Barry Collin: A Visionary for a New Direction in Optometry

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ABSTRACT

Dr. Barry Collin represents the best in academic optometry. An educator, scientist, and visionary, he has throughout his long and distinguished career made important contributions to our understanding of ophthalmic pathology. He has also had an enormous impact on raising the level of optometric education and expanding the scope of optometric practice. This profile covers much of Dr. Collin's professional career, offering insights into what has made him one of the key leaders in Australian and international optometry.

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round the time Tony Adams was recruited to join the Berkeley Optometry faculty, I was completing my graduate training at Berkeley. Our mutual colleague and friend, Mert Flom, introduced me to Tony and we quickly became good friends. Before our meeting and all through my professional training, I had not heard anything about Australian Optometry, except that I knew one of my instructors, Gerald Westheimer, had graduated with an optometry degree from the University of New South Wales. On many occasions, Tony would talk about Australian optometry and, in particular, he would often mention one of his instructors at Melbourne who had made quite an impression on him while he was an optometry student. Tony would speak with the highest regard about this person's research in ocular pathology. He would also tell me that this instructor was a talented clinician, an excellent teacher, a cutting-edge vision scientist, and a leader in the profession. At the time, I wondered whether there could really be someone who could have accomplished all these things until I had the pleasure of meeting Professor Barry Collin. I was quickly convinced that he was in fact all that Tony had claimed and more. What I did not know was that he was not only a leader but also a visionary in the growth and establishment of modern-day Australian Optometry.

Barry Collin: Of Mind and Body

Professor Barry Collin was born in Melbourne, Australia in 1933. He was the third in a family of five children. His father

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was one of the first to practice optometry in Melbourne, and Barry always knew that at least one of the siblings would (must) become an optometrist, although he was not sure it would be his destiny. However, during these early years, Barry had no time to think about his future career, as he was totally immersed in school. He had rigorous precollege training, particularly in science and mathematics. He excelled in school, always performing at or near the top of his class. Most likely his talent for academic achievement and the intense training in the sciences influenced Barry's decision to enter optometry and later to continue his career in teaching and research.

In addition to his academic ability, Barry was also a gifted athlete. His passion for sports continued throughout his life. In high school, he was captain of the school swimming team. He also represented his school in tennis and competed in the Victoria State under 16 gymnastics championships, when his team earned a respectable second place. Barry was an avid field hockey player, becoming team captain and earning a place on the Victoria State under 16 field hockey team; later, he was vice-captain of the Victorian State under 21 field hockey team. At university, he received a University Blue as "Best and Fairest" player and was selected by the All-Australian Universities field hockey team in 1954. University work did not interfere with Barry's dedication to athletics. After his optometry and graduate training, Barry continued to be active in competitive tennis and squash. This high level of athletic energy persisted until he retired from academic life, when he decided to take up golf and avoid less physically demanding activities. In Professor Collin's own words, "obviously sport was important in my life and it was through hockey that I met my wife, Bev" Barry clearly demonstrated that mind and body can work together, each complementing the other to achieve one's goals.

Choosing a Career

When Barry was completing his high school training, it became apparent to him that either he or his older brother Damon would enter optometry. Damon actually entered optometry but had a tragic and fatal bike accident. So, Barry's next step became clear, and he began the 4-year optometry program in 1951. At that time, optometry in Melbourne was taught jointly at the Australian (now Victorian) College of Optometry and the University of Melbourne. All basic science subjects were taught at the university, including chemistry, physics, biology, mathematics, physiology, biochemistry, and microbiology. The clinical program, however, was completed at the college, which awarded a Licentiate of Optometric Science (LOSc). The degree allowed one to practice optometry in Victoria. In addition to qualifying for the LOSc, optometry students had the option to take additional coursework and complete a university baccalaureate degree. Barry's appetite and talent for academics made the choice obvious, so he enrolled in physics as a submajor during his final year of optometry. Barry notes that the subjects he elected for his baccalaureate degree had to "have relevance to optometry . . . [and he] . . . considered that physics, vertebrate zoology and pathology all had some relevance" All of Barry's elective course work was motivated by his desire to gain additional knowledge and not specifically directed toward pursuing a career in academic optometry, since at that time there were no full-time academic positions in optometry in Victoria. Josef Lederer was the only full-time academic in Australia, having been appointed in Sydney in 1947. Barry completed his elective studies fully expecting that his career would be dedicated to private optometric practice. He completed the LOSc in 1954 and received the Bachelor of Science (Pathology) in 1956. This was the first degree in pathology to be awarded to an optometrist in Australia, and to my knowledge, internationally.

Moving toward Academic Optometry

Barry states in his autobiographical notes that during "my optometry course, the emphasis was on optics and clinical optometry The subject 'Physiological Optics' did not exist, and only twenty-seven curriculum hours were given to diseases of the eye. Hence, although we optometrists knew the basics, our expectations in diagnosis were very limited." Perhaps, it was this limitation that served as the catalyst for Professor Collin to study anatomy and pathology. It was not too long after Barry received his degree in pathology that some of his optometric colleagues were beginning to recognize what he had achieved in his university studies. It was quickly understood that Barry's newly gained expertise in pathology could be put to good use in the optometry curriculum, so in 1957, John Nathan, then Director of Studies at the Australian College of Optometry, invited Barry to present four lectures on ocular tumors. One lecture quickly turned into 10, and by 1959 Barry was teaching the entire course on diseases of the eye. Being responsible for the course in ocular disease while still maintaining a full-time practice was not easy, but Barry made time and provided the college with an excellent and inspiring course in ocular disease. Barry's experience in academics was personally rewarding. Barry states that by 1961, "I found that I preferred the lecture preparation to seeing patients and decided it was time to investigate academia."

The timing was right. Academic optometry was beginning to undergo important changes. In 1959, Professor Barry Cole had been appointed as the first full-time faculty member of the Victorian College of Optometry. A year later, the college was searching to fill a second full-time position and, as Professor Cole states, "Barry Collin picked the right time to apply." In 1961, Barry met Dr. Cole for coffee and asked him for a position at the College. Without hesitation, Cole agreed, and Collin became a Temporary Assistant Lecturer. The "temporary" title was used because the school was unsure about its budget and did not want to commit to a permanent position. Nevertheless, Dr. Collin accepted the offer and was assigned responsibility for teaching the entire program in ocular disease and much of the clinical curriculum. Barry's appointment and faculty assignment is of historical significance for Australian optometry. During the 1950s and early 1960s, optometrists were not allowed to refer patients to ophthalmologists. To strengthen their position, ophthalmology vigorously opposed any development in the area of ocular disease, claiming that optometrists did not have the training to diagnose ocular conditions. To make sure this was the case, ophthalmologists were forbidden by the Royal Australian College of Ophthalmologists to teach or lecture to any optometric group or college. Because of this exclusionary medical edict, there was a great need within optometric education to develop a curriculum that would strengthen the level of biological/medical teaching and particularly ocular pathology directed toward diagnosis and management of ocular disease. Destiny had clearly marked a path for Barry's career. Without doubt, Professor Collin became the recognized leader and motivator in developing curricula and programs that would ultimately lead to expanding the scope of optometric practice to include the diagnosis, and later treatment, of ocular disease. Barry's vision for optometry in the early 1960s was ahead of the curve, and Australian optometry owes him special recognition for his leadership in helping to make the profession what it is today.

Developing the Research and Clinical Expertise

When Barry joined the optometry program, it had ceased to be a private college and had become part of the University of Melbourne. University faculty was expected to not only teach but also conduct research. Regardless of Barry's extraordinarily heavy teaching load, Dr. Cole made it clear to Barry that he was also "expected to pull his own weight, too [in research]." Barry knew that to carry out cutting-edge research in ocular disease, he not only had to "talk the talk, but also walk the walk" to provide as he states, "teaching [and research] with creditability." To achieve that goal, Dr. Collin knew that he would need advanced graduate training in the biological sciences. At that time, Professor R. Douglas Wright, who served as Head of the Department of Physiology at the University of Melbourne, had a project that he first offered to the Department of Ophthalmology. Fortunately for Barry, no one in ophthalmology was interested, so Wright offered it to optometry. Barry eagerly



FIGURE 1.

(R) Prof. Collin with (L) Prof. Hank Hofstetter outside the School of Optometry at Bloomington in 1970. Professor Collin had been to London to receive the International Optometric and Optical League Medal (the forerunner of the International Optometrist of the Year awarded by the World Council of Optometry). While in Indiana, Collin was offered an academic position at the school.

accepted the opportunity to work with Professor Wright, who was a well known and highly respected member of the Australian academic community. Dr. Wright later became Chancellor of the University of Melbourne and was instrumental in founding the Australian National University and several other research institutions. As Barry says, "Professor Wright was my supervisor for my Master of Applied Science, 1966 (Optometry) and later the PhD degree, 1970 (Faculty of Medicine) . . . and my mentor throughout my academic life. He suggested my [first] research project, namely, to establish whether lymphatic vessels could invade the mammalian cornea following injury, and had a lasting influence on my entire academic career." This was the first PhD to be awarded to an optometrist in Victoria and the second to any optometrist in Australia. Barry's schedule was now complete (full time teaching and research); however, as demanding as it was, Barry and Bev maintained an active family life, including rearing four children.

The Academic Years

Many milestones mark the productive and successful career of Professor Collin. In 1962, Barry began research to investigate whether lymphatic vessels could invade the cornea in response to trauma. In doing this, he was the first optometrist in Australia (and possibly in the world) to conduct research using experimental animals. In 1967, Barry was invited by Howard Florey (Lord Florey), the Nobel Laureate (for his work on the development of penicillin) to work in his laboratories in Oxford. Next, in 1968, Dr. Collin worked for 1 year as a research fellow at the Sir William Dunn School of Pathology at the University of Oxford in England. Using electron microscopy, Barry demonstrated definitively the differences between blood and lymphatic vessels in the eye and the presence of new lymphatic vessels in the corneas of rabbits and rats after injury. In 1975, Professor Collin





(R) Prof. Collin with Laila Hanninen at the Eye Research Institute of Retina Foundation, Boston in 1975, as a Corneal Fellow under Prof. Claes Dohlman.

served as a Corneal Fellow (the first optometrist to do so) at the Eye Research Institute, Boston (Retina Foundation). While there, Barry had the good fortune to work with world-renowned Claes Dohlman, Professor of Ophthalmology at the Harvard Medical School. It was at Harvard that Dr. Collin carried out some of his seminal research on the pathology and ultrastructure of human corneal and conjunctival tissue. Also during the Boston period, Barry was able to gain additional clinical expertise in ocular disease by spending 1 day a week participating in the Cornea Service at the Massachusetts Eye and Ear Hospital. Barry worked with several of the ophthalmologists who were at the forefront of anterior segment disease, including Mathea Allansmith, Mark Abelson, and Peter Donshik. As Barry states, "That year was a life changing experience and yielded twelve publications." Barry returned to Boston again in 1986, completing an important study showing that lymphatics had the ability to grow into vascularized human corneas. Four years later, Barry worked for 6 months in San Diego at the Ophthalmology Research Laboratory with another well-known corneal ophthalmologist, Perry Binder. Barry helped develop an in vitro model for corneal wound healing, using organ-cultured human corneas. Professor Collin's research program resulted in over 150 publications on experimental pathology and clearly demonstrated to optometry and the vision research community that it was possible for an optometrist to



FIGURE 3.

Prof. Collin (third from L) at an Optometry meeting in Jakarta with (first from L) Dr. Damien Smith (later President of the World Council of Optometry) and (second from L) Dr. Burt Holmes (President of the International Optometric and Optical League) in April 1989.



FIGURE 4.

(Center) Prof. Collin receiving a certificate of Appreciation from (R) Prof. Richard Hill in January 1990 for his participation in the College's Distinguished Speakers Series for the Decade of the Nineties.

compete successfully on the world stage and publish in highly respected biology journals, something that most faculty in optometry did not achieve until much later in the twentieth century.

Who's Who in Optometry

Dr. Collin's career is marked by his enormous success not only in research but also in teaching, developing advanced curricula, administration, and clinical practice. In fact, Dr. Collin represents the quintessential university professor, something that many faculty strive for but few achieve. He has received many awards and honors over his 50 years of academic life. It is beyond the scope of this profile to list all these honors, so I have selected just a few. In 1969, he received the International Optical League Medal from the International Optometric and Optical League for outstanding contributions to the advancement of the science or profession of Optometry. This is still the first and only medal awarded to an Australian optometrist. The League has been superseded by the World Council of Optometry and the award by the "World Optometrist of the Year." In



FIGURE 5.

(L to R) Prof. Henry Hofstetter, Prof. Collin, Mrs. Bev Collin and Mrs. Jane Hofstetter visit a Hindu temple in Indonesia while attending the Eighth Asian Pacific Optometric Congress in April 1991.





Prof. Brien Holden, Mr. Lloyd Hewett, Prof. Gerald Westheimer, and Prof. Collin in 1998 on the occasion of the award of an Honorary Master of Science degree to Mr. Hewett (Editor of *Clinical and Experimental Optometry*, 1962 to 1979).

1971, Barry received the Shorney Prize, awarded by the Faculty of Medicine of the University of Adelaide for "the greatest contribution to knowledge in Ophthalmology in publication over the previous three years." To date, this has been the only time this award has been made to an optometrist. In 1977, the Australian Optometrical Association honored Professor Collin by establishing a medal in his name (HB Collin Research Medal), which is awarded to an individual who has made outstanding contributions to eye and vision research. In 1981, Barry was awarded Honorary Life Memberships in the Australia Optometrical Association and the Victorian College of Optometry in recognition of his lifelong service to the profession. In 1992, he received the Vice-Chancellor's Award for Teaching Excellence at the University of New South Wales. In 1991, Dr. Collin was invested as a Fellow of the Royal College of Pathologists in London, which was a world-first for Optometry. In 1997, he was made a Member of the Order of Australia, a highly prestigious honor, awarded by the Federal Government of Australia for services to optometric research and education in the Asia-Pacific region. The following year, Barry received a Doctor of Science by the University of New South Wales for a dissertation entitled, "The Morphology and Pathology of the Eye."



FIGURE 7.

(L to R) Prof. Shaun Collin, Prof. Barry Collin, Mrs. Bev Collin, and Prof. Leo Carney, Head of the School of Optometry at the Queensland University of Technology, on the occasion of the award to Prof. Collin of an Honorary Doctor of the University by the Queensland University of Technology in October 2003.



FIGURE 8.

Bev and Barry Collin at home on the occasion of their 50th Wedding Anniversary on December 28, 2007.

Most recently, he was appointed Professor Emeritus of the University of New South Wales, Honorary Professor at The Hong Kong Polytechnic University and Honorary Doctor of the University at the Queensland University of Technology. Barry was one of the first Australians to become a fellow of the American

Academy of Optometry (1965) and is currently a Life Emeritus Fellow. For the last 15 years, Barry has been the Editor of Clinical and Experimental Optometry, which has just celebrated its 91st year.

Time Out

Was there any time in Barry's life for anything else but academia and optometry? As you might expect, Barry was a complete person, never letting his professional career become so overwhelming that it left no time for family, friends, and community service. One of the most difficult aspects of academic life is balancing teaching, research, and administrative duties with family commitments. Barry was fortunate to have a very capable and loving wife, and together they must have done something right, as they have four wonderful and supportive children and five grandchildren.

Although preferring to remain in the background, Barry was frequently thrust into the limelight. On attending one meeting of a kindergarten, Barry came home as president. He was Secretary of the Fathers' Committee at one of their children's school and after attending a meeting at the local Catholic Church, he was elected President of the Parish Council. In 1977, a chiropractor approached Barry to assist his profession in the fight for recognition and particularly the battle against medical opposition. He became a member of the Australasian Council on Chiropractic Education, their national and international accrediting body, for 24 years and President of the Board of Directors for 10 years. It appears that when he saw a need, Barry was unable to say "no."

Dr. Collin's Later Years

In 1992, Professor Collin retired as Head of the School of Optometry, University of New South Wales, a position he held for over 10 years. During his tenure, there was a ninefold increase in the number of peer-reviewed research grants to the school and up to a fivefold increase in peer-reviewed publications. In addition, the Cornea and Contact Research Unit within the School of Optometry blossomed from a small group of investigators into a world-renowned, multimillion dollar research center. Also during this period, Professor Collin was appointed Editor of *Clinical and Experimental Optometry*; he still serves in that position after 15 years.

Barry retired from the University of New South Wales in 1995, when he was honored as Professor Emeritus. He returned to Melbourne with an appointment as Honorary Professor at the University of Melbourne. In the spirit of hard work and achievement that has guided his entire life, Barry submitted a thesis and was awarded a Doctor of Science from the University of New South Wales in 1998.

During 1998 and 1999, Barry spent several months as a Visiting Professor at the University of Auckland in New Zealand, where he designed and taught a theoretical and practical course in ocular pathology. Then, in 1999, Professor Collin commenced an association as both an Honorary Professor and Visiting Professor at The Hong Kong Polytechnic University, where he taught ocular disease and pathology, spending around 2 months every year in Hong Kong for the following 9 years (until 2007). Throughout this period, Barry continued to publish research articles with his son Shaun, and clinical articles. Now in "retirement," Barry continues with his editorial commitments. He enjoys playing golf and is active in his local Catholic church. He also spends more quality time with his wife Bev, his children, and grandchildren.

What Others have to Say about Professor Collin

Professor Leo Carney: "I consider myself extremely fortunate to have known Barry as my teacher when I was an undergraduate student, a mentor during my graduate studies, an academic colleague, and a friend. Barry's doctoral research on corneal lymphatics was groundbreaking and internationally recognized for its scientific importance It also gave Australian optometry a much-needed academic strength and standing, it helped position optometry as a serious academic discipline, and it helped develop in the optometry profession an understanding of the value of scholarship which is still evident today His later research on the histopathology of anterior eye disease only further enhanced his reputation as a pathologist of note. Perhaps unusually for someone so skilled at laboratory investigations, Barry has always maintained his connection with clinical optometry, part of the reason for the great respect given him by practitioners. His support of other colleagues, in the same way that he encouraged me all those years ago when I was starting out, is characteristic of his approach to his work, his profession, and to his community. He's a great ambassador for optometry."

Professor Barry Cole: "Barry Collin joined the faculty of the Victorian College of Optometry in 1962 after seven years in clinical practice. He was the second full-time member of faculty in what was, at the time, a very small and under-funded College. I was the first to be appointed a full-time faculty member four years earlier. He made an immediate impact because he had a BSc degree with a major in pathology, which together with seven years of clinical experience added authority to teaching in diseases of the eye. Just the year before, the College had been affiliated to the University of Melbourne and the optometry course had become a degree course in the University. Now that the College had university status, the imperative was to get a significant research program going, and Barry Collin played a very important part in responding to that challenge. His research project was to explore whether lymphatic vessels would proliferate into the tissue of an injured cornea. If they did, it would help explain corneal graft rejection. Lymphatic proliferation into the cornea was considered unlikely because the cornea is avascular. He tackled this project with great flair and vigour, publishing the results in prestigious international journals such as Experimental Eye Research, Investigative Ophthalmology, Lancet, and the Journal of Pathology. One paper got the front cover of Investigative Ophthalmology and was reprinted in Year Book of Ophthalmology for 1966 to 1967. Our research initiative was well and truly launched. The Optometry College at the Melbourne University was on the international map."

Professor Shaun Collin: "Barry Collin has been a powerhouse in research and scientific engagement for nearly fifty years. Although this may make him seem old, his enthusiasm towards optometry and vision research and his enthusiasm for life still burn bright. Although I may be biased, Barry Collin has been my best collaborator, where we have shared and conquered many scientific problems together. These are lasting memories. There are few which demand such respect as a person and as a colleague."

Professor Claes Dohlman: "Barry is a great fellow who was an inspiration to all of us in the Cornea Lab of what was then (in the 60s and 70s) called the Retina Foundation, but was later renamed Schepens Eye Research Institute. In the culture of that time, laboratory researchers often appeared as pale-skinned, bespectacled introverts. And here came Barry, looking like a real outdoors man, a true Crocodile Dundee! Could somebody that healthy-looking do credible research? Indeed he could! Barry turned out to be a star who clarified by elegant electron microscopy very important aspects of corneal anatomy, pathology, and lymphatics. His role in corneal research gradually became monumental, and we are proud of having worked with him and learned from him."

Dr. John Nathan: "I have known Barry since he was an undergraduate student some 56 years ago both as a colleague and close personal friend. I have known him as a determined, unpretentious, self confident and methodical person. These qualities together with a high degree of intelligence have made him the excellent researcher he has proved to be."

Dr. Damien Smith: "Honesty is a word that springs immediately to mind when asked about Barry Collin. It is reflected in the objectivity and integrity of his research, and in the frankness of his personal relationships. Barry remains uniquely lovable because of the ambiguity of his persona-if you have his respect, he is at the same time your strongest advocate and your strongest critic. He makes a great friend because he forgives your weaknesses. Barry has always been committed to his family from whom he derives comfort and affirmation. He is exceptionally fortunate to have coauthored important research papers with his eldest son-a rare professional and academic privilege. In Australia, perhaps because his father was a practicing optometrist, Barry has contributed significantly behind-the-scenes to the political advancement of the profession, a role which is known and acknowledged by the cognoscenti but unrevealed to the profession generally. He has never been guilty of self-promotion, nor has he piggy-backed on the work of others."

Professor George Woo: "In the early nineties, University of Auckland's Optometry program underwent a major review. The University appointed three Optometry academics. They were Michel Millodot, Barry Collin, and myself. In addition, there was also a member from the University of Sydney's Ophthalmology Department on this review committee. During the process, the ophthalmologist was quite vocal against any development plan of the Department of Optometry I remember that Barry confronted him head-on in one of our sessions and maintained the position for Optometry in a dignified manner. The exchange between these two men impressed me. I knew then that Barry could be firm in defending Optometry's position effectively. In addition to Barry's strong commitment to the profession, he was a great educator and teacher. In one of the joint meetings of The Hong Kong Polytechnic University and the Hong Kong Society of Professional Optometrists . . . Barry spoke on an aspect of ocular pathology related to his research. In the audience, there were a few ophthalmologists who were obviously awed by his depth of knowledge in the subject. We (School of Optometry) were proud of him.

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On a personal note, Barry and Bev always travel together. They are a wonderful couple well liked by all of us. They mingle well and they participate in all kinds of activities whenever they are here in Hong Kong. We love them. When Barry told us late last year that it was probably his last year teaching in Hong Kong, we all felt sad and we shall definitely miss them."

Professor Maurice Yap: "Barry's reputation and standing in Hong Kong and Asia Optometry is legendary. Some of the most outstanding optometrists in Asia (and especially in Hong Kong) were his students in the University of Melbourne and the University of New South Wales. From advising on syllabus content to sourcing and teaching pathology 'like a pathologist,' his enthusiasm was always evident. Perhaps we should not be too surprised by this—after all, Barry is the only optometrist (that I am aware of) who is a Fellow of the Royal College of Pathologists and he has always been happy to share his experience with us in a reflective way. Consequently, our academic and clinical staff have always looked up to Barry as a mentor. One reason why Barry is so popular is that he is a humble and approachable person with a clear sense of right and wrong. He has high integrity."

Lets talk with Barry

Polse: You have had an amazing career in education, clinical care, and research. Could you identify the people who most influenced your career and describe how they helped mold your professional development?

Collin: Professor RD Wright had an enormous influence on me. He was my supervisor during my Masters and PhD degrees and mentor during my academic life. An example of his generosity is that when he was Chancellor of the University of Melbourne, he took time to coach me before I had an interview for the position of Head of the School of Optometry at UNSW. There are two optometrists for whom I worked briefly in practice. Both are examples of how optometry should be practiced with the utmost care for patients and the highest ethical standards. When I was a student, Dr. John Nathan was the Director of Studies at the VCO and an outstanding practitioner, teacher, and researcher in Melbourne. Dr. Lloyd Hewett was a renowned contact lens practitioner, teacher, and clinical researcher in Sydney.

Polse: You have made some important discoveries during your research career. Could you briefly summarize the major discoveries you have made and how each of these may possibly translate to patient care?

Collin: My discovery that lymphatic vessels could invade injured animal and human corneas was probably the most important area of research, as it found its way into several medical textbooks. I published qualitative and quantitative descriptions of lymphatic growth and ways to prevent growth. This was important as it explained why and how the body is able to recognize the foreign tissue and hence, opens doors for treatment.

In a series of eleven papers, I showed that preservatives found in ocular medications and contact lens solutions can be toxic to the cornea. Benzalkonium chloride (BAC) reduces the rate of epithelial healing, while BAC, thimerosal, and chlorbutanol all cause endothelial changes, particularly if the epithelial surface is abnormal. Working with Dr. Mathea Allansmith, I was the first to show ultrastructurally that the mechanism of vernal conjunctivitis in humans is a delayed basophil hypersensitivity and that contact lens-induced GPC and suture-induced GPC have a similar mechanism mediated by basophilic leukocytes. Working with ophthalmologists in Boston, we were able to describe the ultrastructural details of superior limbic conjunctivitis in humans, including the process of keratinisation and the best treatment strategy. In addition, there are many clinical papers, which I hope are of benefit to practicing optometrists.

Polse: You were one (if not the first) optometrist to do basic and clinical research in biology. How did you choose biology as opposed to the more traditional areas for optometric research that were popular at that time (such as binocular vision, color, psychophysics, optics)?

Collin: In the early 1950s, we were taught some ocular (vegetative) physiology but no physiological optics. In addition, although clinical teaching was quite good, optics, binocular vision and color vision were taught by practitioners and, with due respect to our teachers, they were not well taught and they failed to excite me. I enjoyed the course in pathology, part of which was taught with the medical students, although we spent more hours on pathology than they did. I found it exciting to see the results of an experiment under the light and transmission and scanning electron microscopes and this thrilled me more than manipulating figures to find a statistical significance. If I could see it, it was true.

Polse: Barry, I have noted your many successful collaborations with ophthalmologists, particularly in the United States. Was it difficult to find academic ophthalmologists in Australia who were interested in collaborating with you? What were and (perhaps still are) the barriers for ophthalmologists and optometrists working together in Australia?

Collin: Although I worked as a sessional optometrist assisting ophthalmologists in a large hospital for about six years, the ophthalmologists were tolerant but not enthusiastic about my presence. In the 1960s, ophthalmologists could not be seen to assist an optometrist or optometry in any way, and my appointment was terminated. One ophthalmologist in Australia permitted me to observe during corneal graft surgery; however, my attempts to obtain corneal graft buttons for research purposes and other forms of collaboration were unsuccessful. In Boston, I was accepted as an equal, not as an optometrist but as a scientist. Most of my life I have been in conflict with ophthalmology and on occasions with ophthalmologists. I was evicted from an ophthalmology congress in Melbourne because I was an optometrist. One research manuscript was rejected by the British Journal of Ophthalmology because the discussion (by an optometrist) was considered too clinical and unnecessary. It was accepted, in toto, by Investigative Ophthalmology and Visual Science. (At the time, 1965, I was probably the only Australian optometrist to be a member of ARVO). A second manuscript was returned from Archives of Ophthalmology with the comment, "In all frankness, I have to also tell you that some of the reviewers were slightly surprised to find that the senior author is an optometrist. Maybe he is in reality a microbiologist or biologist and in that case maybe the footnote of his being on leave from the Department of Optometry, University of Melbourne could be deleted. This is a somewhat sensitive issue and I would like to hear your opinion about it." In spite of these problems, in the 1980s a few academic ophthalmologists were cooperative and supportive of research by optometrists. In recent years, since the introduction of laser refractive surgery, ophthalmologists lecture to optometrists at congresses and there is dialogue between the two professions, but there is still conflict concerning the use of therapeutic agents.

Polse: When you were developing your career as both an educator and researcher, you were working in an area (disease) that was almost completely absent from the optometric curriculum. Was it difficult to convince the optometric community that your work was a necessary part of the process to expand the curriculum in ocular disease?

Collin: As my career progressed, I became able to relate the pathology of a condition to the clinical signs and symptoms. This helped practitioners understand the clinical conditions better and hence, to improve their diagnostic skills. In the absence of ophthalmologists on the lecture circuit, practitioners loved to know why, and in some cases I was able to tell them. I was in considerable demand and presented well over 400 lectures at congresses and continuing education courses.

Polse: Barry you played a major role in redesigning the optometric curriculum related to ocular disease so that optometry could expand its scope of practice to include the diagnosis and eventually treatment of ocular disease. You were certainly far ahead of most of the profession. Can you remember what it was that gave you this early vision of why and where the profession needed to go?

Collin:I always believed that optometrists have a responsibility to recognize eye disease. However, to recognize a condition we need to understand it, which really means we must be able to diagnose it. Ophthalmology claimed that optometrists could not diagnose ocular conditions; however, every time we say a patient is "normal," I believe that this is a diagnosis. Thus, optometrists must be experts in diagnosis.

Polse: How severe was the opposition from medicine to expanding the optometric curriculum? Would you share with the readers some of your personal encounters with medicine?

Collin:All branches of medicine and in fact most professions try to "protect their patch." Hence, there has always been some opposition to the existence of optometry and particularly to our expansion into the use of diagnostic and therapeutic agents. Of course, I supported these moves but I was not directly involved in the politics and I congratulate those who were so successful in their endeavors.

Polse: In addition to having a very successful and productive career in vision research, you have been frequently referred to as one of the best educators in Australian optometry. What do you believe are the necessary qualities that make a great teacher?

Collin: Perhaps the first criterion for a good teacher is to know your subject and to prepare your material very thoroughly. Secondly, it is very helpful if you enjoy your subject and enjoy teaching it. Teaching is so much more than just words and pictures, it is about logical thinking and enthusiasm, which must be conveyed to the audience, whether undergraduate students or professional colleagues.

Polse: I often meet with students who tell me they are interested in teaching and research. What advice would you give to an optometry student who expresses interest in pursuing a career in academic optometry?

Collin: If you have an enquiring mind and you like students, an academic life can be very satisfying. I have always enjoyed my academic career, whether teaching, research, or administration, and I believe that it is like being paid to do your hobby.

Polse: Many clinicians and educators believe that research is not important to the mission of optometry/ophthalmology. With so much research being done at so many institutions, some have questioned whether academic optometry/ophthalmology programs should use their limited resources to support research. Why not just pay educators a higher salary to attract better teachers to the program and leave research to other institutions? What are your thoughts on this?

Collin: Any definition of a profession includes that it must have its own body of knowledge. This requires research to expand that knowledge. In addition, it is our responsibility to do research to increase our knowledge base to benefit our patients. I also believe that in general, the best teachers are those who research in the same field that they teach.

Polse: Barry, you had the vision, long before most of us in the profession, that optometry must get heavily involved in the biological sciences with a definite aim to use diagnostic and therapeutic drugs. How did you see so clearly in those early years what now the profession takes as a "given."

Collin: I was never conscious of having a "vision." It just seemed obvious to me that optometrists treat patients, not eyes, and to do this we need a broad knowledge of the human body and its functions. In addition, it was always my opinion that to understand ocular disease, we needed to understand the pathology behind the disease rather than try to memorise a list of signs and symptoms. The same is true of all aspects of optometry, which means we should have some knowledge of all of the human biological sciences.

Polse: I know you have four wonderful children. I also know that you developed a very close professional relationship with your son Shaun. Could you tell us a little about your work with Shaun and what he is doing now?

Collin: In the 1970s, I was able to purchase a "preloved" transmission electron microscope for the Department of Optometry in Melbourne and this was very unusual for an optometry school. When I moved to the University of New South Wales in 1982, I took the electron microscope with me. In about 1985, I suggested to our son Shaun at Scripps Institution of Ophthalmology, who was a marine biologist but is now a neuroscientist, that he should extend his research on retinal histology and topography of various fish species to examining their ultrastructure. During my six months in San Diego in 1986, I worked with Shaun at Scripts Institution of Oceanography and this was the beginning of an excellent and very productive partnership. To date, Shaun and I have published twenty-one research papers together on the ultrastructure (both TEM and SEM) of the retina and cornea of a large number of species and investigated some of the environmental adaptations of the eyes. Currently, Shaun is a full Professor and Deputy Head of the School of Biomedical Sciences at the University of Queensland.

Polse: All these questions have dealt with your professional career and related interests and opinions. However, I know that you have done much more than just confine your life to vision. Could you share with our readers some of your other activities, particularly your achievements in sports and what athletics have meant to you over your lifetime?

Collin: I played sport because I have ways needed challenges in my life and also I needed to be physically fit to meet the demands of academic life with its long hours and of family life raising four children. My involvement with other organizations, such as chiropractic, kindergarten and school committees, the National Vision Research Institute of Australia, and so on resulted from a perceived need and the hope that I could contribute.

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Polse: You have been witness to almost unbelievable changes in the prevention, diagnosis, and treatment of eye disease and disorders. Could you share with our readership what you consider to be the most significant developments in the vision field during the last 50 years, and why they were so important?

Collin: This is a very difficult, if not impossible, question because so many things have happened. As a student, I learned nothing of contact lenses because the only contact lenses were of molded glass and optometry was not involved. The use of diagnostic and now therapeutic drugs each caused a minor revolution in the way we examine and manage patients. The advent of new instrumentation such as automated perimetry, non-contact tonometry, OCT, etc. has changed the way we practice, while the introduction of progressive lenses has changed how we prescribe. Finally, the development of optometry throughout Asia has been phenomenal over the last few decades. Polse: Barry, thank you for participating in this profile. Your vision and leadership have advanced the profession of optometry both in Australia and internationally. Your contributions have clearly set a new benchmark for optometric education and research.

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