

Planting the seeds: Early innovators

We acknowledge the first innovators of knowledge, here on the Country you stand, the Country of the Gadigal, and we acknowledge the Elders and people who continue to innovate and pass this knowledge through the generations with care for Country.



Physics was one of the three original disciplines of the University at its founding in 1850. In 1882 the Faculty of Science was created, and the Department of Physics was born.

The first Head of the Department was **Richard Threlfall**, who was a student of Lord Rayleigh and a colleague of J.J. Thomson at Cambridge.

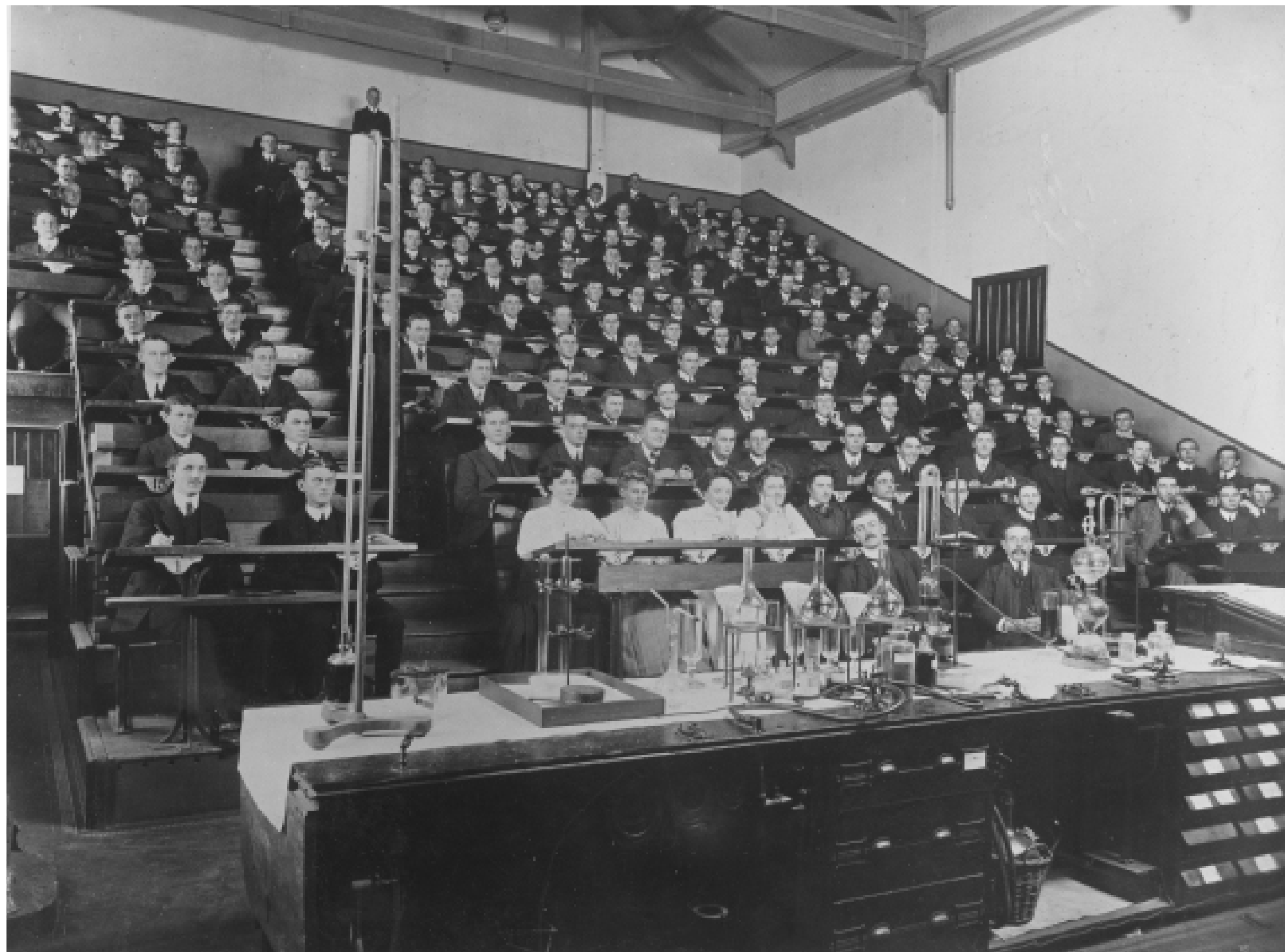
The original Physics Building was constructed in 1888 to precise specifications by Threlfall and was touted as the best in the entire world outside Great Britain.



The original Physics Building, now part of the Badham Building on Science Road, c. 1890



Richard Threlfall, c. 1880



First Year Chemistry class, 1909

Sydney University was one of the first universities to admit women on the same basis as men.

In lectures, students sat in numbered seats, with the women in the front rows. Demonstrations were the heart and soul of lectures.

In 1925, **Phyllis Nicol** became the second woman to graduate with a physics major. After graduation, she was appointed as a Demonstrator in the new Physics Building, where she taught for the rest of her life. While physics education for women was accepted, prevailing attitudes meant that she was not offered a permanent appointment until 1953.

Nicol, working with her colleague **Edgar Booth**, wrote a seminal textbook: *Physics: Fundamental Laws and Principles*. It was first published in 1931, and ran to 16 editions, the last being published in 1964.

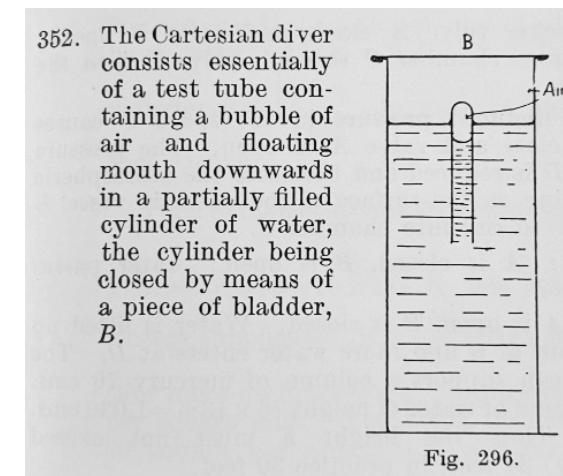
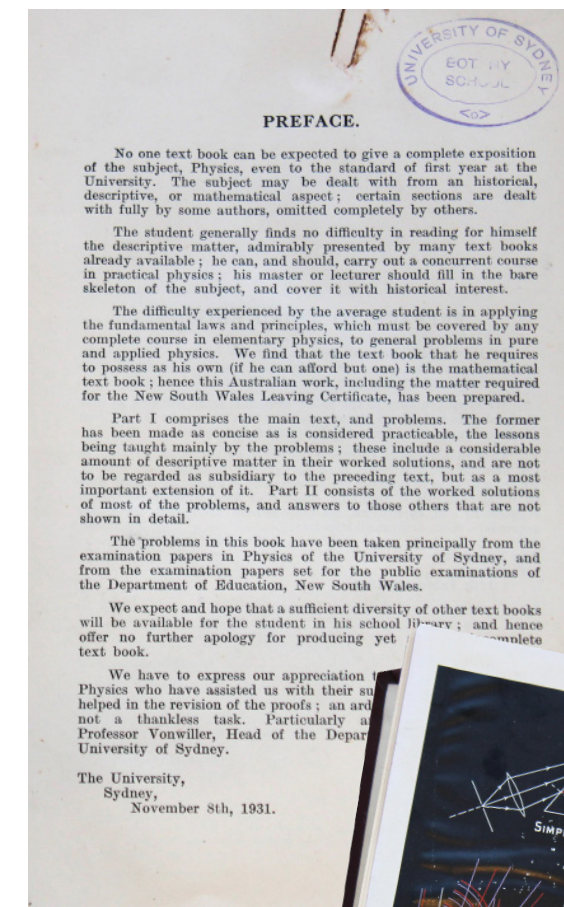


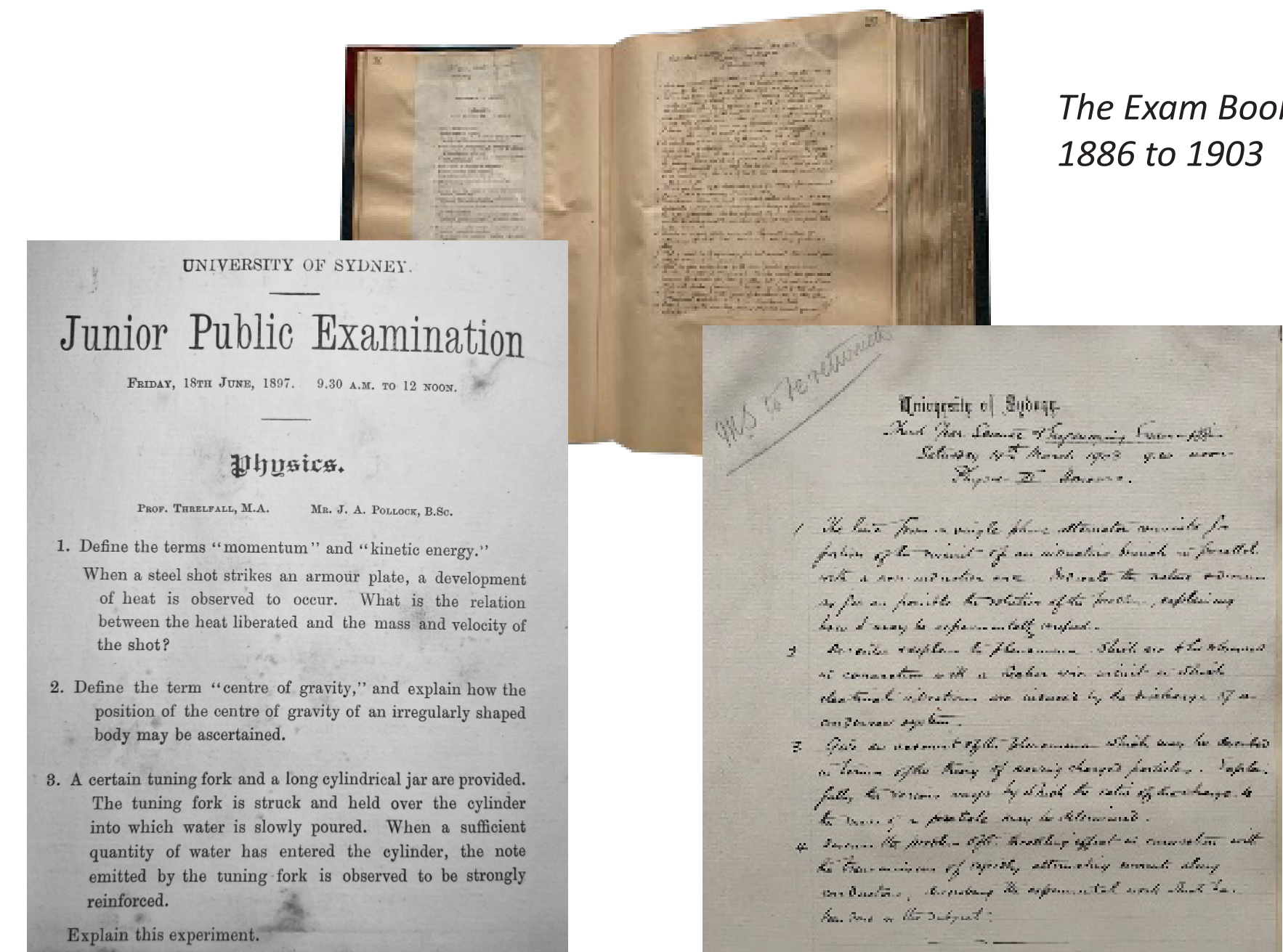
Diagram of a Cartesian diver, from Booth & Nicol's book



Phyllis Nicol with Women's College students, 1944

Students were **Phyllis Nicol's** vocation. Her genius was that, through her teaching, the most unpromising candidates could pass Physics I, a prerequisite for many Science courses and the first compulsory hurdle for many other courses, including Engineering and Medicine. Her legacy was to help others on the path to opportunities, particularly so for women in physics.

As the first Department of Physics in Australia, the Department shouldered the responsibility of setting and policing standards of high school and technical education in (and sometimes outside) the State. In the School Archives there is a book of all early (1880 to 1902) exam papers set within the Department covering the university, technical and high school sectors.



Part of the Junior Public Examination for physics high school students, 1897

A handwritten Third Year Physics exam paper, 1903

The Department continued to be involved with support of teachers and examination of school students. Edgar Booth was for a time President of the Science Teachers' Association of NSW; in the interest of teachers he launched a journal Environment, a Magazine of Science. Copies of the magazine (1933 to 1937) are in the Fisher Library. Booth (30s) and **William Love** (40s) served as Chief Examiners for the high school Leaving Certificate.

1880

1890

1900

1910

1920

1930

1940

1950

Threlfall insisted on physics being taught as an experimental discipline. On arrival in Sydney, he had with him teaching-laboratory apparatus on which he had spent thousands of pounds without authorisation, and threatened to return to England unless suitable facilities were provided.



Ballistic galvanometer manufactured by H. Tinsley and Co. London

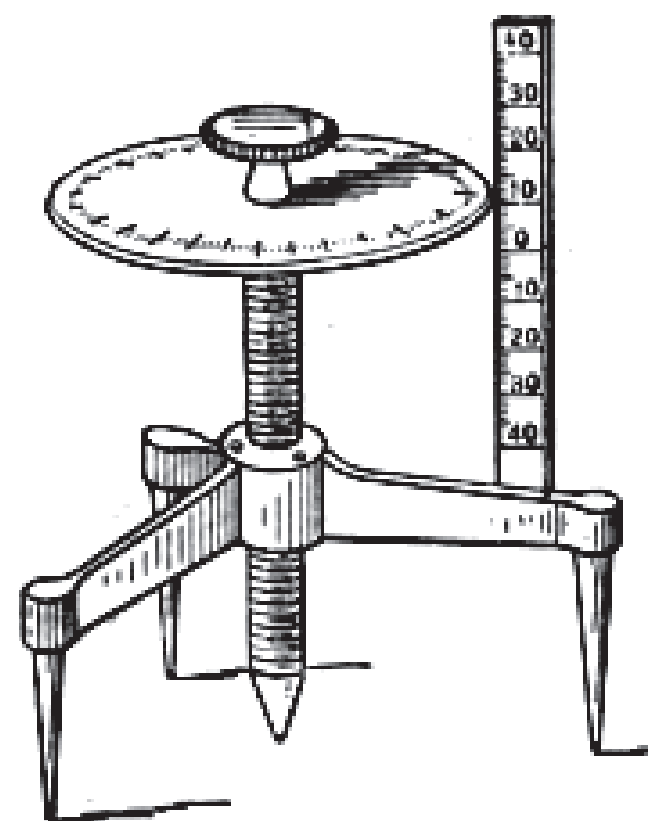
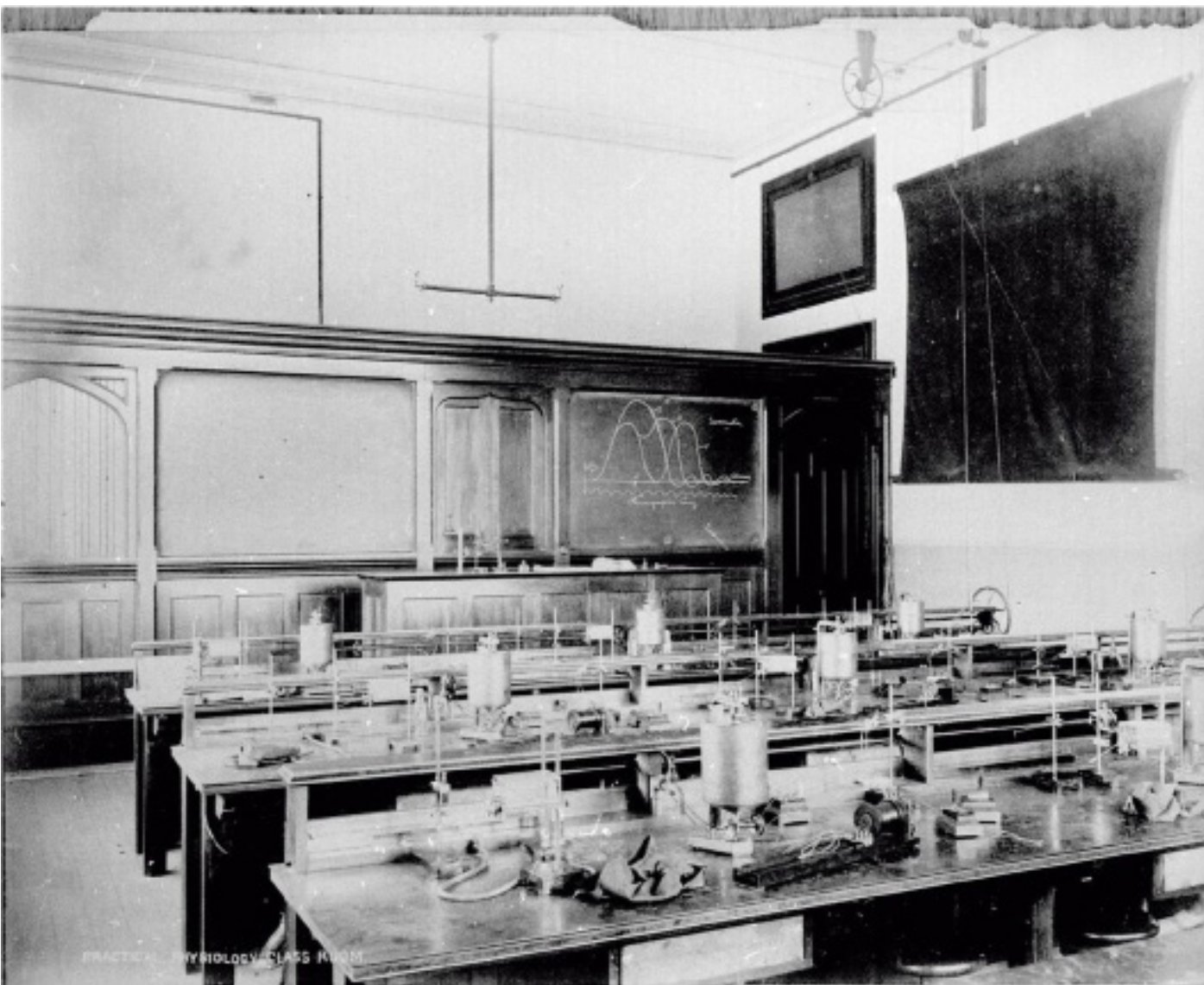


Diagram of a spherometer, from Threlfall's book

On Laboratory Arts, a book written by Threlfall in the early 1890s, included many experiments which are in use in some guise today: vibration, optics and electricity.

The book has been selected by scholars as being culturally important and is part of the knowledge base of civilization as we know it, worthy of preservation, available in public domain in many countries.



Physics teaching laboratory in Threlfall's original Physics Building, 1890

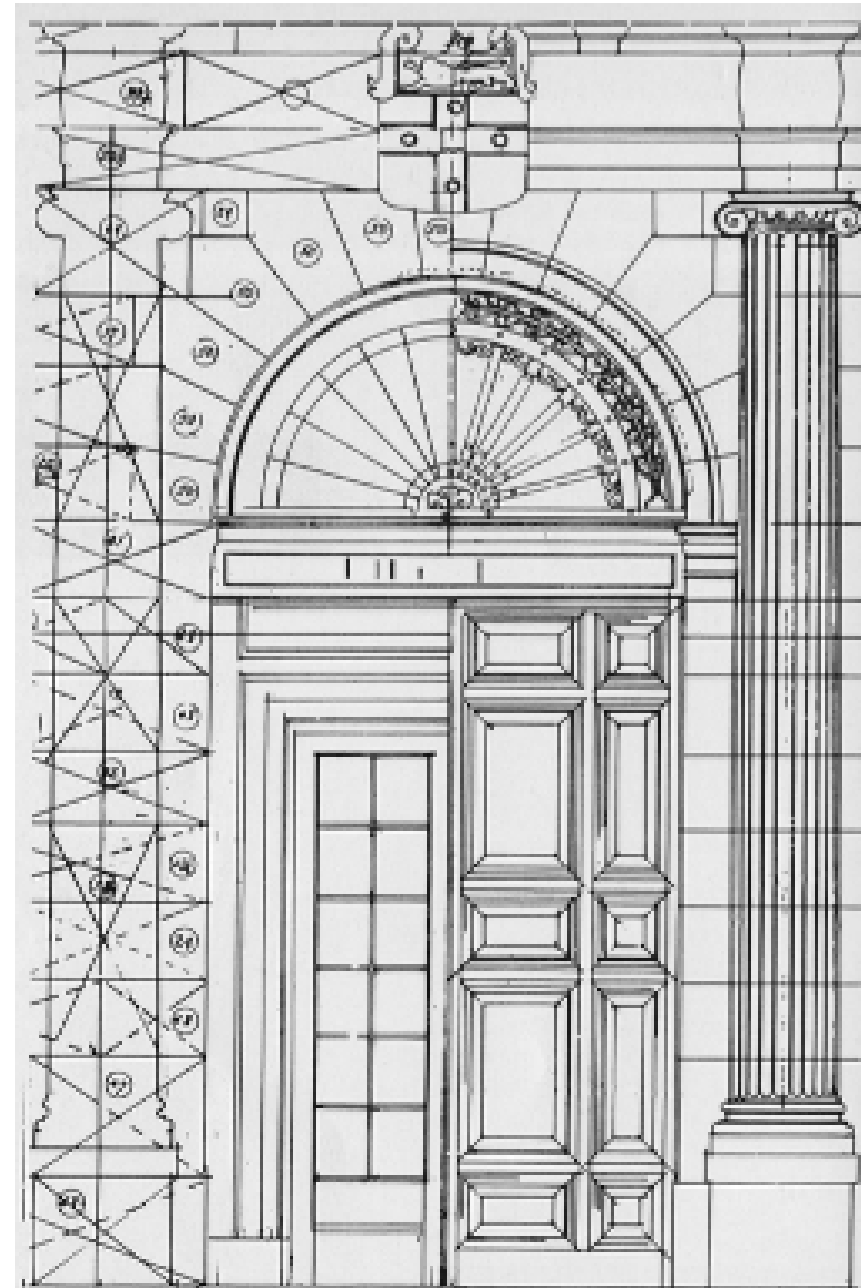


The new Physics Building on Physics Road (Manning House in foreground), 1924

In 1920, a completely new Physics Building was commissioned under **James Pollock** (who succeeded Threlfall in 1899) and completed under **Oscar Vonwiller** (who succeeded Pollock in 1923).

On the ground floor there will be two lecture theatres capable of seating 150, and these will be supplied with apparatus for demonstration purposes from adjoining preparation rooms. The lecture-rooms have been kept small so that students will get every opportunity to watch and hear the lecturers. In big lecture rooms it is not an uncommon thing sometimes for students to complain of not being able to observe work done on blackboards, and it is usually a difficult matter for those in the back rows to watch any experimental demonstrations that may be given.

- Sydney Morning Herald, 5 April 1924



Sketch of the entrance to the Physics Building by the architect, Leslie Wilkinson

During WWII, the Physics Department was selected to train a group of First and Second Year Science and Engineering undergraduates in the science of "radio location". Under **Victor Bailey**, the young men spent an intensive six months studying radiophysics, after which they served in the war as radar officers.

One of the Bailey Boys, **John Bennett**, returned to Physics a decade later to become the Professor of the first Department of Computer Science in Australia. The companion work on radar carried out elsewhere on campus laid the foundation for Australia's ground-breaking achievements in radio astronomy.



Group portrait of the third class of "Bailey Boys", together with lecturers and tutors, 1943