Did T. R. Procter Bring Modern Optometry to New Zealand and Australia? An Investigation through Archival Newspapers

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ABSTRACT

Thomas Robert Procter (1826-1905) immigrated to Australia in 1849 and in the course of a chequered career as a metalworker, gold prospector, silversmith and jeweler, became a well-known sight-testing optician in Australia and New Zealand, although he is not well remembered today. Interest in him was piqued recently through the acquisition by the Kett Optometry Museum of a classy spectacle case bearing his name and the location of his practice in Melbourne, Australia. We were able to date the case as being made about 1890. Initial research using two contemporaneous biographies and a 20 page promotional 'treatise' written by Procter suggested that he was well-versed in the techniques and the science of modern optometry that had emerged during the second half of the 19th century. He returned to England in 1857 reportedly to study "diseases of the eye". He left England in 1861, this time arriving in New Zealand, where he made a name for himself as an optician before returning to Australia in 1888. More exhaustive research confirms the view that he was the first sight testing and manufacturing optician in New Zealand, and among the first when he came again to Australia in 1888. He mentored two New Zealand opticians who migrated to Australia in the 1880s who had a significant impact on the emergence of professional optometry in Australia. However, it was also found that Thomas Procter cannot be given sole credit for being the first to practice 'modern' optometry in New Zealand. A good deal of the credit must be accorded to William Pugh, a London trained optician who came to New Zealand about 1875 and was employed by Procter. He may have also been the person who taught Procter about 'modern' optometry and who trained the two New Zealanders who came to Australia.

The Kett Optometry Museum bought an elegant spectacle case in December 2014 to add to its collection, it is a lozenge shaped snap spectacle case, 120 x 55 mm, made of wood covered in black leatherette, with gold edging and gold stamped with the British coat of arms above a cartouche enclosing the name of the supplying optometrist, T. R. Procter of Melbourne (Figure 1). The case can be dated about 1890 because we know Procter (Figure 2) had emigrated from New Zealand to Australia in 1888[1] to set up as an optician in Melbourne and that he died in 1905.[2]

The spectacle case is just a spectacle case, albeit a classy one dating from the late 19th century, but it turns out it has a story. It is possible that Procter was the man who brought ‘modern’ optometry to New Zealand and was among the first in Australia. This article explores that possibility.

Procter describes himself on the spectacle case as an oculist optician. Not too much should be read into that: there is no evidence that Procter had medical qualifications and it was not uncommon in 19th century Australia for opticians to claim to be oculists, sometimes with an apostrophe (oculists’ optician) suggesting they dispensed oculists prescriptions, but often without the apostrophe suggesting something else entirely.[3] Procter uses the designation ‘oculist’ without the possessive, so we can sense that Procter wanted it known that he was more than a spectacle maker or seller.

Figure 1. Spectacle case of T. R. Procter, oculist and optician of Melbourne, Australia c 1890.
Kett Optometry Museum. Cat No. 2773.

This becomes abundantly clear on looking at a promotional ‘treatise’ written by him titled “*Optical Diseases of the eye and their results”,*[4] a copy of which is held by the Kett Optometry Museum. The front cover proclaims the author is an *“Oculist, Optician and Scientific Ophthalmologist*”, an even more grandiloquent characterization of his occupation. Of course, the nomenclature of the ophthalmic professions was not settled in the 19th century, but Procter seems very intent on claiming the widest scope of expertise.

Figure 2. Thomas R. Procter, oculist, optician and scientific ophthalmologist of Melbourne, Australia, about 1890. Sourced from Cyclopedia of Victoria 1904. (Photo: Johnstone O’Shannessy and Co.)

The treatise is undated, but it was printed in 1888, the year Procter moved to Melbourne since he was advertising its availability in February of that year[5] (Figure 3). There was a precursor, a pamphlet, published in 1883,[6] and a 16-page treatise[7] was published in 1886 when Procter was in New Zealand. The 1888 edition held by the Kett Optometry Museum records it was printed in Melbourne and it bears Procter's Melbourne address so it is an edition especially published on his arrival in Australia.

WEAK EYES.

A Treatise on the Optical Diseases of the Eye and their Results, the Use of Spectacles and the Mode of Manufacture, Anatomy and Physiology of the Eye, the Cause of Deafness, by T. R. PROCTER, Oculist Optician, 7 Burlington Terrace, East Melbourne. Free by applying to T. R. PROCTER, now at the Club hotel, Lydiard street, Ballarat; or Mr J. L. REEVES, Bookseller, 75 Sturt street, Ballarat.—[ADVT.]

Figure 3. T. R. Procter advertised his treatise in The Star (Ballarat, Australia) on February 8 1888, the year he returned to Australia to set up practice as an oculist optician in Melbourne, Australia.

What does this treatise tell us about Procter? It is quite a substantial work for a promotional booklet. It is 20 pages of tightly packed text within paper covers and has 20 illustrations throughout the text. It is promotional with testimonials and favorable newspaper articles reproduced on the inside pages of the covers. An advertisement for T. R. Procter Oculists' Optician on the back cover states "*The Author of this work may be consulted on all cases of Impaired Vision, Inflammation of the Eyes, or Granular Lids and for the Proper Adjustment of Spectacles*", yet another claim for a wide scope of expertise. The emphasis in the treatise is on refractive errors and their correction, but later he expanded his scope of practice to include supplying an eye ointment, advertised as "*Procter's Universal Eye Ointment, a salve to cure blight, sore and inflamed eyes, granular lids and ulceration of the eyeball*".[8]

The booklet is well written and is basically sound except for the claim that deafness is associated with astigmatism (p 6) and inflated claims that not wearing appropriate spectacles can cause blindness (p 9).

It covers the basic anatomy of the eye and orbit, and ocular accommodation. It gives a good account of the refractive errors including astigmatism and presbyopia. It dwells on the inadequacy of purchasing ready-made spectacles and the need to measure refractive errors for each eye separately. It touches on eye muscle disorders, strabismus and nystagmus. The use of prism to correct eye muscle defects is mentioned. The closing pages deal with the making of spectacle lenses and the qualities of good spectacle lenses including the importance of correctly locating the optical centers of the lenses. Photophobia, tinted lenses, and side shields are discussed and alternative types of spectacles and other visual aids are described and illustrated.

There is no specific account of his methods of sight testing or of the equipment he used but the astigmatism fan test is illustrated and described (p 6), as is the Snellen letter chart. Procter may have been in no hurry to reveal all his secrets by detailing his test methods.

What impresses is that he refers to the writings of noted authorities of his time, quoting from some and even giving the page numbers of the quotes. He alludes to William McKenzie's *A Practical Treatise on the Diseases of the Eye* (4th edition 1854) and to Soelberg Wells *On long, short, and weak sight, and their treatment by the scientific use of spectacles of 1862*, a well-received book that anticipated much of what Donders would write in his seminal book of 1864, to which Procter also refers.

HOW DID PROCTER ACQUIRE HIS KNOWLEDGE OF MODERN OPTOMETRY?

The knowledge and techniques underpinning modern optometry were well established by 1888 when Procter wrote his treatise: astigmatism had been measured and corrected in 1825, the ophthalmoscope was invented in 1851, Snellen devised his letter chart in 1862, Donders published his seminal book in 1864, the astigmatism fan and clock test was devised in 1868 and the retinoscope was in use by 1880. Von Graefe, Chavasse, Stevens, Worth, and Maddox were beginning to unravel strabismus and heterophoria.

In the 1880s all this new knowledge began to filter to the business of sight testing and providing spectacles tailor-made to meet the visual needs of individual patients. The first 'modern optometry' books began to be published at that time, in particular the books of Gustavus Hartridge (1884), Charles Prentice (1886), William Bohne (1888) and C. H. Brown (1901).

Procter's treatise, published in 1888 with earlier versions in 1883 and 1886, suggests he was an early adopter of the new knowledge of ophthalmic science in its application to prescribing and making spectacles. How did he acquire his knowledge of modern optometry when living in New Zealand, a colonial outpost of Britain with a population of 80,000 people, that was a very long way from everywhere else?

He may have been self-taught. His references to key books in his treatise suggest he may have been a reader and he also alludes in his treatise (p 10) to learning systematically, by arrangement, with unnamed 'parties'. However, he says that he was the only "practical optician in New Zealand", and if this is so, it is not clear who might have been his tutors. It may have been a London trained optician whom Procter employed, but more of that later in this article.

In his 1888 treatise Procter claims (p 10) to have had 30 years of experience "in the optical business" during which time he has made "the adaptation of spectacles an especial study" and says he had examined the eyes of thousands of people. He makes the same claim of 30 years' experience in an advertisement published 10 years earlier in 1878[9] (See Figure 4).

His claim of 30 years-experience is doubtful. Thirty years takes us back to 1848 from the date the claim was first made. He was on his way to Australia from England in that year. He departed Cornwall in England for Australia in 1848, arriving at Adelaide, in the British colony of South Australia, on January 6 1849, with his widowed mother and three siblings.[10] He was 21 years of age. He was not an optician then.

His intent in coming to Australia was to get employment in the copper mining industry. He had an engineering background having been taught mechanical skills and metallurgical assaying by his grandfather, Robert Malachy, a mining agent, and having worked in Pope's dockyard in Plymouth.[11] Cornwall was long famed for the mining of its rich mineral resources but the industry was in decline in the middle of the 19th century causing many Cornish miners to emigrate to mining districts overseas where their skills were in demand. The Procter family journeyed to the colony of South Australia where copper mining was booming: by 1850, South Australia was the third largest copper producer in the world.[12]

However, another kind of mining soon caught the attention of young Thomas Procter. Gold was discovered in the neighboring colony of Victoria in July 1851 and Procter promptly travelled there in search of his fortune. He had some success in his quest for gold[1, 11] but he turned to business as a goldsmith, jeweler and watchmaker in June 1853 in the goldfields township of Ballarat.[13] His business was in a tent on Bakery Hill marked out by a red flag, which was not uncommon accommodation for traders on the gold fields at that time. His claim to be a silversmith and jeweler seems well founded enough. He is reported to have been commissioned to make some fine silver pieces during his time in Ballarat, including a gold cup for the gold diggers to present to a friendly Gold Commissioner, Gilbert Amos in 1854, and a gold mounted whip as a racing trophy.[1]

His advertisements back in the mid-1850s make no mention of supplying glasses or examining eyes. He was a prolific advertiser of his businesses, and was often in the news for one reason or another, but he is invariably identified as a jeweler and watchmaker, and sometimes as a silversmith or goldsmith. On the other hand, an article entitled "*An eminent oculist and optician. Personal reminiscences*" published in Table Talk in 1905 reports that he had practiced as an optician in the Bakery Hill business[11] but this article would have relied on Procter's recollections in the last year of his life, and in the absence of corroborative evidence this particular recollection is unlikely to be true.

He advertised sight testing and made to order spectacles for the first time in January 1877, by which time he was in New Zealand. In this advertisement he invited the public to "take the opportunity of calling on T. R. P. where they can have their sight gauged" and alludes to having Dr. ACKLAND'S OPTOMETER for this purpose[14, 15] (Figure 4). These first advertisements for sight testing were still under the banner of "Watchmaker & Jeweller" but within a few months he began advertising what he called the spectacle branch of his business.[16] In the following year he advertised himself as an optician for the first time[9] (Figure 5). In the 1880s Procter begins to advertise himself variously as Oculists' Optician, Oculist's Optician and Oculist Optician.[17] It seems he was an optician from 1877.

When Procter came to Melbourne in 1888, a claim of 10 years-experience as an optician would have been more reasonable than 30 years.

DID PROCTER STUDY THE "OPTICAL DISEASES OF THE EYE" IN LONDON?

Procter returned to England in 1857 and lived in London for four years. He may have learned about modern optometry during that time. It is reported in his biographies[1,11] this is what he did but confirmation is necessary because these sources would have relied on Procter as the sole source of the information.

Procter advertised his Ballarat business for sale in 1856,[18] saying the reason for its sale was his intention to return to England. The year he actually left Australia is uncertain but is probably 1857. However, he was certainly in London in 1861. According to the 1861 UK census he was living in Upper Charles Street, Clerkenwell, London, married, with a 10-year old son, John. Procter's occupation is given as goldsmith.[19]

The declared purpose of his journey to England in his biographies was to "engage in a course of medical studies to extend his knowledge of diseases of the eye."[1, 11] He may have done so since Clerkenwell was a center of the optical trades, as well as for jewelry and watchmaking, and the already famous Moorfields Eye Hospital was, at the time, only a short walk from the center of Clerkenwell. There were also a number of eminent opticians in London from whom he could have obtained tuition and training as an optician, most notably Dollonds, a highly regarded firm of opticians and instrument makers founded in 1750 that numbered the crowned heads of Europe among its clients. While there were opportunities for Thomas Procter to embark on his planned studies, there were no optometry courses: they did not come into being until the late 1880s and 1890s.

Procter's time in London is shrouded in mystery. One of his biographies reports that he had opened a business in London for the manufacture of jewelry and scientific instruments, especially the manufacture of optical appliances, but why then did he give his occupation in the 1861 UK census as goldsmith rather than optician or instrument maker? Another curious event is that he travelled back to Australia in May 1859 without his family and returned to London in December.[20] This interlude would have taken him from any business he was running in London for the better part of 12 months, including 6 months at sea, not a journey to be undertaken lightly. However, as testament to his entrepreneurial character, just prior to leaving Australia in December 1859 to return to England he advertised that he was a practical engineer and was taking orders on commission for "all kinds of equipment and mining plant" that he would source in England.[21] He was a man of many parts, seemingly always with an eye to the next opportunity.

No evidence has been uncovered to show that Procter did undertake studies in optics or diseases of the eye while he was in London. None of his advertisements, nor his treatise and biographies, make specific comment about the nature of any London studies, and he was not a man to hide his light under a bushel. Had he completed studies or received tutelage from anyone of note, we would have been told of it.

Procter left England for Australia in 1861 but finished up in New Zealand. Had he trained as an optician in London, it might be expected he would commence practice as such on his arrival in New Zealand. For 16 years his advertising in Zealand was as a jeweler and watchmaker. He did not claim he was an optician until 1878.[9]

It seems unlikely that he trained as an optician while he was in London, as he claimed.

Special Advertisements.

T. R. PROCTER,

WATCHMAKER & JEWELLER,

REVELL STREET, HOKITIKA.

AND

HIGH STREET, CHRISTCHURCH.

The near-sighted, and those suffering from weak eyes, requiring spectacles, should take this opportunity of calling upon T. R. P., where they can have their sight guaged and registered so that they can, at any future time, be supplied with suitable spectacles on application through the post.

T. R. P., having had thirty years experience in dealing with spectacles, and knowing the difficulty there has been in procuring the same, of reliable material properly adjusted to the sight, has secured the services of a first-class and thoroughly qualified optician (late of Dollond's, London), and the only practical optician in New Zealand, can quarantee to supply spectacles in any description of frame, suited to any sight of the very best Brazilian pebbles or the patent tinted, or other glasses All kinds of optical instruments and lenses of every description made to order.

N.B.—T. R. P. begs to inform the inhabitants of Hokitika and the surrounding districts, that he has received from the Christchurch establishment, for a few days only,

DR ACKLAND'S OPTOMETER,

for guaging the sight.

☞ AN EARLY CALL REQUESTED.

T. R. PROCTER, Optician, Christchurch, may be consulted at the Grosvenor Hotel till THURSDAY at noon.

T. R. PROCTER having made the disease of the eye, for the adaption of Spectacles, an especial study, and during 30 years experience in the Optical branch of his business, knowing the difficulty there has been in procuring the imported article of reliable material properly adjusted to the sight, and having also secured the services of a thoroughly qualified Optician (late of Dollond and Sons, London), and the only PRACTICAL OPTICIAN in New Zealand, is now prepared to supply a want long felt amongst the community, viz., the proper treatment of that most delicate of organs, THE EYE. Where the sight is either naturally defective, or impaired by accident, over-work, or age, T. R. Procter guarantees to supply GLASSES TO SUIT ALL SIGHTS, of the best Brazilian Pebbles, or the patent Tinted or other Crystals, selected with care and judgment, so as not only to overcome the inconvenience of defective sight, but to preserve, as long as possible, the strength of the eye.

Next to the proper selection of the glasses it is a matter of the greatest importance that the frames should accurately fit the face of the wearer. The majority of people fail to notice the importance of having such an important organ as the eye accurately measured and fitted; yet persons who would never dream of purchasing a pair of ready made boots, or of putting on a suit of slop-clothes, do not hesitate about taking the first pair of spectacles that are given to them from the stores of top merchants and other dealers who dabble in Optical goods, who, they must know, if they gave a moments thought to the matter, have no pretensions to Optical knowledge.

Every Optician must have met with a middle-aged housekeeper who has adapted a pair of her aged master's cast off spectacles, or a needy clerk who has secured, as he thinks, "a great bargain" at a pawnbroker's, and both of these types wonder why their eyes are fatigued, and the sight deteriorated since they began to wear such glasses.

Persons suffering from weak and imperfect vision should take the opportunity of calling upon T. R. Procter, when they can have their sight guaged and registered by specially prepared instruments, and a patent Optometer, for carefully testing the sight, so that they can at any time be supplied by post.

To Medical and Scientific Gentlemen: T. R. Procter has brought with him a first-class Misroscope for Sale. 3de

Figure 4. T. R. Procter advertised spectacles with made to order lenses and sight testing for the first time in 1877. Advertisement for T. R. Procter, Watchmaker and Jeweler. West Coast Times (New Zealand). January 2 1877.

Figure 5. T. R. Procter identifies himself personally as an optician for the first time in 1878. Timaru Herald (New Zealand), December 4 1878]

PROCTER RETURNS TO THE ANTIPODES

Procter left England for the Australia on October 1 1861, arriving in Melbourne on December 22.[22] There he must have learned of the gold rush in the province of Otago in the south island of New Zealand. It had burst on the scene late in 1861. He set sail for Port Otago, near Dunedin, arriving in March 1862.[23] It seems that he was again in the pursuit of fortune as a gold prospector or as a merchant trading with the miners, as he did in the 1850s when he was in Australia.

He was soon back in business as a watchmaker and jeweler, firstly in Dunedin in 1862,[23] and later setting up business in Queenstown on Lake Wakatipu in May 1863.[24] His advertisements rarely make mention of spectacles.[25] In a burst of advertisements in 1863 he states that he has available "spectacles for all ages" but there is no further mention of spectacles until the appearance of a few advertisements in February 1875 for "real Brazilian pebble spectacles". It seems he is not yet a sight-testing optician or even a regular spectacle seller.

He nonetheless kept himself busy for the next 15 years. He opened and closed shops in various New Zealand towns before settling his main place of business in Christchurch in October 1873.[26] He continued to travel to other towns, some quite far afield despite the arduous nature and hazards of such journeys. In 1876, the Patea Mail reported that T. R. Procter, jeweler of Christchurch, fell from his horse when travelling to Opunake dislocating his shoulder and requiring the attendance of a Dr. Walker so he could continue his journey.[27]

News and advertisements in local newspapers tell us that Procter also had an eye for the business of gold mining. He advertised his services for gold smelting and refining. He took up a lease for gold mining in 1864, called for tenders to sink a mine shaft, another to remove a boiler and he bought a pump and winding gear from a discontinued mine. He applied for a patent for a gold washing cradle and then endeavored to sell the rights to it.

He was also a lively figure in society providing a demonstration of magnetism and electricity after a concert and some years later he held public exhibitions of a camera obscura. In 1867 he ran an Art Union raffle of 1000 tickets at £1 each, with most of the prizes drawn from his own merchandise. He joined the United Grand Lodge of English Freemasons in 1871.

He was in the news because of the transit of Venus of 1874, which could be observed in New Zealand. His biographies have him engaged in the adjustment and repair of the instruments of the official observing party in Christchurch that included Major Henry Palmer, the head of the observation party, and Captain Charles Darwin, the son of the famous evolutionist.[1, 11] Newspaper reports paint a different picture.[28] Procter accommodated an unofficial observation in his backyard in the town Hokitika, on the west coast of New Zealand, for which he supplied the chronometers and was one of the timekeepers. His unofficial site was blessed with good weather and a clear view of the transit, while the official observations elsewhere in New Zealand failed because of poor weather. It is not certain whether Procter's unofficial party provided observations of any value. The newspaper report suggests that Procter had not set his chronometers with sufficient accuracy.

PROCTER BECOMES AN OPTICIAN

Procter advertised spectacles and sight testing for the first time in January 1877 (Figure 4). The same advertisement also tells us that Procter had secured "the services of a first class and thoroughly qualified optician (late of Dollond's London) and the only practical optician in New Zealand". He also advises that he has a Dr. Ackland's optometer for "gauging the sight."[15]

Procter was ahead of Australia in his acquisition of an optometer. The first advertisement in Australia for sight testing using an optometer appeared in 1882,[29] a claim that was advertised by Australian opticians with increasing frequency over the next decade. Not that the optometer was a recent invention: Porterfield invented it in 1738. In a later advertisement in 1881 Procter advises he has "various mechanical contrivances and instruments, which suit what is known as Donders' system"[30] suggesting that he has added to his sight testing armamentarium.

In 1877, Procter had established a workshop for grinding and polishing lenses and fitting them to spectacle frames, no doubt made possible by the "thoroughly qualified optician" he had employed. He invited the press to visit the new workshop and an article about it appeared in a local newspaper in October 1877.[31] The article reports that Procter showed the journalist his optometer and gave an account of its virtues and then showed his marble jewelry before introducing "the optician". The optician remains anonymous, but took the journalist through the processes of grinding lenses to their desired optical power and fitting them to spectacle frames. The optician is described as "a most communicative and agreeable gentleman" but that is all we learn about him until later.

The lens grinding workshop and the optometer enabled Procter to provide made-to-measure glasses. In the article in *The Press* he asserts he is the only person in New Zealand able to do so.[31] A year and bit later, Procter is advertising himself as an optician[9] (Figure 4).

Within another two years, in 1881, he advertises correction of astigmatism with cylindrical lenses.[32] His workshop could now grind cylindrical lenses and was presumably able to fit the lenses to a spectacle frame with the axis of the cylindrical lens at the correct orientation. This time he is not ahead of Australia: he was narrowly beaten by Charles Sawtell, practical optician in Adelaide, South Australia, who advertised astigmatic spectacles a year earlier, in 1880.[33]

Not that astigmatic spectacles were new. Thomas Young measured his own astigmatism in 1793 and the British Astronomer Royal, George Airy, measured his astigmatism and had a lens made to correct it in 1825. A number of lens makers in Britain, USA and France were making cylindrical lenses soon after.[3]

What was new was bringing made-to-measure spectacles to the market place that could precisely correct refractive errors. This occurred through a convergence of advances in the science of optics in the 18th century, in ophthalmic science in the 19th century, and in the slow evolution of the craft spectacle lens making over the 600 years since spectacles were first devised in the late 13th century. Procter and his anonymous 'optician' were pioneers in bringing made-to-measure spectacles to the market place in New Zealand, as others were doing at much the same time in many other parts of the world.

WHO WAS PROCTER'S OPTICIAN?

The identity of the anonymous optician was revealed in two newspaper reports of the camera obscura that Procter was exhibiting around New Zealand during 1879 and 1880. The lens of the camera obscura is reported as the handiwork of a Mr. Pugh, an optician who was employed as an "operator" in Mr. Procter's workshop in Christchurch.[34,35]

A search of newspapers and official records reveals a little bit about William Pugh. He was a Londoner, born in 1824, who like Procter decided to try his luck in Australia. He arrived in Australia in January 1849, as did Procter, but disembarked in Melbourne rather than Adelaide. He was accompanied by his wife and six-month old daughter and the passenger list gives his occupation as optician.[36]

Australia did not suit the Pugh family and they returned to London in 1852 where the 1861 census records his occupation as an 'optical instrument maker' and as 'optical glass worker' in the 1871 census, suggesting he was an optical lens maker rather than a sight-testing optician.

A few years later, Pugh left London for New Zealand and was followed by his family, his wife and four children, who arrived at Timaru, New Zealand in November 1875.[37] The reason for this second go at emigration has not been uncovered. Perhaps Procter got to know Pugh when they were both in Australia in the 1850s, or perhaps they met when they were in London in the 1860s and if so Procter may have invited him to work with him in Christchurch.

However, we do know William Pugh was employed by Procter in 1877, possibly earlier, as his lens maker. We do not know if he did sight testing or if that was left to Procter. In the absence of evidence to the contrary, the latter is the more likely. Procter was always the front man.

We also know that Pugh's training as an optician and optical glass worker, said to be with the famous London firm of Dollond's, enabled Procter to supply made-to-measure glasses because Pugh could make lenses to the optical powers ordered for individual clients. This included cylindrical lenses for correction of astigmatism.

What remains a moot question is whether Pugh taught Procter about refractive errors and their correction, and perhaps provided the optometer. It is entirely possible that Pugh passed on his knowledge gained from his training at Dollond's to Procter. Equally possible is that Procter, the entrepreneur, taught himself about sight testing once Pugh had set up a laboratory to make lenses to suit the needs of individual clients.

WAS PROCTER THE FIRST NEW ZEALAND SIGHT-TESTING OPTICIAN?

Procter was not the first in New Zealand to style himself as an optician.

James Henry Marriott (1799-1885) was the first person to advertise as an optician in New Zealand newspapers. He was identified as an optician as early as 1847[38] and first advertised as such on June 9 1849.[39] He advertised as an Optician and Mathematical Turner who made and repaired telescopes and sextants. His infrequent advertising ceased in 1872 and while he sometimes offered "spectacles to suit all sights" he never offered to test eyesight.

At first blush the honor of being a sight-testing optician in New Zealand might go to Mr. A. J. Solomon, who advertised as an optician and sometimes as an oculist optician from 1872, five years before Procter did so.

Solomon advertised[40] that he “gauges sight with marvelous accuracy by an optometrical apparatus” of his own discovery, which he claimed to be better than von Graefe’s. However, unlike Procter he does not seem to offer made-to-measure spectacles but instead seems to have relied on a “regular supply (from London) of warranted pure Brazilian pebble spectacles suitable to all sights.” He advertised prolifically and was often lionized by the press, [41] most likely as a reward for his advertising in the newspapers.

It transpires, however, that Solomon was a charlatan and his career as optician and oculist in New Zealand was short. A warrant for his arrest was issued in April 1873 on the charge of obtaining money under false pretenses. He had diagnosed an eye condition as extreme and offered treatment with ointments at a cost of £50 ($US 6,000 in today’s values). Medical testimony said the ointments were useless and may have aggravated the condition. He was convicted on April 12 with damages of £20 awarded to the plaintiff, but Mr. Solomon had already fled Christchurch, only to reappear the next month selling his same story in Australia.[42] The account of his downfall in the *Timaru Herald* ends by calling newspaper editors to account for giving testimonials to regular advertisers without due diligence.[43] Solomon might have been New Zealand’s first sight testing optician in 1872, if in fact he tested eyes as he claimed, but he gone from New Zealand within only ten months.

William Percival is another contender for the crown of being the first to style himself as an optician in New Zealand and engage in sight testing and making spectacles to measure. Percival was born in England in 1817 where his occupation was rule maker [44] and his father was an optician. He came to Melbourne, Australia, in 1861 where he set up business making and selling tape measures, rules, callipers and other measuring devices.[45] He called himself an optician in his Melbourne advertising although he did not advertise spectacles. He moved to New Zealand in 1863 setting up business in Dunedin. He advertised as an optician in 1864,[46] some 13 years before Procter did so.

While he then advertised spectacles “to suit all sights” he also sold general merchandise, including umbrellas and parasols.[47] In 1865 he adds Spectacle Maker to his professional title and says he can make “spectacles adapted to suit their sight.” No advertisement was found in which he offered sight testing or the use of an optometer, and none making claims that astigmatism could be corrected. The major part of his business was selling and buying scientific, optical and mathematical instruments. He also dabbled in real estate and this may have been a cause of his bankruptcy in 1890.[48]

While Percival called himself an optician in the 1860s and sold spectacles there is no convincing evidence that he tested eyesight or ground lenses to suit. His role as a “spectacle maker” may have been to cut imported lenses to shape to fit them to spectacle frames.

A history of New Zealand optometry published in the *Commonwealth Optometrist* in 1927 briefly acknowledges some of New Zealand’s 19th century opticians including Procter, who is noted for “grinding and fitting cylinders and compounds as far back as the early 70s with remarkable success as some of his old patients still testify.”[49] Only two other names of 19th century New Zealand optometrists are recalled in this article, A. Levi and T. Peacock.

Alfred Levi was a "consulting and manufacturing optician" in Wellington, New Zealand. However, he post-dates Procter: he was a much younger man and did not advertise as an optician in New Zealand until in 1888, ten years after Procter did so. His earliest advertisements offered "thorough testing of the eyes (with trial glasses)"[50] and it was not until the 1890s that he advertised spectacles for astigmatism.[51] and that he tests "the sight of each eye thoroughly (using) the most modern appliances."[52]

Mr. Peacock advertised as an optician in the 1860s well before Procter, but did so almost exclusively by publishing the weather conditions of the previous day, no doubt to promote the thermometers and barometers he sold. In 1871 he began advertising as an "optician, mathematical and nautical instrument maker" and his advertisements indicate that while he sold "spectacles in great variety" that were imported from overseas, the main part of his business was selling a considerable diversity of optical and nautical instruments.[53] He also advertised sewing machines extensively between 1875 and 1880.

Peacock did not advertise correction of astigmatism or the use of an optometer or other sight testing methods until 1891 when he says he gives "special attention to astigmatism."[54] From 1892 he advertises that "eyes are tested separately and effectively by the most recent and improved instruments and methods brought by Mr. Peacock from England and the Continent on his recent trip" and that "astigmatism and other defects of vision are corrected."[55] His adoption of modern optometry occurs over a decade later than Procter's.

On the evidence gathered it seems that Procter was the first sight-testing optician in New Zealand in 1877 and was also the first to have his own lens-grinding laboratory.

INFLUENCE OF T. R. PROCTER IN AUSTRALIA

Procter left New Zealand for Australia in 1888. He set up practice in Melbourne at 7 Burlington Terrace at 388 Albert Street. This elegant set of two-story terrace houses still remains today, situated facing the imposing 19th century neo-gothic Catholic cathedral and the grand sweep of the Fitzroy Gardens. It was a good address.

Most likely Procter left New Zealand for financial reasons. New Zealand suffered an economic depression from 1885 to 1900 but before that Procter was in financial trouble and was declared insolvent in February 1880.[56] In contrast, "Marvellous Melbourne" was booming in the 1880s and may have seemed a good place to start again.

Did Procter have an impact on the development of optometry in Melbourne? Probably not. It was too late: modern optometry in Australia was emerging from other directions. The use of an optometer was being advertised by local Australian optometrists from 1882 [29] and correction of astigmatism from 1886.[33] Procter may have preceded these practitioners but that was when he was in New Zealand. By 1888, when he arrived in Melbourne a number of Australian opticians had already caught up.

Other leadership figures had emerged. The most significant in Melbourne was Henry Vanheems. Vanheems (1831-1917) emigrated from London to Melbourne in 1852 where he was employed by Thomas Gaunt and Company, a reputable Melbourne firm of jewelers and clockmakers founded in 1858, which from 1866 also advertised as opticians.[57] Vanheems learned the optical trade with Gaunt's and rose to become its managing director.[58] He became a highly regarded private tutor in optometry. There was no optometry course in Melbourne until 1913. He trained a large number of Melbourne optometrists who would be the profession's leaders in the first decades of the 20th century, and even taught a few ophthalmologists.

Melbourne optometrists William J. Aird and Arthur Jones may have been mentored or influenced by Procter. William J. Aird had worked for Procter and continued the Procter practice for two years after Procter's death.[59] Arthur Jones advertised himself in 1909 as successor to the late T. R. Procter, [60] but neither Aird nor Jones became optometric leaders.

Nevertheless, Procter did have an influence on the early development of optometry in Australia, but indirectly. He was as a pebble dropped in a New Zealand pond from which ever-expanding ripples reached the shores of Australia. He trained or was a mentor of some sight-testing opticians in New Zealand who later came to Australia.

The first was Charles Pugh (1854-1902) a New Zealand optician who came to Australia about the same time as Procter. He was certainly in business in Melbourne as an optician in 1890.[61] Charles Pugh was the son of William Pugh, the 'qualified optician' who worked for Procter, and would have trained his son. Procter may have also been Charles' mentor or at least a role model. After his training in Christchurch, New Zealand, Charles seems to have practiced optometry in Dunedin although the evidence is slender.[62] On migrating to Melbourne he set up his business at 19 Gertrude Street, Fitzroy,[63] not far from Melbourne's central business district. He moved to No. 13 in 1898.[64] The tiles of the entrance porch to these premises, now a café, still carry the sign "C. W. Pugh Optician".

Charles Pugh clearly brought his father's lens making skills to Melbourne. In the 1891 Sands and McDougall Directory for Melbourne [63] he styles himself as a 'manufacturing ophthalmic optician' who can make "every description of compound astigmatic spectacles and eye glasses made to order on the shortest notice; oculists prescriptions accurately made up." Later he claimed the patronage of the Right Honorable the Lord Brassey K.C.B., who was the Governor of Victoria from 1895 to 1900.[64] Pugh's business was based on word of mouth reputation because there is no trail of newspaper advertising for his business.

It is no more than a hypothesis but Charles Pugh may have come to Melbourne at Procter's behest to be his lens maker but chose to operate independently of Procter so he could supply lenses to other opticians as well as Procter. This might explain Pugh's lack of advertising. Procter by contrast was a prolific advertiser.

On the other hand Procter's 1902 biography reports that he had brought with him his experienced staff and his complete plant from New Zealand.[1] His "experienced staff" could have been Charles Pugh, ensconced in Gertrude Street, Fitzroy, but in Procter's personal reminiscences[11] he says his extensive workshop was attached to his consulting rooms in Albert Street, East Melbourne. His probate lists the value of his plant, tools and stock at £567, a not inconsiderable sum at the time ($US 60,000 in today's values).[65]

Charles Pugh died in 1902 at the age of 49. His business was continued by his wife[66] until it was purchased by Ernest MacFarlane in 1907.[67]

It is quite possible that MacFarlane was the person employed to continue the practice after Pugh's death and that he was also trained by Pugh. The evidence for that is twofold, albeit very indirect. MacFarlane was the right age: he was 29 when he bought the practice, old enough to have completed an apprenticeship and to have managed the Pugh practice for 5 years and he was also exceptionally well-trained in lens making.

The Kett Optometry Museum has a remarkable bifocal lens made by Ernest MacFarlane in 1902 (Kett Cat No. 0109). It is an invisible bifocal made by sandwiching a 17 mm diameter high refractive index glass button, the near vision segment, between two larger lenses. It is contained in an envelope inscribed "*1st invisible Bi-focal lens made in Melbourne by Self = 1902 / 'invisible' but not fused*". The item was donated by Ken MacFarlane, Ernest's son. The lens is accompanied by a cutting from *The Optical Journal* dated 1902 explaining the optics of the invisible bifocal. If Pugh was McFarlane's mentor, he did a good job of training him in lens making and setting the right attitudes toward his profession. MacFarlane continued his learning: he obtained a Doctor of Optics degree by correspondence from the Philadelphia Optical College in 1910 and was elected a Fellow of the UK Institute of Ophthalmic Opticians in 1930.[•]

The second way Procter influenced optometry in Australia was by training Alfred Percival Greenfield to be an optician.[†] Greenfield was a New Zealander, born in Dunedin in 1864, who after completing his training with Procter in Christchurch migrated to the economically greener pastures of Australia in 1886,[68] two years before Procter returned to Australia. Greenfield settled in Brisbane, Queensland, where he established himself as an oculists' optician in June 1887.

He immediately claimed that he was the only practical oculists' optician in Queensland and invited the public to "Call and get your eyes scientifically tested and measured".[69] He was entrepreneurial (like Procter). Within two months of establishing his practice he had arranged for a long promotional article to be published,[70] which reports that Greenfield tested for astigmatism and had a full scope workshop for grinding lenses and fitting them to spectacle frames, including cylindrical and prismatic lenses. The Kett Optometry Museum holds a digital copy of a photograph of Greenfield's optical workshop taken about 1912, which has nine employees working in it (Kett Cat No. 2788).

Greenfield advertised prolifically often claiming to be the only "practical oculists' optician in Queensland."[71] He also claimed to be the person who introduced "practical sight testing" to Queensland.[72]

The spirit of Thomas Procter and William Pugh from Christchurch, New Zealand, had been relocated to Brisbane, Australia.

Greenfield was prominent in the emergence of organized optometry in Australia. He would have been the foundation President of the Queensland Institute of Ophthalmic Opticians in 1908 had he attended the inaugural meeting.[3] He was made president the following year. He was a foundation member of the Opticians Registration Board of Queensland in 1917 and represented Queensland to the meeting in Melbourne in 1918 that founded the Australasian Optometrical Association that is now Optometry Australia.

Procter's ripples in the pond kept expanding. H. A. Barraclough became a partner with Greenfield in Brisbane (Queensland) and in 1894 they established a practice in

• The Kett Optometry Museum holds the original certificates for his Doctor of Optics degree and his Fellowship of the London Institute of Ophthalmic Opticians.

† Reference 68 records Greenfield's teacher as J. R. Procter. This would be John Robert Procter, the son of T. R. Procter but this is most likely an error. John was an optician trained by his father and William Pugh. He set up in business for himself in Christchurch as jeweler and watchmaker about 1884 but John Procter was only 12 years older than Greenfield and did not advertise as an optician until 1889, by which time Greenfield was in Brisbane.

Sydney (New South Wales),[73] which Barraclough continued under his own name when their partnership was dissolved. Barraclough was no doubt inspired by Greenfield. He was an innovator and an optometrist keen to push the boundaries. In 1898 he advertised that his practice had a De Zeng refractometer, a Wilson's phorometer and a Javal's ophthalmometer.[74] He was elected the President of the Australasian Optical Association at its foundation meeting in 1904. His two sons became optometrists.

Thomas Procter did not set out to be a sight testing optician and was never driven by any altruistic desire to bring optometry to the antipodes for the betterment of society. His career was defined by chasing opportunities that morphed into his becoming a sight-testing and manufacturing optician in 1877, the first in New Zealand, albeit with a good deal of help from his employee, William Pugh, a London trained optician. Without him Procter probably would most likely remained a jeweler.

Procter was energetic, a risk taker and self-confident man in search of his fortune. He did not make his fortune as his probate shows too clearly,[65] but he did set the ball rolling in New Zealand optometry as early as 1877, and two of those he trained in New Zealand who migrated to Australia in the late 1880s, had a significant influence on Australian optometry.

ACKNOWLEDGEMENTS

I am immensely grateful to Margaret Augusteyn and Caroline Moore who gave enthusiastic assistance searching for and evaluating archival records. They found many jigsaw pieces that I would have missed and have enabled a far more complete picture of this story to be assembled than would have been possible without their help. I am also grateful to Margaret Augusteyn for her comments on several drafts of this article and her meticulous proof reading. My thanks go also to my fellow archivists in the Kett Optometry Museum for their helpful comments on an early draft of the article.

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