive study of the ecology and life history of *B. phlebotomum*. He also began a study of the ways in which the parasite adapted to its host (1–7). The host-parasite relationship and, in particular, the cellular responses of the host to the parasite proved to be a life-long interest. Thus he established a platform for his many other life-history and immunological studies of nematodes.

On John's return to England, this work was rewarded with a PhD in 1945 from the University of London. In the context of the period it was written, the thesis was an early and quite outstanding investigation into the life history of an economically important parasite of cattle, leading to simple and straightforward proposals for the control of this and similar infections. *Bunostomum phlebotomum* is a significant pathogen of cattle, particularly in tropical countries. John provided the first detailed description of the life cycle of the parasite, including the morphological details of the pre-infective larval stages and, based on experimental infections, the morphogenesis of the parasitic stages. He showed experimentally that infection occurred by penetration of the skin by the third-stage larva, hitherto a contested phenomenon. He also studied the seasonal dynamics of the infection of naturally infected cattle in Nigeria.

What led him into this work was his interest in anemia in cattle, caused by blood-sucking hookworms the populations of which gradually increased in their small intestines. He showed that eggs are passed out in cattle droppings and hatch on the pasture into larvae that climb up grass blades and wait for another beast to brush by, whereupon they penetrate through its skin. They enter the bloodstream and pass to the lungs, are coughed up, swallowed and thus reach the small intestine. The approach John brought to this study almost forms a template for many subsequent studies (8–15, for example) that were enriched, of course, by improvements in scientific instruments and technique as the years passed.

In Nigeria, John worked and lived very closely with several Africans. The Europeans had their own club and John felt it was important that the Africans too should have a club because there was social pressure in those days for whites and

blacks to keep separate. So he established the Vom African Club. This resulted in an accolade of which he remained proud to the end of his life. The following is from a letter to him, dated 31 August 1945 and recorded in Campbell (2008):

I was directed by the committee and the entire members of the club to express their deep appreciation and gratitude for your philanthropic spirit which has brought our club into existence. You are assured that as long as we remain to enjoy the fruits of universal brotherhood of man which you practically demonstrated in your activities among the African staff of this station, your memory as the founder of the Vom African Club will never be forgotten in the history of our progress.

North America

While in Nigeria, John had read Talliaferro's important work on immunity to parasites (Taliaferro, 1929). Thus, in 1946, attracted by the presence of the two Taliaferros, William and Lucy, he moved to the University of Chicago for two years. He was supported for the 1946–7 academic year by a University of London Travelling Studentship combined with the Cooper Centenary Research Fellowship, and for 1947–8 he was awarded the University of Chicago's Seymour Coman Research Fellowship in Preventive Medicine. He was offered a professorship but declined it as it meant he would have had to renounce his British citizenship. At the end of his time in Chicago, after discussions with someone from the University of Toronto, he moved to Canada, to a position as a Senior Research Fellow of the Ontario Research Foundation in Toronto where he worked from 1948 to 1952.

John had become interested in Arctic animals and worked at several places on Hudson's Bay. Jonathan Sprent recalls:

My father relished life in Canada... we listened fascinated as he told us of life with the fur trappers in the north of Ontario, looking for interesting worms in the various animals caught in the traps. He was a wonderful raconteur with an engaging sense of humour. I remember him telling a group of friends how he spent a few days in the tiny hut of an Eskimo trapper and his wife near Fort Severn on Hudson Bay and how, out of politeness, the trapper had offered him his wife for the night, which greatly amused our adult friends—but left me as an 8 year old very confused!

John evidently had an interesting time! The Foundation was concerned, amongst other things, about an unusually high death rate among beavers, so John was flown into the Arctic on a plane modified for snow landings, to meet with a Native American in the employ of the Foundation. This man's task was to collect beaver carcasses and stack them in convenient (for him) places. John would then go out on foot—or more accurately, on snowshoe—to retrieve them for dissection (16–22).

After about four years, John began hankering for something new. He had developed a vision of life as a great 'pyramid' with lower invertebrates, of which there are millions of species, occupying the base. Larger and larger animals, with fewer species, progressively occupied the higher levels, the total number of species and individuals diminishing at each level. The middle levels were occupied by the large herbivores, all of which have nematode parasites. Ascaridoid worms start at the bottom levels as larvae and, by parasitizing one or more intermediate hosts higher in the pyramid, they promote themselves within it. Those whose definitive hosts are herbivores achieve promotion to the middle layers. The highest levels are occupied by the relatively few great carnivores such as polar bears, lions and eagles, and even these have ascaridoid parasites that, in their hosts, have thus achieved the highest points of the pyramid.

Where to go next to test this great idea? At the end of his Toronto fellowship, in 1950, John had amassed a great deal of information about the worms in his pyramid and decided that he ought to get back into veterinary work. Perhaps weariness with the Arctic climate also influenced his choice, as his next tilt at a post was as a Lecturer in Veterinary Parasitology in the University of Queensland, an institution about as far removed from the Arctic in climate as one could imagine.

Although this was a new position, the deadline for applications had passed. The Dean of the Faculty, Professor T. K. Ewer, himself newly appointed from Cambridge University, wrote, however, to say that the first round of applications had not produced a suitable candidate. The position therefore remained open and the teaching programme was being conducted for the time being by part-timers. John thought long and hard about the opportunity that was being offered. The disadvantages included the effort of

moving house and family to an unknown environment on the other side of the world, his salary would be less in relative terms than he received in Toronto, and the possibilities for advancement were unclear. He was, however, attracted by the challenge and established, by correspondence, a rapport with Professor Ewer and other academic staff, especially Dr F. S. H. Roberts, another expatriate Englishman, a veterinary entomologist for whose work John already had a high regard.

John began to feel that the position offered scope for developing parasitology according to his own ideas. He was at pains to establish, with the Dean, that the sort of course in veterinary parasitology that he wanted to teach was acceptable. He defined such a course as:

The morphology, life history and bionomics of parasites, i.e. protozoa, helminthes and arthropods, of domestic animals, together with the pathology, immunology, prevention and treatment of parasitic disease (135).

Satisfied, he began to make ready for the possible change of job and of continent with characteristic thoroughness. He determined what facilities and staff would be available to him for teaching and research and was careful to ascertain that long-term fundamental research was acceptable, arguing that all veterinary applications of parasitology should be grounded in the fundamental concept of the host-parasite relationship. With an eye to the future, he laid the foundations for a dedicated parasitology department by declaring his certainty that the study of parasites would become a recognized, independent branch of biology, and his conviction that the subject should be taught by specialist parasitologists.

Professor Ewer was extremely encouraging and John accepted the position after a voluminous correspondence that testifies to how keen the Dean was to attract someone of John's calibre. John had well defined views about how he wanted the position—and, by inference, the School—to develop. He wanted to teach parasitology as an integrated discipline that was much more than the segment that he characterized as 'veterinary parasitology'. It was going to be a long struggle as the Veterinary School's remit was to teach all of veterinary science, which did not include marine or medical parasitology.

Australia: First Impressions

John moved to the University of Queensland in 1952. He was convinced that the destiny of parasitology was as a 'stand-alone' branch of biology, a sub-discipline as distinct as, say, entomology was from zoology. He felt that the phenomenon of parasitism had sufficient unique characteristics to warrant establishing independent departments devoted to its study.

After a sea voyage from Canada to England and a holiday there to catch up with relatives and friends, the Sprent family set off from Tilbury for Australia on 24 April 1952. Where most of us would have determined to relax and enjoy the trip, John regarded it as a perfect opportunity to develop a fourth-year veterinary course and write the lectures for it—perhaps this was his personal formula for relaxation. It seems that he left the ship at Adelaide, to rejoin it at Melbourne or meet it in Sydney, in order to meet several eminent Australian veterinarians: H. W. Bennetts in Perth, P. W. Watts in Adelaide, and Sir Ian Clunies Ross and Lionel Bull in Melbourne. He flew to Brisbane to be there for the weekend meeting of the Australian Veterinary Association at which he met Hugh McL. Gordon and F. H. S. Roberts. It is noteworthy that another eminent parasitologist, W. P. Rogers, who was about to take up (or had just taken up) the chair of zoology at the University of Adelaide, does not appear on this list. One possible reason is that Rogers' strong leanings towards the biochemistry and physiology of helminths, rather than immunology, placed him outside John's immediate sphere of interest in which, at that time, those disciplines played little part.

John arrived in Sydney on 29 May, went straight to Brisbane and began teaching almost at once, having arrived too late for the start of the first term. He continued to develop the undergraduate courses that he had outlined to the Dean and, at the same time, began to extend the research on nematodes that he had started in North America. He discovered that two of the parasites that he had been studying in Canada also occurred in dogs in Brisbane. He found that after infecting mice with the eggs from worms in dogs, the eggs would hatch and the larvae would then migrate around the tissues of the mouse, and some of them would end up in the eye and the brain. At the same time, in New Orleans,

Paul Beaver had been working on somewhat similar lines and had discovered the occurrence of one of these larvae in the eye of a patient.

This illustrates one of the dangers, known as *larva migrans*, posed by ascaridoid nematodes. If the larvae hatch within an animal other than the definitive host they are often doomed to wander in an unavailing odyssey in search of their sites of predilection, where development can continue to completion. The movement of the larvae can often be traced by tracks in the tissues. In a small number of cases, however, the larvae arrive in the eye, where considerable damage may occur. In some case the larva becomes enclosed within a granulomatous lesion. Blindness often follows such invasions. Species normally infecting members of the Arctoidea (dogs, bears, raccoons) and the Aeluroidea (cats) pose a particular danger because of their many interactions with humans.

John published several papers on this phenomenon (23–31). The cause of the pathology is simple topography. Apparently a blood vessel associated with the retinal artery turns a sharp corner that the larvae cannot negotiate. Instead they burrow through the wall of the blood vessel into the retina where they produce a granuloma. During the three years or so that John devoted to this problem, he worked closely with medical eye specialists (Campbell, 2008).

The University of Queensland's Veterinary School was located in Yeerongpilly, a few kilometres south of the city centre and at that time not a particularly attractive area. This was not the original Veterinary School building, an imposing structure that had been built in 1938 and used for its original purpose until 1942 when the United States Army took it over for duration of the war. At the end of the war, it was returned to the Queensland Government which, much to the dismay of the academic staff, refurbished it as the Animal Health Station of the Queensland Department of Agriculture and Stock.

A photograph of the building that would be John's workplace, taken some time between 1949 and 1961, shows that it shared architectural features common to many of the fast-growing universities at that time: a hut complex with a central reception area and two wings. A visitor from the newly founded Australian National University, for example, would have felt quite at home. John said that he found the appearance 'something of a shock', an emotion he shared

with many British immigrants taking up academic posts even as late as the 1960s. However, it was 'rather quaint', there was a friendly, enthusiastic atmosphere and he sensed that 'here was the beginning of something' (135).

University of Queensland; Towards a Department of Parasitology

In the term break in 1952, John was able to tour Queensland, visiting places of veterinary importance, gaining an insight into the importance of sheep and cattle in the local economy and learning about the sort of parasitic material that would be available for his parasitology courses.

It is clear from his own writing that John was very ambitious and that from the outset of his time in the Veterinary School he was working towards the establishment of a Chair of Parasitology. As part of his strategy he began by increasing the number of courses offered. He divided the then existing Parasitology curriculum into three defined courses: Parasites (2nd year), Parasitism and Host-Parasite Relationships (3rd year), and Parasitic Diseases (4th year). He cast an eye on the parasitological offerings in the Zoology degree but realised that 'here was a situation of some delicacy' if he were to further the cause of Parasitology as an independent discipline. The fact that he was only a Senior Lecturer (he had taken a step down both in seniority and salary in his move from Canada) meant that, in modern terms, he lacked clout.

In an unusual departure into the passive voice, perhaps reflecting the sensitivity of the situation, he reports that, in 1953,

a statement was sent through the Dean to the President of the Professorial Board, members of the Standing Committee of the Professorial Board, the Dean of Medicine, the Professor of Zoology and the Professor of Veterinary Preventive Medicine (135).

This 'statement' argued in favour of an independent department or sub-department of parasitology. The responses were supportive, favouring the latter alternative, but no official decision was made. One indirect outcome was that in January 1954, Sprent was appointed as Research Professor in Parasitology. This gave him access to University research grants and funding from the Rural Credits Fund of the Commonwealth Bank of Australia.

Thus, the first part of his plan, to introduce teaching and research in all aspects of parasitology into the Veterinary School, was accomplished. What he now wanted was, effectively, to secede from veterinary science proper, and establish independent funding for his discipline. Pulling all the strings he could get his hands on, and at the invitation of the Vice-Chancellor, he put up a proposal to the Commonwealth Bank for the endowment of a Chair of Parasitology. H. C. 'Nugget' Coombs was the Governor of the Commonwealth Bank at that time and was very supportive. He approved a grant to the University to endow the chair, to which John was duly appointed.

John had not failed to recognize that the success of a sub-department would depend on an increase in the number of students and courses and that it was clearly necessary to commence teaching in the Faculty of Science so as to extend the scope of Parasitology. This was made possible by recruiting two new staff members. Sir Ian Clunies Ross, Chairman of the CSIRO, was approached and two research fellowships, in Helminthology and Protozoology, were made available. Drs J. Pearson and H. M. D. Hoyte took up these fellowships in 1955 (Campbell, 2008).

John also found time to put together a submission for a DSc to the University of London that was awarded in 1953. John's publication record shows that up to and including 1953, he had published a total of 23 papers (1–23). The first half dozen or so comprised his PhD work and have already been briefly discussed. The additional work upon which his DSc rested was carried out in the USA and Canada.

The common thread running through this work is the host-parasite relationship, starting with resistance to infection by ascaridoids, and the studies (10, 11, 14) of the toxicity and allergenicity of various tissue fractions of *Ascaris*. Anatomy and the migratory habits of larvae in mice are the subject of several papers, together with studies of ascaridoids from North American wildlife, particularly from bear and raccoon, skunk, fisher 'cat' and marten.

The 'statement' that John sent to the Dean, mentioned above, defines parasitology and elicits support for a dedicated sub-department. It had been prepared with very great care. John was aware of inter-departmental sensibilities and was concerned that other Heads of Departments

might think that he was trespassing on their territory. The departmental structure within the Veterinary School was blurred as the teaching staff was listed under the Faculty rather than under separate departments. There were four academic streams; the fourth, to which Sprent was assigned as Professor and Head, was an uneasy alliance of Veterinary Anatomy and Parasitology.

In October 1955, at the invitation of the Research Committee, John submitted a detailed proposal, through the University of Queensland, to the Commonwealth Bank of Australia, and copied to the Executive Council of the CSIRO. It was for the establishment of a Parasitology Department and Chair of Parasitology. It had the strong support of the Dean of the Veterinary School. The Commonwealth Bank duly awarded a grant to the University for the establishment of the Chair of Parasitology within the Faculty of Veterinary Science. In the words of the announcement by the bank:

This move places Australia on a level with other Commonwealth countries which possess Chairs of Parasitology. It gives the subject appropriate academic status and provides a starting point for its development to the stage where the University will be able to provide an all-round coverage by establishing facilities for postgraduate studies in the various aspects of parasitology (135).

A Short Digression

One must pause at this point to admire John's energy, dedication, perseverance and ambition, both for himself and for his subject. It is remarkable that in these few years of turmoil, of moving from Canada to England and thence to Australia, of finding and settling into a new home in Brisbane with his wife, Muriel—who must have been a pillar of strength—and three young children, settling into a new department, setting up laboratories, organizing teaching, that he found time to do research and to write.

His publication output was considerable. During his career, he published 134 papers in learned journals. Of these only fourteen had more than one author, quite a remarkable record and quite at odds with modern practice. Of that fourteen, Ann Mckeown who curated his helminth collection was a joint author on four, the first in 1967 and the last in 1998. She clearly knew him very well.

Ann remembers that the Sprents would give parties for the Veterinary Science students and for staff at their home in Moggill. These usually involved a lot of effort for Muriel as the numbers were quite large, even in those days. Muriel, she says, was an immense support, staying in the background and allowing John to devote so much of himself to his work.

Muriel was a real source of strength for John and she adored him. She brought up three children—Jonathan and Anthony, who also became eminent academics in their own right, and Elizabeth, who was a nurse. A youthful Tony could never say anything derogatory about his father in his mother's presence—she would staunchly defend her husband (Anthony Sprent, personal communication).

It is Ann who allows us a brief glimpse of other interests. John obviously arrived in Australia intending to buy a farming property, but without much background knowledge. She tells how, having come from Canada and having seen an advertisement for a farm with a pine plantation, he was disconcerted to be confronted not by pine trees but by pineapples!

He eventually bought a dairy farm in 1954 at Moggill. It was obviously run down and John commented that you could count the number of live trees on it on one hand, the rest had all been ring-barked. He immediately set about a tree-planting programme, aiming to re-establish the dry rain-forest of the area, dominated by such trees as hoop-pine and lace-bark. At the end of his life he was proud to report that there were about a thousand mature hoop-pines that he had planted.

John's reclamation project was extremely successful and when the Wildlife Conservation Partnership Program began in Brisbane at the end of the 1990s, his property was the first to be incorporated into a 'Land for Wildlife' agreement. He continued to run cattle, of which he was very fond, on the property at Moggill until he had to move into a nursing home.

Professor of Parasitology

One former student remembers John at this time. Nobel Laureate Peter Doherty recalls:

I was mad keen on immunology, and quite inspired by a little book he wrote on parasitism (45) that was heavily influenced by

Mac Burnet's ideas [Sir Macfarlane Burnet, Nobel Laureate in medicine, 1960]. But my handwriting was so bad that he couldn't read my exam paper. He had me read it out to him, though he told me I couldn't do better than a pass grade. Still, he was sympathetic, asked questions and we had an amiable chat. Those of us who were interested in science knew that he was a substantial figure, and we were a little in awe of him.

John was also active at this period in Brisbane, declaring his presence in his new community with addresses to the Association of Clinical Pathologists and the Australian Veterinary Association. Writings for a more general audience included 'How do animals get worms?' for *Queensland Country Life*, 'Reflections on Nigeria' for *Apsyrus*, the journal of the University of Queensland Veterinary Students' Association, and 'The Fiery Serpent' for the Royal Society of Queensland (see bibliography). He was clearly an enthusiastic communicator of his science at a time when such activity was regarded as rather below the dignity of many scientists.

He was appointed to the Chair of Parasitology in 1956. At the time he was occupying temporary accommodation within the old building. The following year, however, the University decided to build a new Veterinary School on the main campus at St Lucia, with provision for parasitology. To hasten matters, for space was scarce, he offered to house only parasitology teaching staff in the new building while the research staff remained at Yeerongpilly, gambling that the State Government would soon want to resume the old buildings. He won his bet. The new Veterinary College was ready by 1961 and the parasitologists were only split geographically for four years. In that period John continued to pursue his campaign for a 'free-standing' parasitology department. In 1961 he was elected Dean of the Faculty of Veterinary Science, which gave him a secure power base from which to prosecute his plans.

As long as he had responsibility for veterinary anatomy as well as parasitology, John felt hindered in his quest to enlarge the parasitology staff. It helped that, in 1959, he received approval to change the name of the Department from 'Veterinary Anatomy and Parasitology' to 'Parasitology, with which is associated Veterinary Anatomy'. It was a political move that

put emphasis firmly on parasitology. Better still, in 1960, Veterinary Anatomy disappeared from the title and the 'Department of Parasitology' was at last a reality. In 1961, the University Senate recognised the *fait accompli* and approved the separation of veterinary anatomy and parasitology. At last, John could appoint teaching staff committed exclusively to Parasitology. The removal of the research staff from Yeerongpilly to St Lucia occurred in 1964. Sprent wrote that the mid-sixties was the time when all his plans since his appointment twelve years earlier came to fruition. The teaching syllabus was stabilized and a large number of effective research programmes were in place. His own research continued to flourish, and in spite of the teaching and administrative load he carried he had since 1955 published 31 papers (24–55) on various aspects of ascaridoid nematodes.

If the 1950s decade saw the full flowering of veterinary parasitology in Australia, it could equally be said that the 1960s saw a revival of medical parasitology. Most Australian parasitologists had up to this time evinced little interest in parasitology in South-East Asia, perhaps because in this region parasitological research was mainly directed towards human rather than animal infections. A change in this attitude had come about in November 1962, when the First UNESCO Regional Symposium on Tropical Parasitology was held at the Department of Parasitology in the Medical School of the University of Singapore. The programme comprised one day of survey papers relating to the background and progress of work in the various countries in the region, three days of research papers, and one day devoted to a discussion on future policy for co-operation and interchange in the South-East Asian region.

John seized the opportunity. The contacts he made at the Regional Symposium led to invitations to contribute to other meetings, especially those sponsored by the World Health Organization, at Geneva and Rio de Janeiro (1963), Manila (1965), Noumea (1967) and Teheran (1968). Back home, he introduced new courses in medical parasitology, in both the Faculty of Science and the Faculty of Medicine. An application to the Wellcome Trust resulted in a fellowship in medical parasitology to commemorate the pioneering work on filariasis of Joseph and Thomas Bancroft in Brisbane. Hugh Idris

Jones, a graduate in medicine and zoology at the University of Wales, was appointed to the position in 1969. He had had considerable field experience in East Africa and Brazil and was to work on helminthiasis in human populations in Papua New Guinea and East Timor (135).

The Dream of Camelot Fades...

The newly fledged Department of Parasitology continued to flourish as an effective international institution under John's guidance until he retired in 1983 at the age of 68. As well as keeping up his other responsibilities, he had continued to pour out an average of three or four papers on nematodes per year (56–115). After a short inter-regnum under Duncan Hoyte, Colin Dobson was appointed to the Chair in 1985 and held it until 1998, when it was once more merged with Microbiology. John, now 83, was obviously disappointed. He wrote of this decision with some bitterness mixed with regret, for it seemed to him that in spite of a strong history of scholarship and a continuous output of successful graduates, several outstanding departments at the University of Queensland had been wantonly scrapped in the era of Executive Deans, myriad reviews, increased accountability, newly formalized occupational health and safety requirements, and the growth of the concept of Human Resource Management. His lifelong passion, the Department of Parasitology, was one of them. The University had, in his view, turned back the clock more than forty years and much that he had fought for had been lost. He took a little comfort from the fact that the new department was named 'Microbiology and Parasitology', but how much more disconcerted must he have been to learn that parasitology at the University of Queensland had become subsumed within the Faculty of Science in the School of Chemistry and Molecular Biosciences!

To others, however, the University of Queensland's Department of Parasitology appears as a sort of parasitological Camelot sustained by the ideals, energy and strength of character of one man who surrounded himself with a cohort of highly able teachers and researchers. John saw parasitology as an independent discipline in the terms of the early part of the twentieth century and sought a dedicated department in the second half of the century. Unfortunately, the

study of biology was about to undergo a metamorphosis. Instead of stressing the differences between disciplines, biologists after 1960 sought to emphasise what animals—and plants and microbes—had in common. The decipherment of the genetic code changed everything.

How was it, then, that such a flourishing enterprise should fade? The answer is that the Department of Parasitology in Queensland was sustained by the vision of one man. It was John's dream made bricks and mortar and flesh. The University of Queensland, like every other university, was caught up in the post-DNA revolution. He was one of the last of the 'god professors' of the nineteenth and early twentieth century who could influence university policy, and he brought with him an approach to science characteristic of those days, an approach that was soon to disappear in the face of the New Biology. John's academic staff was hand-picked and fiercely loyal to him and, in return, he allowed freedom of research and teaching within broadly defined boundaries. As he retired, however, the era of team research, of co-operation between departments and universities at home or overseas, the era of shared technologies, had arrived. The days of the eighteen-author scientific paper had begun.

The Australian Society for Parasitology (ASP)

The inaugural scientific meeting of the Australian Society for Parasitology was held on Saturday and Sunday, 18 and 19 January, 1964. Unfortunately some of the early records are missing from the archives held at the Australian Academy of Science. It is, however, clear that, driven by John and several senior colleagues, including Professors J. H. Arundel, W. P. Rogers and J. D. Smyth, there had been much informal discussion about the formation of an Australia-wide parasitological society (Bryant, 2009).

Although the Australian and New Zealand Association for the Advancement of Science (ANZAAS) had provided a forum for scientists—and the public—to meet to discuss general scientific issues, there were at that time only a few discipline-specific associations at which Australian scientists could meet and discuss research. The initial consultations made it obvious that there was strong support for a forum

dedicated to parasitology, in addition to opportunities offered by ANZAAS. It is likely that John initiated these discussions because such a society was wholly in accord with his strong push to get parasitology recognised as an independent discipline.

Discussions before the inaugural meeting went on for more than a year. A report dated 3 June 1963 and received and initialled 'JHA' by Professor Jack Arundel refers to a Provisional Committee of the future society. Chaired by John, this had already met and sought expressions of interest from potential members. The report states that about fifty positive responses had been received and that a progress report and a preliminary announcement of the first meeting of the fledgling society had been prepared. A constitution had been drafted and, cheekily but quite consistently with John's proactive inclinations, the proposed Australian Society for Parasitology (ASP) had already been affiliated with the World Federation of Parasitologists, which itself had only come into existence in September 1962, in Rome, Italy! The Federation was already developing plans for the First International Congress of Parasitology (ICOPA 1), to be held in Rome.

On 13 November 1963, the Progress Report duly went out to prospective members for discussion at the inaugural meeting and with a plea that representatives from all branches of parasitology should attend. Prepared by John, it is worth quoting at length:

Parasitology has been something of a Cinderella among the biological sciences, probably because the subject comprises a constituent part of many diverse fields. Thus in different parts of the world, parasitology has arisen as a branch of Medicine, Veterinary Science, Zoology, Agriculture etc., and accordingly, parasitologists have owed their allegiance to these special biological disciplines. Now the time has arrived when parasitology takes its place as a basic biological discipline on its own. This trend is reflected in the recent establishment of several (national) Associations or Societies of Parasitology.

Australia is in the forefront of this trend and the Australian Society for Parasitology is now incorporated in the World Federation. The future holds considerable promise for parasitology in Australia, and it is important that at this stage all those interested in parasitology should show

their full support so that the discipline of parasitology can be firmly established on a sound basis as a subject in its own right (quoted in Bryant, 2009).

With those words, John both defined his personal scientific philosophy and identified the dilemma it faced. It is difficult to ignore the facts that parasites are not homogeneous groups and the habits of parasitism differ between groups. On the other hand, parasitism and symbiosis as a way of life is of profound importance in driving evolution, beginning with the first prokaryote and the origin of the eukaryotic cell.

John was the foundation president of the ASP, serving from 1964 to 1966. Over the next decades the Society proved to be a highly popular forum of debate and discussion among parasitologists of all persuasion, except for the malariologists who came late to the feast. John's formal interventions after his term in office were few but always effective. For example, the debate about whether the ASP should sponsor an international journal (see below) seemed to have stalled on concerns about the cost to the Society until John threw his weight behind the 'ayes'. After he took over the editorship from Desmond Smyth, he seems to have made extreme efforts to negotiate the favourable contracts, first with Pergamon and later with Elsevier, that have provided the ASP with a considerable annual income, enabling it to make many awards and fellowships available, especially to its junior members.

Two other examples show John's influence at work behind the scenes. A long-running dilemma of the ASP was how to preserve the various valuable helminth collections in the country. The first idea was to concentrate them in a single institution. Parochial concerns, however, made this at least extremely difficult, if not impossible. It was John who cut the Gordian knot with a proposal at the 1990 annual general meeting 'that the Society recognise that the Australian Parasitological Collection should comprise all the specimens of parasites presently housed in Museums, University Departments, research institutes etc. throughout Australia', and called for a committee to oversee the curation. His own considerable collection is in the Queensland Museum.

The second example concerns the sixth International Congress of Parasitological Associations Conference (ICOPA VI), that took place

in 1986. It was quite in keeping with John's aspirations for parasitology that, having established the University of Queensland as the major centre of parasitology in Australia, he should then want to put Australian parasitology on the world map. And what better way than to bid for—and win—the competition to mount the conference?

Once again with characteristic thoroughness John set to work. The ASP had established an initial committee (Drs Alan Donald and Joe Boray) to set up the mechanisms by which the Society would choose a venue at which to hold ICOPA. But after one year, in 1981, only one bid had been submitted, prepared by John and a colleague, Ken Bremner, proposing the University of Queensland and its Department of Parasitology. The quality of the supporting material, included a short video of welcome, spoken by John, was of a high order. Other places were belatedly proposed but the Sprent bid was so overwhelming that these offers were soon withdrawn. Finally, the burdensome task of creating and chairing an organizing committee was gratefully handed to John.

The Australian bid was presented to the World Federation of Parasitologists in Toronto in August 1982. The quality of the bid was highly praised by all delegates and it was widely thought that it would be accepted unopposed. However, at the last minute two other bids, from The Netherlands and India, were entered. In the face of some powerful lobbying by The Netherlands, it became apparent that the result was not a foregone conclusion and a counter-lobby was begun of which the major weapon was a brief travelogue showing Brisbane and Australia as a background to John Sprent extending a personal invitation to visit Brisbane in 1986.

The result of the vote is now history. At the Council Meeting of the WFP, India withdrew its bid, offering instead a preliminary meeting in Bombay. Then came the final vote. One delegate, wearing the hats of two affiliated societies, cast them both for Australia, and Australia had defeated The Netherlands by a single vote (Bryant, 2009). Those involved heaved huge sighs of relief. It would have been unthinkable to have to return to Australia and tell John that his precious Congress was lost! ICOPA VI proved to be a triumph, for John and the ASP.

The International Journal for Parasitology (IJP)

A major contributing factor to the success of the ASP is undoubtedly its very successful journal, the *International Journal for Parasitology (IJP)*. The foundation year of the ASP, 1964, predated the information technology revolution by a decade or more. It is not therefore surprising that within three years of the ASP's foundation there was talk of a new international journal specifically designed to allow more rapid publication. It was one of the few initiatives in Australian parasitology in which John was not a prime mover. His time came later. At a council meeting on 8 August 1967, the Society's president, Professor J. D. Smyth, suggested that 'in view of increasingly slow publication time in existing American and British journals of parasitology it might be worth considering setting up a new International Journal'.

Attitudes within the Society were at first equivocal. On the one side were those who thought there were already too many journals and that to found a new one would be a futile exercise. On the other were those who, like Professors Smyth and Sprent, were enthusiasts. In the middle was a group of parasitologists who saw opportunities in a new journal but conceived it as something more parochial, possibly an *Australian Journal of Parasitology* or even a *Journal of Australian Parasitology*.

Due largely to Smyth's efforts while on a visit to Britain, Pergamon Press Ltd undertook to publish the *International Journal for Parasitology* as the official organ of the Society. Smyth, *in absentia* but with his agreement, was elected unopposed as the first editor of the journal, the Society accepting his proviso that his term as editor should be limited to three years.

The journal was launched successfully and Smyth fulfilled his obligation to the ASP and continued as editor until Volume 3 had gone to press. At a council meeting on 16 February 1973, a unanimous vote appointed John Sprent as his successor. John was to occupy that position, with distinction, for more than twenty years. Editorial reports over those years show the *IJP* going from strength to strength. The new editor immediately expanded the scope of the journal to include taxonomic papers. Administrative changes included the appointment of a deputy editor and an Editorial Board comprising

regional representatives to maintain the international flavour of the *IJP*. As well, an Advisory Board was established to help formulate editorial policy. Finally, John arranged for the University of Queensland to provide administrative support and appointed Mary Cremin as editorial assistant. She became a member of the ASP in 1976. At that time, because 'Ms Cremin's efficiency has ensured smooth continuation of editorial requirements while Professor Sprent is away', she was elected Honorary Editorial Secretary. She remained a stalwart of the *IJP* for many years. Mary's huge contribution was recognised by the ASP when she was elected a Fellow in 1994. Eventually she became John's second wife, Muriel having died in 1998.

After twenty years as editor, in 1993 John declared his intention of retiring at the end of 1995. The succession did not occur without some controversy. Council determined, after much debate and negotiation, that a new editor be appointed from the beginning of 1994. In his final report to the Society's annual general meeting (dated 31 March 1994), John indicated his disappointment that he had not been allowed to retire at the time he originally proposed—that is, the end of 1995—and expressed his disapproval of the method adopted for selecting a new editor. He particularly felt that 'there is too little involvement of the membership of the ASP as a whole with IJP policy and perhaps too much reliance on the Executive'. This disappointment aside, he went on to say that he had, on the whole, enormously enjoyed his term as editor and bestowed his blessing on Drs A. Donald and P. Boreham who jointly replaced him.

John had stood down as Head of the Department of Parasitology in 1974, in order to become editor of the *IJP*. His period as editor was marked not only by the care and meticulous attention to detail applied to the manuscripts being sent to the publisher, but also by his championing of an open refereeing system in which referees were encouraged to make their names available to the authors in order to promote and foster international liaison among parasitologists. He also championed the journal as a truly international one, open to parasitologists from every nation including those working under difficult conditions with poor financial support and to those experiencing difficulty in preparing their papers in a foreign language. Thus while

maintaining very high standards, his editorship was marked by compassion, helpfulness and humanity towards authors and referees alike. His retirement from the editorship of the journal, it was recorded,

after twenty years of distinguished service not only to the Journal but also to the discipline of Parasitology is clearly a significant milestone in the continuing development of the Journal and warrants an expression of appreciation for the time and effort devoted by him to the fostering of a truly international journal for parasitology. With this aim in mind, the Council of The Australian Society for Parasitology agreed that a special issue of the journal should be published at the time of his retirement, to mark, in some small way, his achievements and contributions and to act as a token of gratitude from the Society for his endeavours. (Beveridge and Boreham 1994).

John was much touched by this gesture which perhaps smoothed his sense that he had been disposed of with undignified haste:

I was for 20 years editor of the *International Journal for Parasitology*, and this was a source of pride to me – particularly to get the volume of the journal which I was presented with when I retired, when people said some nice things about the publication and so on (Campbell, 2008).

The Contribution to Parasitology of John Sprent

John's major scientific contribution to parasitology was made through his studies of ascaridoid nematodes. His initial encounter with the group came during the Second World War when he was posted to Nigeria as a veterinary officer to examine problems associated with *Ascaris suum* in pigs. Although he found few *A. suum*, he did discover *Toxocara vitulorum* in very young calves. Infection so early in their lives suggested that the calves had acquired their infections from their parents by a trans-mammary route. This discovery prompted him to revisit the question posed by earlier workers as to why many nematodes, such as *A. suum* and *T. vitulorum*, with direct life cycles based on ingestion by the host of eggs containing infective third-stage larvae and hatching of the eggs in the small intestine, migrate to various sites around the body of the host before finally returning to the intestine to reproduce.

His major work at this time was, however, the elucidation of the life cycle of *Bunostomum phlebotomum* (1–8).

In North America John continued to pursue such studies with ascaridoid nematodes of various carnivores such as racoons, skunks, martens, bears and wolves belonging to the genera *Toxocara*, *Toxascaris* and *Baylisascaris*. He showed that, in several these species, the larvae did not complete a hepato-pulmonary migration as is the case with *A. suum* in pigs but migrated instead to the tissues (kidney, brain and muscle) of rodents and became there encapsulated, each species having a slightly different pattern of migration. The rodents may therefore be considered to be secondary hosts and the life cycle is completed when they are eaten by the definitive host. At about the same time, larvae of the dog ascarid *Toxocara canis* were identified in humans, localizing in the eye and in the brain, adding a zoonotic aspect to the studies of migrating ascarid larvae (9–20).

In Queensland, John embarked on definitive studies of the life histories of the common dog and cat ascaridoids, *Toxocara canis*, *T. cati* and *Toxascaris leonina* (21–36). Although these species of nematodes were relatively well known, John published what are now the definitive studies on the life cycles of the three nematodes with meticulous attention being paid to migratory patterns of larvae in mice and the morphogenesis of the larvae (27, 28, 30, 31, 33, 35). He also undertook epidemiological investigations, including studies on the survival of eggs in the environment.

John then turned his attention to ascaridoids in the native fauna, describing the morphology and life cycles of *Porrocaecum ratti* and *Toxocara mackerassae* (87) in native rodents and *Baylisascaris tasmaniensis* (88) in Tasmanian devils. As the latter is the only ascaridoid known in Australian marsupials, it presented a puzzle as to its origins. The latter study was not simple logistically as it involved infecting Tasmanian devils with larvae recovered from intermediate hosts. John also became interested in reptiles, since the common carpet pythons found in the environs of Brisbane were frequently infected with three species of ascaridoids, *Ophidascaris filaria*, *O. robertsi* and *Polydelphis anoura*. John described *O. robertsi* as a new species, initially under the name *Amplicaecum robertsi* (46, 47).

He made detailed studies of the morphology and life history of each species, showing that an intermediate host was essential in the life cycle and that the definitive host, the python, could not be infected with eggs, a finding critical to John's subsequent work. To undertake such studies, it was necessary to rear worm-free pythons and parts of the Department of Parasitology became filled with young pythons being raised for John's experiments. John subsequently extended his studies to other species occurring in pythons in South-East Asia and Africa. He recounted visits to Asian countries in which he would buy live pythons at markets, return to his hotel and autopsy them in his hotel room. Eggs from gravid worms could be kept moist and returned to Australia in his hand luggage for experimental infections of rodents in Brisbane (79–109).

Even giants stumble. In a study that must now stand as a warning to all young parasitologists, John described a new species of ascaridoid, *Cotylascaris thylacini*, from the now extinct thylacine, *Thylacinus cyanocephalus*. The work was based on worms collected from one of the last captive animals in the London Zoo (81). Following the publication of the description, it became evident that the nematodes that John had described were in fact specimens of the common pigeon ascarid *Ascaridia columbae*, which his colleague John Mines happened to be working on at the time. On further investigation, it appeared that the thylacine nematodes had been collected from the faeces of the thylacine rather than from its intestine and that the thylacine had probably caught and eaten a pigeon in the zoo. Bravely—and, one can imagine, with a self-deprecatory chuckle—John published a second paper in *Parasitology*, synonymizing *Cotylascaris* and *Ascaridia columbae* (83) and providing an hypothesis for the presence of the nematodes in the faeces of the thylacine. One can imagine the error rather appealing to his sense of humour, once he had got over the disappointment.

Following his official retirement from the University of Queensland, John continued his work on ascaridoids, publishing an astonishing series of more than thirty papers on the systematics of various genera and erecting several new genera and species (96–134). His work was extremely thorough and was based on the examination of material in all of the major museum

collections around the world as well as his own extensive collections. This collection of papers represents potentially the most significant contribution made to ascaridoid systematics in recent decades.

John also made significant contributions to studies of the evolution of ascaridoid nematodes and their life cycles (42, 43). In his view, ascaridoids diversified initially in crocodylians with a two- or three-host life-cycle. Most ascaridoids initially depended upon a predator–prey relationship and hence used food chains to reach their definitive hosts. John described this as a 'pyramidal' system rather than a 'cycle' (45). He identified two patterns in the evolution of ascaridoids, the first being 'host-range expansion' in which hosts from various taxonomic groups feed on a common intermediate host and thereby ingest the larval stages of the same species of ascaridoid. For example, both pythons and raptors may feed on rodents infected with the larval stage of an ascaridoid nematode. The second pattern he termed 'host-succession-extension', whereby nematodes adapted to living in higher-order predators so that the parasites of rats, for example, became the parasites of rat-eaters. These ideas were quite significant during an era when the principal paradigm of parasite evolution was co-evolution, in which the evolution of the parasite mirrors that of the host. He also established that the tissue migrations in direct life cycles such as that of *A. suum* represented a secondary adaptation to a non-carnivorous host with omission of the intermediate host, the hepato-pulmonary migration being the part of the migration that *would have* occurred in the now non-existent intermediate host. Thus by the end of his career John had provided convincing answers to some of the questions that first attracted his attention to the ascaridoids.

In a review of the ascaridoids published in 1992, John lamented the large number of host species known to harbour ascaridoids that are currently considered threatened or endangered, speculating that with the hosts we may also lose a significant number of unique and interesting parasites. The title of his article was, appropriately, 'Parasites Lost?' (130).

In 1963, John published a small book entitled *Parasitism* (45) that proved to be extremely significant at the time. It was an attempt to put a new perspective on the concept of parasitism.

Parasitism is a mode of feeding, and he defined it in terms of an immunological association. His discussion, replete with examples, ranged widely over the many types of biological associations, defining the diverse nature of host-parasite relationships and their evolution. He argued that parasitism differs from all other biological associations in that an intimate macromolecular contact is established, enabling the host to recognize the associated organism as foreign and thereby evoking an immunological response. Less intimate associations such as commensalism and predation are therefore excluded. In this context, he introduced the concept of 'adaptation tolerance'. His book thus clarified and directed much thinking on the nature of biological relationships, emphasizing the duality of the association between the host and its parasite.

John Sprent made a major contribution to the study of ascaridoid nematodes. No other worker has contributed so significantly to the systematics, life histories and evolution of this group of nematodes.

Conclusion

We have told the story of John's masterwork, the Department of Parasitology at the University of Queensland, as a single continuous narrative because John himself saw it as his greatest achievement. When, after having talked at length about his Department, he was asked about his personal achievements as distinct from his scientific ones, he seemed a little taken aback. He certainly felt it was his greatest achievement and felt proud of it (Campbell, 2008).

A lay-person may understand better with a musical analogy. An orchestral conductor has a vision of the music that he wishes to make with his chosen instrument, an orchestra, and selects its membership, choosing the quality, number and range of its instruments. A great conductor can conjure great performances from the orchestra and over many years will build up a heritage of fine, recorded music. So it was with John's Department of Parasitology. It was his vision, towards which he worked tirelessly. He selected its members and welded them into a team that for nearly fifty years produced excellent parasitological research that is still accessible and relevant today. It also produced several generations of graduates, many of whom are still producing

fine work. Without John none of this would have happened. His dream called the Department into existence but with his departure it could not withstand for long.

Of his scientific work John said, with his usual modesty, that he accumulated rather than achieved. He accumulated an enormous amount of information about ascaridoid nematodes, representatives of a Phylum of which there are many sub-orders and an enormous number of species:

There are an enormous number of species in this group, and they occur in different countries, different parts of the world. I wanted simply to accumulate a knowledge of that particular group of parasites—how they got into their hosts and what they did when they got there, their public health importance (Campbell 2008).

John's final *cri de coeur* asks whether, in the modern era where Australian universities seem more concerned with 'product' than with scholarship, parasitology can survive as a discipline in its own right. The Achilles heel of parasitology as a 'stand-alone' discipline is that it is such an interdisciplinary activity that the people who matter view it as derivative and tend to oppose the concept of a dedicated department on the basis that it would merely duplicate aspects of other discipline-based departments such as biochemistry, biology, genetics, immunology, microbiology, molecular biology and pathology, and perhaps restrict their access to the technology of those disciplines. Even the old disciplines of the 20th century are changing in the 21st under the impact of the new: informatics, genomics, proteomics, metabolomics, phenomics and any other -omics that you might think of. But probably not parasitomics.

Last Words

It is obvious that John was highly regarded by his staff and his colleagues. Ann McKeown, who did his curating, considered that John was the perfect gentleman. He was, she wrote, a very thorough worker and worked very hard to achieve all his varied projects and was dearly loved by his staff (personal communication). This regard was reciprocated by John:

I do feel that in any scientific achievement one is dependent on technical assistance from people, and throughout my time in the University of Queensland I have received an enormous amount of help, of different kinds, from various

people. First of all there's my second wife (Mary Cremin), who was my assistant for about 40 years. She accumulated all the knowledge, all the reference work, all the reprints, all the literature necessary for me to study these things, and I simply couldn't have done it without her. And then there was Ann McKeown. All the specimens that I collected, she collated them, labelled them and kept them, and these were the ones that were handed over to the Queensland Museum. Also John Mines gave a lot of time to sectioning specimens for me.... (Campbell, 2008).

He was also very proud of the fact that he had been able to publish his research for more than sixty years.

Acknowledgements

We wish to thank Professors Jonathan and Anthony Sprent for their recollections of family, and Professor Peter Doherty and Ms Ann McKeown for theirs of studying and working in the Department of Parasitology. A major primary source for this memoir is the Australian Society of Parasitology's mammoth compendium *A History of Parasitology in Australia and Papua New Guinea* (eds. I. Beveridge and P. J. O'Donohue, 2009) which contains, apart from many references to John Sprent by others, a major contribution by the man himself (Chapter 6; the University of Queensland). The second major source is an interview with John by Julie Campbell in 2008, recorded as part of the Australian Academy of Science's initiative, *Interviews with Australian Scientists*. We would also like to acknowledge Elsevier Publishing Co. and the Editor of the *International Journal for Parasitology* for permission to reprint Mary Cremin's bibliography of John Sprent's published work.

Selected Invited Lectures and Articles

- 1947 Ascariasis – Bacteriology Club, University of Chicago, U.S.A.
- 1948 Mechanism of immunity in worm infections – Chicago Veterinary Medical Association, Chicago, U.S.A.
Immunology in *Ascaris* infections – Biology Club, University of Toronto, Canada.
- 1949 Human Parasitology – School of Hygiene, University of Toronto, Canada.
- 1950 Course of instruction in Parasitology – Forest Ranger School, Ontario, Canada.
- 1951 Migratory behaviour of various *Ascaris* species from Canadian wild animals – Fifth Annual Technical Session, Advisory Committee on Fisheries and Wildlife, Toronto, Canada.
- 1953 Nematodes in the central nervous system – Association of Clinical Pathologists, Brisbane
Migratory behaviour of ascaridoid larvae – Australian Veterinary Association, Brisbane.
How do animals get worms? – Queensland Country Life.
Life cycles among the Ascarididae – *Veterinary Newsletter* 1(3): 1–4.
The Fiery Serpent – Royal Society of Queensland, Brisbane.
Reflections on Nigeria – *Apsyrus* 3: 12–13.
Migrations of *Ascaris* larvae and their occurrence in the nervous system – *Veterinary Newsletter*.
- 1954 Research – Address to veterinary students, Yeerongpilly, Brisbane.
Evolution of the *Ascaris* group of nematodes as shown by life history studies – A.N.Z.A.A.S., Section D (Zoology), Canberra.
Ascaris larvae in the nervous system – A.N.Z.A.A.S., Section L (Veterinary Science), Canberra.
Ascaris allergy – Veterinary School Tea Club, University of Queensland.
- 1955 Observations on kidney worm in pigs, redworms in horses, and roundworms in cats – Australian Veterinary Association (Queensland Division).
Research in parasitology – *Veterinary Newsletter* 2(1): 5–7.
Immunity in helminth infections – A.N.Z.A.A.S., Section D (Zoology), Melbourne.
The life history of *Ophidascaris filaria* – Queensland Association of Clinical Pathologists, Brisbane.
- 1955 Observations on the life history of *Toxocara cati* and other ascaridid nematodes of terrestrial animals – A.N.Z.A.A.S., Section L (Veterinary Science), Melbourne.

- The life history of nematodes in the family Ascarididae – Society of Entomologists, Brisbane.
- Worms and animal production – Animal Production Society, Brisbane.
- 1956 Establishment of the Chair of Parasitology in the University of Queensland – Australian Broadcasting Commission. News Review, Brisbane. Parasitology and the newly-established Chair of Parasitology – A.B.C. Science Commentary, Brisbane.
- Immunity in helminth infections – *Veterinary Newsletter* 2(4): 3–6.
- The Crossroads – *Apsyrus* 6: 30.
- Statement on establishment of the Chair of Parasitology in the University of Queensland – *Apsyrus* 6: 59.
- 1957 Parasitology in Australia – *A.B.C. Weekly*.
- 1958 The Threshold – *Apsyrus* 8: 22–24.
- 1959 Research on carpet snakes – A.B.C., Brisbane.
- 1961 The integration of the biological sciences – Symposium on Veterinary Education, Australian Veterinary Association (Queensland Division). The immunological basis of individuality- A.N.Z.A.A.S., 1961 Chairman's Address to Session 5 of Section I (Microbiology), Brisbane.
- A salutation on the occasion of the Silver Jubilee of the establishment of the Faculty of Veterinary Science within the University of Queensland – *Apsyrus* 11: 5.
- Address by the Dean at the Opening of the Veterinary School at St Lucia.
- 1962 Address to American Society of Parasitologists on presentation of Henry Baldwin Ward Award, Washington, D.C.
- Pests and Diseases – A.B.C. Country Hour.
- 1963 Recent advances in immunology – Veterinary School Tea Club, University of Queensland.
- 1964 Undergraduate veterinary education – A.N.Z.A.A.S. Symposium on Veterinary Education, Section L (Veterinary Science).
- Migratory behaviour of ascaridoid larvae – Institute of Parasitology, Montreal, Canada.
- Ascaridoid life cycles – School of Hygiene, University of Toronto, Canada.
- Migration of ascaridoid larvae and their identification in tissues – College of Veterinary Medicine, University of Illinois, U.S.A.
- Visceral larva migrans – Department of Zoology and Physiology, University of Nebraska, U.S.A.
- Identification of ascaridoid larvae in tissues – University of California, Davis, U.S.A.
- Visceral larva migrans – Department of Parasitology, University of Chile, Santiago.
- 1965 Nematode larva migrans – Invited address to British Society for Parasitology, Glasgow.
- Migration of nematode larvae particularly in relation to larva migrans in man – London School of Tropical Medicine, London.
- Host-parasite relationships and types of immunity – Seminar at Physiology School, University of Queensland.
- The excretory system of nematodes – Parasitology Seminar, University of Queensland, Brisbane.
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- 1968 Immunology and parasitic infections – A.N.Z.A.A.S., Christchurch, New Zealand.
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