CLINICAL AND EXPERIMENTAL
OPTOMETRY

PROFILE

Ernst Goetz 1903–1979

A pioneer of contact lens practice in Australia

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Ernst Goetz (Figure 1) was almost certainly the first Australian optometrist to fit contact lenses and probably was also the first to prescribe and fit telescopic spectacles for low vision patients.

He was born in 1903 in Switzerland in the small village of Hemishofen at the Swiss-German border in the canton of Schaffhausen. He completed an apprenticeship with an optician in Switzerland, which gave him the right to work in the optical industry as an employee but to work on his own he needed a master's certificate in optics. This could be obtained by working for at least two years with a master plus private study and examination or by attending an optometry college for 12 months of full-time study. Ernst decided to study for a year in Jena. This was a good choice because Jena was and still is a renowned centre for optics and had an outstanding optometry college.

Jena is a small city of about 100,000 people located in central Germany, south of Leipzig. It is an old university city; its Friedrich Schiller University was founded 450 years ago, in1558. In the second half of the 19th Century, Jena became the home of two famous optical companies, Carl Zeiss and Schott Jenaer Glasswerke.

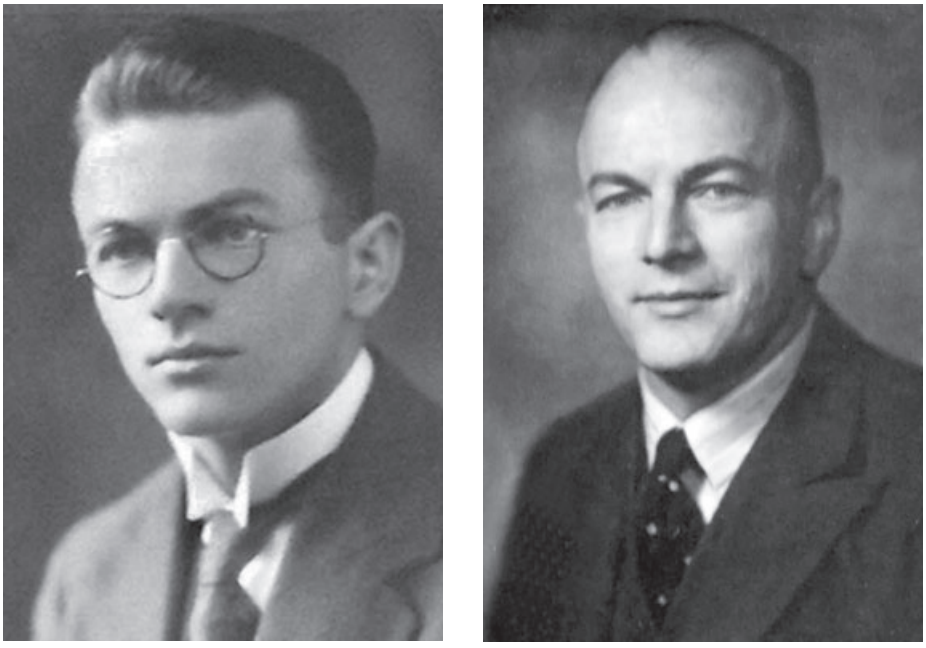
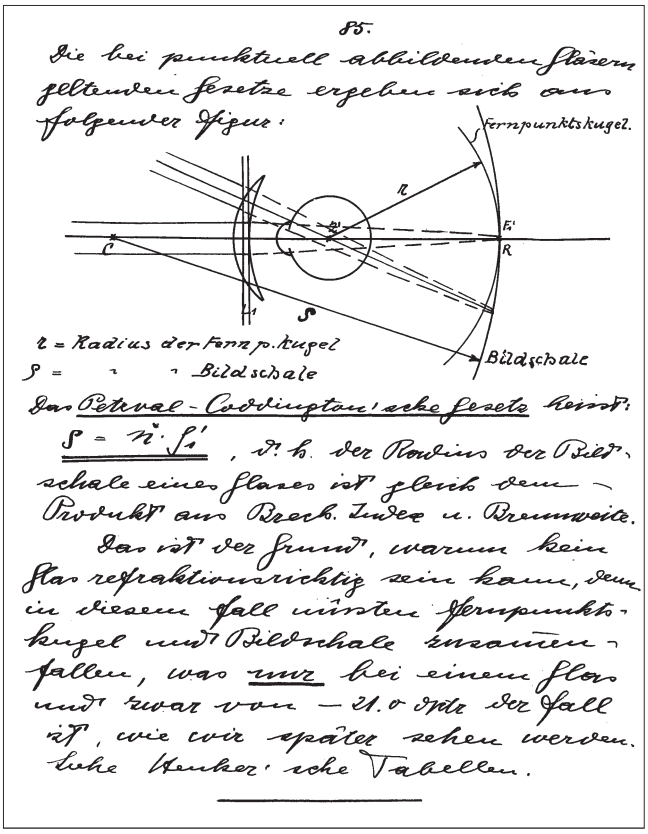


Figure 1. Ernst Goetz when a young man in the 1920s (left) and later in the 1950s (right). Photographs held by the family of Ernst Goetz and reproduced with permission.

Carl Zeiss (1816–1888) started his firm in 1846 for the manufacture of precision instruments.[1] Otto Schott (1851–1935) moved his glass making company to Jena in 1882. He was a chemist and did his doctorate in glass chemistry at the University in Jena. With his scientific approach to making glass, his firm quickly expanded to produce more than 100 different types of commercial and optical glass. The third person who made Jena famous for optics was Ernst Abbé (1840–1905), a lecturer and later professor of physics at the Friedrich Schiller University. He developed a much more scientific approach to the mathematics of optics and the design of optical instruments. His name is connected with the Abbé number of glass, the Abbé sine condition, the refractometer and modern microscopes. He advised the



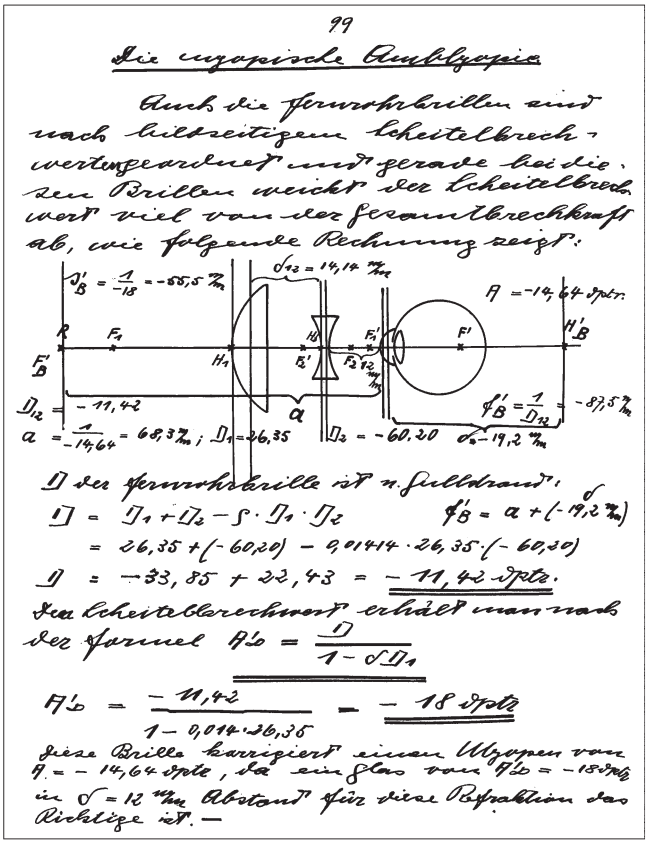


Figure 2. Two pages from Ernst Goetz's note books illustrating the rigour of his course of studies at the Fachschule für Augenoptik in Jena in 1923. Catalogue number 869, Victorian College of Optometry Archive.

Zeiss company and later, in 1885, joined it as its director of research. He was responsible for laying the scientific foundations that made Zeiss such a successful company. The co-operation of Zeiss, Schott and Abbé led to the outstanding development of optical science and instrument design and established the world reputation of the Zeiss company, the university and the city of Jena.

An optometry school was established in Jena in 1918, with the support of the Zeiss company. It is now known as the Fachschule für Augenoptik Hermann Pistor, having been named to honour Professor Pistor, who was its Director from its foundation until 1951. Goetz studied at the school in 1923 and obtained his Masters certificate in optometry and his diplomoptiker in February 1924.

The course was rigorous, as is evident from Goetz's notebooks, which are now held in the archive of the Victorian College of Optometry. His notes are well set out with text, diagrams and calculations, as is illustrated in Figure 2. I would have been happy to have his notes or preferably the knowledge contained in them, when I started lecturing in optics in 1957. The syllabus was extensive: apart from the optometric subjects, it included design of lenses and instruments, basic physics and chemistry. As part of his course, Ernst Goetz built his own microscope (Figure 3), which is now a treasure in the family.

It is very likely that Goetz learned about contact lenses during his studies. Zeiss had been making individually designed contact lenses for ophthalmologists since 1888 and had introduced scleral contact lenses to their product range in 1911. It introduced a contact lens trial set for use in ophthalmic practices in 1912.[2]

Zeiss's interest in contact lenses came about because Dr Eugen Fick, regarded by many as the inventor of contact lenses,[3] asked Carl Zeiss if contact lenses could be ground to the required curves. The first contact lenses were blown glass and used for cosmetic purposes: they did not have sufficiently good optical quality for optical correction. The project was given to Moritz von Rohr, a researcher at the Jena University, who had done extensive research in lens design. His series of best form lenses was marketed by Zeiss under the name of 'Punctal'. He designed the haptic glass lenses, which were used on an experimental basis by some selected practitioners. In 1892, Dr Sulcer of Zurich reported that he had fitted some patients with ground glass lenses made in Jena.[2]

Ernst Goetz was in Jena at the time when Zeiss greatly extended its ophthalmic lens department and he was able to follow all

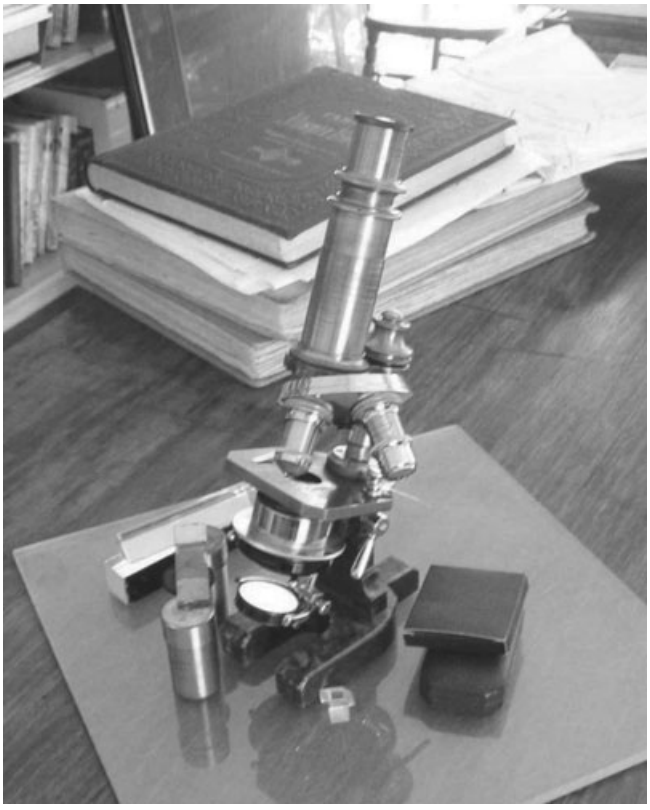


Figure 3. Microscope built by Ernst Goetz during his student days. Held by the Goetz family.

the new advances in optical and optometric practice. It was an exciting place to be but he felt lonely away from his family and he did not want to settle in Jena. His girlfriend had migrated to Australia and when he learned that Zeiss was looking for a representative in Australia, he took the position and came to Melbourne in 1924. At the start, he promoted the telescopic and microscopic spectacles Zeiss had developed. This gave him a lot of contacts with ophthalmologists and the medical profession. Soon he was regarded as an expert in subnormal vision and had patients referred to him. One of the four patient record books[4] held in the archive of the Victorian College of Optometry records Goetz's examination and treatment of low vision patients using telescopic spectacles and high additions. The first record in one of these books is dated 1 July 1926. It may be that Goetz was the first Australian optometrist to practise in the field of low vision.

In 1926, he joined the firm of Alfred Nott as an optometrist. This company had been established in 1896 in Collins Street in the centre of the Melbourne business district and was very well regarded. The firm advertised in the newsletter of the Melbourne Philharmonic Society in 1911 its appointment as optician to His Excellency Sir Thos Gibson-Carmichael KCMG, Governor of Victoria. Goetz was employed by Alfred Nott because two optometrists resigned to start their own practice, Coles and Garrard, which was to become the largest optometric firm in Melbourne. The good reputation of Alfred Nott is illustrated by the fact that Coles and Garrard advertised on the front page of the 7 February issue of the Melbourne *Sun News-Pictorial* that they were 'previous of Alfred Nott'.

There was no impediment to Goetz practising as an optometrist even though he lacked the usual formal qualification of Fellowship of the Victorian Optical Association or one of the British optometric qualifications because there was no regulation of the practice of optometry in Victoria at the time. Anyone could practise optometry. Legislation for the registration of optometrists was not enacted until 1935, however, when registration was introduced, his qualifications and experience were recognised under Section 8 of the act, which enabled registration of those already in practice and who were suitably experienced. A summary of the first applicants for registration[5] under the newly enacted Opticians Registration Act 1935 records Goetz as practising optometry as his sole occupation at A Nott Pty Ltd and as having the qualifications of 'Diploma of School of Opts Jena and Masters Cert Jena'. He was registered to practise optometry in Victoria on August 24 1936 and granted certificate number 73.[6]

When Alfred Nott died in1941, Ernst Goetz and Stuart Harvey bought the practice. Harvey died in 1968 and Goetz took over the sole management of Alfred Nott Pty Ltd Optometrists and Dispensing Opticians. His son worked in the practice as a dispenser, training under the guidance of his father.

We do not know exactly when Goetz first fitted contact lenses in Australia. It may have been in 1925 or 1926 but several of his patient record books[4] show he fitted contact lenses to patients referred to him by ophthalmologists in 1930 (Figure 4). As the results of some of his contact lens fittings became known, especially those for patients with keratoconus or after corneal surgery, he received many referrals not only from Melbourne but also from country Victoria and from interstate. His records show some remarkable corrections, for example:

Miss L fitted in 1932

Spectacle correction: R -5.50/+8.00 × 180, 3/6; L -3.00/+3.50 × 172, 5/6.

Contact lenses were fitted with powers R -1.50 D and L -0.50 D, giving VA R3/6, L5/6.

Figure 4. Some of the haptic lenses fitted by Ernst Goetz. Held by the Goetz family and kindly made available for photographing.

With the left lens, all day wear was achieved. Maximum wear with the right lens was three to four hours.

The patient alternated contact lens wear and spectacle wear.

Mr H fitted in 1934

R -11.00 × 150, 3/6; L -5.00/-5.00 × 90, 4/6.

Sclera radius R and L 12.00 mm.

Corneal radius 8.0 mm.

Overall diameter 20 mm.

Power + 2.50 D.

Wearing time 10 hours.

Mrs C first seen in 1932

Reported to have worn contact lenses for last 10 years at present R -21.00 D, L -25.00 D.

Fitted glass lenses, oval with sclera radii of 11.50 and 10.50, R and L -4.50 D.

1943: developing cataract in the right eye, refitted with sclera radii of 12 mm and 11 mm.

Power -8.00 D.

1948: fitted plastic lenses radii 13.0 and 10.00 mm.

Power -9.00 D, 4/6.

1951: after corneal graft, spectacle correction R -0.50/ +3.00 × 160, 5/6 and L balance lens.

His clinical records show a great number of very interesting fittings. The above cases are examples of haptic fittings. With the development of corneal lenses he used fewer haptic lenses.

Ernst Goetz went to Europe in 1936 to study the latest developments in contact lenses and things were certainly changing. While most of the lenses Goetz used were based on the original Zeiss lenses, improvements suggested by Josef Dallos, an ophthalmologist from Budapest, led to a joint patent between Zeiss and Dallos.[7] Dallos also developed the moulding technique to obtain the exact shape of the sclera from living eyes. Dallos and his brother-in-law George Nissel, who manufactured the lenses, moved from Hungary to England in 1937. Before setting up the first contact lens only centre, Dallos fitted patients at Moorfields between 1938 and 1948. The corneal lenses developed by Tuohy appeared in 1947 and PMMA and other new materials became available. Both haptic and corneal lenses were used mostly for cosmetic purposes.[8] The British Contact Lens Society was formed 1946 and held examination for Fellowships. Also in 1946, G Nissel and Co in London started to manufacture glass and plastic contact lenses and produced lathes and polishing machines designed for contact lenses.

On his return to Australia, Goetz was featured fitting 'the new wonder glasses' to a patient in a Movietone newsreel, then shown in all picture theatres as a prelude to the main feature films. His records show an increase in patient numbers for contact lens fittings after this.

With the development of acrylic materials, Theodore Obrig in New York manufactured plastic contact lenses in 1936. New plastic materials became available that made it possible to turn lenses from plastic buttons on a simple watchmaker's lathe and they became more popular than glass lenses. With these new developments and because of the 1939–1945 war in Europe, Zeiss discontinued contact lens manufacture in 1940. Ernst Goetz then used Obrig of New York as supplier for his lenses until G Nissel of London formed an associated company in Melbourne in 1952, which was later taken over by Vic Lowe. They became the main supplier of custom-made lenses in Australia.

Ernst Goetz showed his interest in the profession by making presentations at the monthly lecture series of the Victorian Optical Association in the 1930s[9] and in the post-graduate lecture series of the Australian College of Optometry (now Victorian College of Optometry) in the 1940s.[10] At the postgraduate series in 1947, he presented two lectures on vertex refraction and a lecture on contact lenses, at which he presented a film produced by the London Refraction Hospital. In 1949, he presented a lecture on the optical properties and application of bifocals; in 1952, he gave a series of lectures on contact lenses with John Strachan.

At the end of the Second World War, several young Australian optometrists went to London to take the examina-

tions for the British Optical Association Diploma of Contact Lens Practice and the field of contact lens practice expanded. Among them was John Strachan, who assumed the mantle of the leading contact lens specialist in Victoria in the mid-1950s. Penrhyn Thomas in Sydney obtained the 1942 book written by Theo Obrig and used it as a basis to establish a laboratory to manufacture contact lenses.[11] He fitted his first moulded haptic lens in 1942. In the early 1950s, there were several practitioners pioneering the fitting of corneal lenses. In Melbourne, we had Ernst Goetz, John Strachan and Bill Swinnerton, while Sydney had Pen Thomas and Lloyd Hewett. In 1939 OPSM brought out a young English optometrist, Ken Iredale, who made the first contact lens for OPSM in that year.[12] They became the next generation of pioneers. They developed their own best-form lenses trying to stabilise the lens without upsetting corneal physiology. Variations in lens size, edge lift, fenestration and limbal curves became guarded secrets.

Contact lenses became part of the optometry syllabus and began to enter the mainstream of optometric practice with the appointment of part-time lecturers Penrhyn Thomas at the University of Technology in Sydney in 1948 and John Strachan at the Victorian College of Optometry in Melbourne in 1954. When I graduated in 1955, we had a very limited knowledge of contact lenses. Pen Thomas started the Corneal Lens Corporation to manufacture and supply contact lenses and lectured extensively to optometrists and ophthalmologists around Australia about contact lens fitting and promoting his new lens designs. I was fortunate to attend one of his weekend courses and later spend time in his practice. This gave me the confidence to fit contact lenses. There would be many optometrists who had qualified before 1960 who similarly benefited from Penrhyn Thomas's entrepreneurial endeavours. We owe a debt to Penrhyn Thomas, John Strachan, Lloyd Hewett and others who with enthusiasm and ingenuity laid the foundations for contact lens practice to become a part of mainstream optometry in the 1950s and 1960s. We have to admire Ernst Goetz for his boldness in being the first Australian optometrist to fit contact lenses about 20 years earlier.

ACKNOWLEDGEMENTS

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