

PROFILE

Donald Ezekiel AM: passionate and innovative contact lens practitioner and manufacturer

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Donald Ezekiel (known to all as 'Don') was born in Singapore on September 12, 1936, to a German mother and Iraqi father. His parents were Jewish refugees, who met in Batavia,¹ married and alternately lived in Batavia and Singapore. The family established their primary residence in Singapore after Don's older brother Eric (later to become a haematologist) was born in 1934. The Ezekiel family was forced to flee in 1941 when the Japanese bombed Singapore and were fortunate to obtain passage on a hospital ship to Perth. They returned to Singapore after the war but left again on their own accord in 1951 due to race riots. The Ezekiels sold up everything in Singapore and decided to settle in Perth.

Don's father was a prominent optometrist who had practices in Batavia and Singapore and when he arrived in Australia established a small practice in Perth. Don followed in his father's footsteps, graduating with a Diploma in Optometry from the Optometry Board of Western Australia in 1957.² He worked in the family practice of 'M. Ezekiel and Sons' in Perth before travelling to Melbourne to gain experience with the esteemed optometric establishment Coles and Garrard. Don began to develop an inter-



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est in contact lenses and in 1960 he travelled to Sydney to be taught scleral lens fitting by Lloyd Hewett.¹

SEEKING FURTHER CONTACT LENS KNOWLEDGE

Don was aware that great leaps forward in the contact lens field were taking place in the UK. So in 1963, only four days after marrying Challis, Don and his new wife travelled to London, where Don enthusiastically set about gaining a wide variety of clinical experiences. In a wise strategic move, he sought to establish credibility in the field and embarked upon post-graduate studies, obtaining his Diploma in Contact Lens Practice and Fellowship of the Association of Contact Lens Practitioners. He recalls gaining invaluable experience, while attending a contact lens course at City University conducted by Robert Fletcher, head of optometry and later professor.

Now Don has a charming demeanor, infectious smile and hearty laugh, and he seems to have used these traits to great effect by endearing himself to various luminaries in the field. Before going to London, Don held a position as honorary optometrist at the Royal Perth Hospital. He used that connection to obtain an introduction to Frederick Ridley, who was head of Moorfields Eye Hospital. Ridley introduced Don to his registrar, Montague ('Monty') Ruben, who was later to become head of the renowned contact lens clinic at Moorfields. Ruben warmed to Don and allowed him to sit in on the hospital's contact lens clinics. Don also met Norman Bier at Moorfields and the two became good friends. Bier was an English optometrist and author of one of the earliest contact lens textbooks.²

Don also needed to earn a living, so he applied for a position at Hamblin's famous New Cavendish Street practice. The staff there advised Don that the head of the contact lens clinic—the legendary Josef Dallos³—was a difficult man to work with and rarely employed people, preferring to work alone. Undeterred, Don gained an interview and was offered a job. He found Dallos to be a lovely, warm man and a great teacher; however, working for Dallos posed considerable technical challenges. Although there was a growing trend for scleral lenses to be fabricated from polymethyl methacrylate (PMMA), Dallos preferred to work with glass. Don once told me the story of when he had spent countless hours carefully grinding a glass scleral lens into shape for a patient

1 Batavia is the former name (from 1619 to 1949) of modern Jakarta, Indonesia.

2 The Diploma in Optometry (WA) was run under the auspices of the Western Australian Optometrists Registration Board with significant help from the University of Western Australia. It ran as a three-year part-time course from an initial intake in 1947 (first diplomas conferred early 1951) until completion of its last course at the end of 1968 (last diploma conferred early 1969). Only about 27 optometrists graduated with this diploma.

3 Josef Dallos (1905-1979) was a Jewish Hungarian ophthalmologist, who was the first to mould scleral lenses using Negocol and Hominite and the inventor of lens fenestration (holes). He was one of the most respected figures in the field for his contact lens innovations in the 1930s. Dallos was smuggled out of Hungary by Ida Mann and others and taken to the safety of England in 1937. He practised in London in premises adjoining Hamblins.

and noticed during the fitting visit that there was still slightly too much bearing upon a small region of the sclera. He proceeded to carefully grind just a little more off the lens edge, when all of a sudden the lens totally shattered into tiny fragments, meaning that he had to start all over again. This sort of accident occurred frequently, making glass lens manufacture heartbreaking work.

Dallos taught Don a great deal but two pieces of advice in particular were to have a profound effect on Don's future career. First, never trust the quality and dimensions of lenses made for you by laboratories; if you really care for your patients, you should make your own lenses. Second, undertake research to test your ideas.

During Don's initial interview with Dallos, he was asked if he knew the renowned British ophthalmologist, Professor Dame Ida Mann,⁴ who had migrated to Perth in the early 1950s. Don replied that not only did he know her but Dame Ida was living in the Perth suburb of Dalkeith, where Don also lived. When Don returned to Perth, he called Dame Ida to pass on Dallos's good wishes, and spent many interesting hours speaking with her.

On one occasion, Don told Dame Ida that the annual meeting of the Contact Lens Society of Australia was to be held in Perth and that he was presenting a paper. She asked when and where and to his surprise, she attended. This was at a time when ophthalmologists declined to have anything to do with optometry. Don fondly recalls acknowledging her presence before presenting his paper. Dame Ida died in 1983 and in 2012, Don was invited to London to unveil an English Heritage Blue Plaque⁵ identifying Dame Ida's former place of residence.

After their initial stay in London, Don and Challis travelled around Europe and Don



Don Ezekiel (left) unveiling an English Heritage Blue Plaque (insert image), in September 2012, in Kilburn, London, at the location of the place of residence from 1902–1934 of Professor Dame Ida Mann. Accompanying Don in the unveiling is Jill Mann, whose father-in-law was Dame Ida's brother. Main image and insert image © Neil Handley, BOA Museum/The College of Optometrists, London.

took the opportunity to engage in further networking, meeting up with well-known European practitioners, including Pierre Rocher.

Don returned to Perth and in 1970 established his own practice specialising in contact lenses. The following year he travelled back to London to purchase the machinery required to make his own lenses. By this time, soft contact lenses had arrived on the scene, so Don decided to learn how to fabricate these lenses too. In London, he met George Nissel, a prominent manufacturer of machinery that could be used to fabricate both rigid and soft lenses. He also met up with Philip Cordrey and David Clulow, who owned Contact Lens Manufacturing, which produced Sauflon contact lenses and solutions. Cordrey and Clulow showed Don how to manufacture high water contact lenses and contact lens solutions.

EZEKIEL, THE CONTACT LENS MANUFACTURER

After returning from his second trip to London in 1971, Don started to manufacture contact lenses for his patients. The laboratory was initially called Western Australian

Contact Lens Manufacturing but this was later changed to Gelflex Laboratories. This company also represented Sauflon in Australia.

Soon after the laboratory was established, Gelflex and three other Australian companies received a high court writ from the New York-based National Patent Development Corporation (NPDC), claiming that these companies had infringed a patent owned by NPDC describing the manufacture of a soft lens in a rigid form and then hydrating the rigid form to create a soft lens, which was the process Don was using at Gelflex Laboratories. Two of the companies that received the writ were lens importers and immediately complied by ceasing operation. The third company that received the writ was Sydney-based Corneal Lens Corporation, owned by optometrist Penhryn Thomas.³ Corneal Lens Corporation allowed itself to be acquired by Hydron—a company wholly owned by NPDC—which left Don to defend the writ alone. Many overseas academics and scientists forwarded documents to Don, demonstrating that there was prior knowledge to the art. Don's legal team presented this information to the High Court and nothing further was heard. This was an

4 Professor Ida Mann was a distinguished ophthalmologist, acclaimed for her pioneering research work on embryology and development of the eye. She undertook research that revealed the pathology of mustard gas keratitis, which afflicted soldiers from the First World War some 10 to 15 years after they had survived a mustard gas attack. Although she did not find a cure, Dame Ida found she was able to alleviate symptoms through the use of scleral contact lenses, which was a topic of common interest to her and Don.

5 The English Heritage Blue Plaque scheme was founded in 1866. It commemorates the link between notable figures of the past and the buildings in which they lived and worked.

important early lesson for Don in the murky business of patent protection and litigation and what companies would do to protect their market.

Today, Gelflex Laboratories manufactures soft and rigid lenses. The company also houses Australia's first and only cast moulding facility. Gelflex Laboratories was awarded the West Australian State and Australian National Small Business awards in 1984. The company was acquired by an investment group in 2012, at which time Don retired from contact lens manufacturing.

EZEKIEL, THE CONTACT LENS INNOVATOR

As a skilled practitioner with his own manufacturing laboratory, Don has always been in a unique position to innovate, fabricate lenses and conduct experiments, just as Dallos advised. It is not possible to detail all of Don's inventions, so by way of example I shall highlight three developments of particular interest.

Don presented a paper at the 1983 meeting of the British Contact Lens Association in Harrogate, UK, where he described fitting 43 patients with scleral lenses manufactured from rigid gas permeable (RGP) materials. This was the first time RGP scleral lens fitting had been described. Don suggests that this was not 'rocket science' but a normal progression, as at the time almost all rigid lenses were being fabricated from gas permeable materials, so it was logical that these materials should be used for scleral lenses. Nevertheless, it was an important development because up until this time scleral lenses had been fabricated from glass or PMMA, both of which were impermeable to oxygen. Such lenses could only be worn for four to six hours at a time before hypoxic-induced oedema made lens wear intolerable. RGP scleral lenses represented a significant advance as they allowed greater corneal oxygenation and longer wearing times. Ophthalmologist and co-founder of Polymer Technology Corporation,⁶ Perry Rosenthal, describes Don as the 'father of gas permeable scleral lenses'.

6 Polymer Technology Corporation is a major manufacturer of rigid gas permeable contact lens materials. It is now a subsidiary of Bausch & Lomb, producing rigid lens materials under the Boston brand name.

In the mid-1980s, working with Graham Barrett—then a young registrar in ophthalmology at the Royal Perth Hospital—Don developed what was reputedly the world's first foldable intraocular lens, made from a hydrogel material using techniques adapted from his contact lens manufacturing processes. The key advantage of a foldable intraocular lens is that a much smaller limbal incision is required to insert the lens into the eye. The patent for this development⁴ was licensed to Alcon laboratories.

Don has developed and patented a soft translating bifocal contact lens. All currently available soft bifocal lenses work on the principle of simultaneous distance/near correction, which is a sub-optimal optical compromise. In some respects, Don's invention is a logical extension of what happens with rigid lenses, whereby the lens translates over the cornea, so that the appropriate optical portion of the lens will be positioned in front of the pupil to effect clear near or distance vision; however, translation of the lens is effected by interaction with the lids, and lid-lens interactions are known to be a primary source of contact lens discomfort. Don Ezekiel is an innovator and lateral thinker and apparently has been able to design this lens such that it causes minimal discomfort. Although the original concept was first described 14 years ago,⁵ Don still believes that a disposable form of this lens, which can be mass-manufactured using cast moulding, will become available in the not too distant future. Only time will tell if this eventuates and the lens becomes a market success.

RECOGNITION AND HONOURS

In 1997, Don was made a Member of the Order of Australia (AM) 'in recognition of service to the optometrical profession and to the development of the scleral contact lens'. The International Society of Contact Lens Specialists awarded the Herschel medal to Don in 2005 and bestowed him with honorary life membership in 2012.

One of Don's key interests outside optometry is magic and he has served as President of the Western Australian Magic Society.

Don is now semi-retired and still engages in contact lens consulting. The Ezekiel optometric dynasty now extends to three generations, as Don's son Damon practises optometry in Perth.

Don has been a passionate and innovative contact lens practitioner and manufacturer

and his many contributions have served to enhance the art and science of contact lens practice locally, nationally and internationally. Such is his standing in the field that Don's contributions are referred to in no less than nine pages of Tim Bowden's authoritative tome documenting the history of contact lenses.⁶ Sadly, in this modern world of mass production and global marketing of contact lenses, we are unlikely to benefit in the future from contributions of entrepreneurial individuals of the likes of Donald Ezekiel.

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