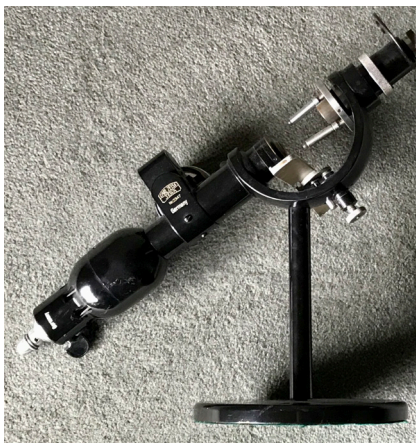
RANZCO Museum

The Humble Focimeter

The history of lens power measurement dates from Snellen who designed a phakometer in 1876. This was a series of lenses arranged like an optical bench. It was useful but could only measure convex lenses. Troppman developed a focimeter in 1912 which allowed a direct reading of dioptric power, lit by an indirect mirror, and refined with an electric lamp. In 1915, Busch introduced the model based on an astronomical telescope and a closed ring target with a green filter. Henker subsequently developed the ring target of green dots that is still in use. The mid 20s saw Zeiss Jena produce their first model at the same time as the American Optical Company. The term focimeter is generic to all models but Vertometer and Lensometer are brand names.

Before the development of the optical focimeter, most opticians used the lens measure (also known as a 'spherometer' and, more recently, by some suppliers as a 'lens clock'). It was a hand-held device like a pocket watch with a prong to press against the lens, offsetting a pointer that was read against a round scale. As the prescription of a lens depends upon the shape of both front and back surfaces, more than one measurement was required. Lens measures were adequate for most bi-convex or bi-concave lenses as used up until the turn of the twentieth century, but were neither very accurate nor robust and required frequent calibration. Larger bench-mounted models also existed.



1930 Zeiss Focimeter

This focimeter, recently acquired by the Museum, produced by Carl Zeiss Jena, dates from an early 1930 design. It was used by Dr Fred Fenton, a Melbourne ophthalmologist. In 1950, he became senior ophthalmic surgeon at the Royal Victorian Eye and Ear Hospital and on his retirement was appointed consulting surgeon emeritus. While at the hospital, he was chairman of the honorary medical staff from 1955 to 1963. He took a special interest in orthoptics. He was chair of the Orthoptic Board of Australia from 1948-1964, and served as a member of the Board of the Ophthalmic Research Institute of Australia from 1960-1968. He continued to maintain a lively interest in all the latest advances in ophthalmology and had no hesitation in suggesting relatively new procedures and treatments, if he thought that they were in the patient's best interests.

As a young man, he was an almost obsessive skier. He was one of the first to climb the southeast face of Mount Kosciusko and did it in winter with primitive equipment. In 1928, he entered a downhill race for novices in Switzerland. While the other competitors carefully executed measures traversing the approaches, he set forth hurriedly, pointing his skis straight down the slope and to everyone's astonishment, arrived without mishap, an easy winner.

65 years ago

Luft reported regression of proliferative diabetic retinopathy (PDR) after post-partum pituitary necrosis. This led to a surge in interest, with over 400 cases of hypophysectomy by various methods in the following 10 years. Used in limited cases, success was achieved with 30% in one series. The treatment was invasive with a high morbidity.

Gerd Meyer-Schwickerath, the father of photocoagulation

At this time, Meyer-Schwickerath in Essen had developed the Xenon photocoagulator. Producing large burns, regression of PDR was induced. This treatment was based on observing a patient who did not develop proliferative lesions in an eye with large choroidal scars. The long term outcomes of photocoagulation in PDR were reported in 1979 vindicating the treatment. However, complications occurred, with intense retinal burns, resulting in scarring. Difficulties with night vision were caused by peripheral visual field defects. Any vitreous hemorrhage absorbed heat and made fundus visualisation difficult.

Maiman in California built the first working prototype laser in 1960 using a ruby rod wrapped in silver. 1964 saw the first CO^2 laser. At that time, YAG and green Argon lasers were developed. Early models were bulky and required water cooling systems. Compact diode lasers became available in the 1980's.

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