

Part I. Public Services.

I. Engineering Education in Victoria.

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UNIVERSITY OF MELBOURNE.

The Act establishing the University of Melbourne was passed in the year 1853, and shortly after this a skeleton staff of four professors was brought together. Subsequent development, however, was not along the lines followed by the universities of the old world, but was a growth reflecting the necessities of a new country in which gold had recently been discovered. The first classes provided were in classics and ancient history, mathematics, natural science, and modern history and literature. These subjects provided a nucleus for a Bachelor of Arts Degree which accordingly was established in 1855.

Up to this time the young engineer obtained his practical experience in the office of a practising engineer, and picked up his theoretical knowledge as best he could.

Perceiving this lack in educational facilities, Professor Wilson, who was in charge of Mathematics and Physics, submitted a draft scheme in 1858 to the Professorial Board for instituting an engineering course, the result being the inauguration of a certificate in Civil Engineering and Surveying in 1860.

In 1861 this certificate course was definitely started, and the subjects which were not available in the course for the B.A. degree were supplied by a Lecturer in Surveying, Mr. James Griffiths, B.A., C.E., of Trinity College, Dublin, and later Mr. J. G. Knight, F.R.I.B.A., was appointed lecturer in engineering subjects.

To show the difficulties under which the early engineering students studied, it is on record that they had no workshop, no place to draw, and no place for the exhibition of models.

In the year 1867 Mr. Griffiths resigned, and Mr. Andrew, then a mere youth, took charge for some six months, at the end of which time he left to continue his studies in England, and in 1868, William Charles Kernot, M.A., C.E., an engineering student of the University with some outside experience, was appointed to the position which he held for more than 40 years.

At this time permission was granted to the lecturer and his students, to visit the Government Railway Workshops at Williamstown (afterwards moved to Newport) thus inaugurating the practice so regularly used up to the present time.

THE SCHOOLS OF MINES.

Concurrently with the growth of the Engineering School of the University, the mining industry was increasing in complexity, and the necessity for training mining engineers was forcing its way forward, with the result that,

through the action of the leading citizens of Ballarat (1870) and Bendigo (1873), the Schools of Mines came into being, but without any connection with the University. The work of these schools was mainly directed towards the production and recovery of gold and other precious metals, with the result that classes were largely on the chemical side. This was so marked that Mr. Donald Clark, M.M.E., B.C.E., Chief Inspector of Technical Schools, records that one School of Mines had no physical laboratory and practically no equipment for one.

The starting of these schools evidently caused the University to establish a certificate of Mining Engineering—Mining and Metallurgy being allowed as an alternative to Civil Engineering in the last year of a three years course. By this time, Government Departments were placing University students in their offices to a limited extent, but seemed to think that a University training was something to be put up with rather than encouraged. As a result of his training a University man was not well suited for office routine, and was on the whole poor at the elementary work he was put to; while a boy who had spent all his time at office drudgery was regarded as the more useful servant.

In 1875 a drawing office was made available to the engineering students, a suitable room being placed at their disposal, and in 1879 a museum for the exhibition of mining specimens and apparatus was provided—an old underground kitchen being turned into a workshop for Civil Engineers. From this time the engineering school never looked back, increasing both in the number of its students, and the extent of its buildings and equipment.

In 1871, Edward Wilson left £1,000 to establish a scholarship in engineering, now known as the "Argus" scholarship. This was the first of many valuable scholarships left by benefactors to the School.

EVENING LECTURES AT PUBLIC LIBRARY.

In 1870, in order to meet the requirements of persons in employment, twelve evening lectures, with laboratory work, were delivered in Chemistry and twenty-four in Geology of Mineral Deposits, in the Technical Section of the Public Library. Eleven lectures were also delivered on various other subjects, the attendance being very gratifying. These lectures were continued for a period of about ten years, but were finally abandoned when the Working Men's College (now the Melbourne Technical College) was founded in 1882.

In 1883, a Chair of Engineering was constituted at the University, Mr. W. C. Kernot, being appointed as the first Professor, and the degrees of B.C.E. and M.C.E., were

established. At the same time provision was made for holders of the Certificate of Civil Engineering to obtain these degrees upon passing certain examinations, or by presenting a satisfactory thesis.

A faculty of engineering with the Professor as Dean was constituted in 1888, and the control of the course thus removed from its previous position under the Professorial Board.

THE WORKING MEN'S COLLEGE.

To help in the education of persons employed during the day, Mr. Francis Ormond in 1882 offered conditionally the sum of £5,000 towards the establishment of a technical college in Melbourne in which help was to be given "to those who show a willingness to help themselves," and after considerable delay he had the pleasure of seeing the Working Men's College open its doors to students in 1887.

The College was a great success from the very first. The small rooms provided in the original building were overcrowded, and the press and Government developed an interest in the work which was notably lacking before. Evening classes in science and engineering subjects were introduced into the curriculum and the practical and theoretical aspects of engineering were both catered for.

At first, each class was controlled by its own instructor under a general guidance of the Director, Mr. F. A. Campbell, M.C.E., an engineer trained at the University. On looking over a list of names of the early instructors in engineering subjects, those of a number of University graduates holding important professional positions are found, while many of the early students have since occupied prominent professional positions.

In course of time (1889), to ensure the success of the college, it was deemed advisable to start day classes in engineering and other subjects so that instructors could give their whole time to teaching work, and satisfactorily handle the large number of students who were attending. The writer was then advanced from the position of instructor in several engineering subjects to that of instructor in charge of engineering classes. Diploma classes in mechanical and electrical engineering were inaugurated and laboratory work was conducted largely with extemporized apparatus.

By this time new buildings had been erected and the class facilities improved. The testing laboratory, in which a great deal of the heavier apparatus was located, was, however, but a partitioned-off passage.

UNIVERSITY EXTENSIONS.

Concurrently with the development of the Melbourne Technical School, the number of students in the University Engineering Course was increasing, and better provision had been made for the classes. By the year 1888, two large rooms were in use, one as a lecture room, and the other for a workshop and laboratory.

A number of machine tools and lecture models had been purchased and a 50 ton Greenwood and Batley testing machine, installed at a cost of about £600, replaced a primitive wooden machine with a capacity of 30 cwt., which had been in use previously. After the collapse of the land boom, a building which had been erected by the Education Department as a Teachers College was vacated and part of it was handed over for the use of the Engineering School. This was, however, only a temporary arrangement

and when the building was required for its original use a fine new engineering building was erected. It included lecture rooms, library, workshop and testing laboratories of modern design. This building is still in use as the south wing of the larger school now existing. Later a mining and metallurgical school was erected together with a testing plant for the treatment of various ores.

On the death of Professor Kernot in 1909 a new Professor, Mr. Henry Payne, M.Inst.C.E., with English and South African experience was appointed, and, on his arrival in Victoria, £30,000 was granted by the Government for the erection and equipment of extensive additions to the School. The drawing office, electrical, prime movers and hydraulic laboratories, together with a fine workshop and several private rooms were built from this money, and the electrical laboratory equipment allowed the Bachelor of Electrical Engineering degree to be constituted. With these additions several new lecturers were appointed to cope with the work. The buildings were designed to accommodate 100 students.

The rapid growth of the school from this time on was due largely to the energy displayed by the Professor and the interest he aroused in the various Government departments, and elsewhere. Courses in mechanical and electrical engineering were instituted, and as new developments in engineering came along they were added to the courses, the aerodynamic laboratory with its fine wind tunnel being an outstanding example of advance in this respect.

The Professor also took a great interest in the Architectural classes at the University. Up to the time of his appointment architectural lectures had been given mainly to engineering students. He was largely instrumental in starting the Diploma Course in Architecture, and later in inaugurating a Degree of Bachelor together with a Faculty of Architecture.

TECHNICAL SCHOOL ENGINEERING COURSES.

Concurrently with the progress of the University in Engineering, the technical schools were growing apace, and at the time of Professor Payne's appointment to the Chair of Engineering, the Working Men's College had become a recognized school for the education of boys who would ultimately take up engineering positions.

Not only there, but at the Geelong, Swinburne and Footscray Technical Colleges, and the Ballarat and Bendigo Schools of Mines Diploma courses in electrical, mechanical and civil engineering had been started. The entrance to these schools was not guarded by examination as at the University, and as the entrance age was low, many students sought this method of obtaining a training which would lead to engineering positions.

In 1911 the writer resigned the position of lecturer in charge of engineering classes at the Working Men's College to take up the position which ultimately led to the Associate Professorship of Engineering at the University, and Mr. Sarvas, M.C.E., was appointed in his place. He developed mainly the civil and municipal engineering classes.

Speaking at a meeting held in the Melbourne Town Hall in June, 1882, the Honourable Francis Ormond, the founder of the Melbourne Technical College, said "I hope to see a causeway laid by which the giants of our proposed college may stride to the higher colleges, and so to the University," and a way is now open by which boys who obtain a diploma at a Technical School may stride in the

way he desires. The Technical Colleges Statute now allows a holder of a Diploma of any recognized Technical School to proceed to the University with exemption from most of the subjects of the first year and some subjects in the second year course. To matriculate, English and another language to the School Leaving Standard must be taken, but this requirement may be deferred.

Many Technical School students now avail themselves of these concessions and quite a number have done well at their work, several being successful in obtaining final honours.

The most notable advance in building and equipment during Mr. Sarvas's tenure was the erection of the Kernot Engineering School at the Working Men's College in 1931. The increased accommodation opened up the opportunity of developing classes in Physics and in Radio and Cinema engineering and, concurrently, the trade classes in electric and oxy-acetylene welding, attracted large numbers. Mr. Sarvas died in 1929, and Mr. Chittleborough, A.M.I.E.Aust., with a large staff of lecturers is now in charge of this important school. The Swinburne and other Technical Colleges have also increased their plant and buildings to meet the growing demand for engineering education. The Gordon Institute of Technology specialized in Architecture and Engineering, its classes in these subjects doing much good work.

UNIVERSITY METALLURGY SCHOOL ESTABLISHED.

In 1924 a Chair of Metallurgy was established at the University and Professor J. Neill Greenwood, D.Sc., was appointed. From the first he realized that however important the metallurgy of gold and other precious metals might be, the metallurgy of the ferrous metals could not

be neglected, and during his tenure he has introduced laboratories and developed the scope of the subject. The Metallurgical buildings erected in furtherance of the scheme are substantial, and well equipped with modern apparatus.

RECENT ADDITIONS.

Meantime at the University Engineering School many useful additions have been made in both buildings and equipment. An Amsler 100 ton testing machine with suitable housing has been installed, the drawing office has been enlarged making available some 200 drawing tables, new lecture rooms and electrical laboratories have been built, and a very fine library has been established.

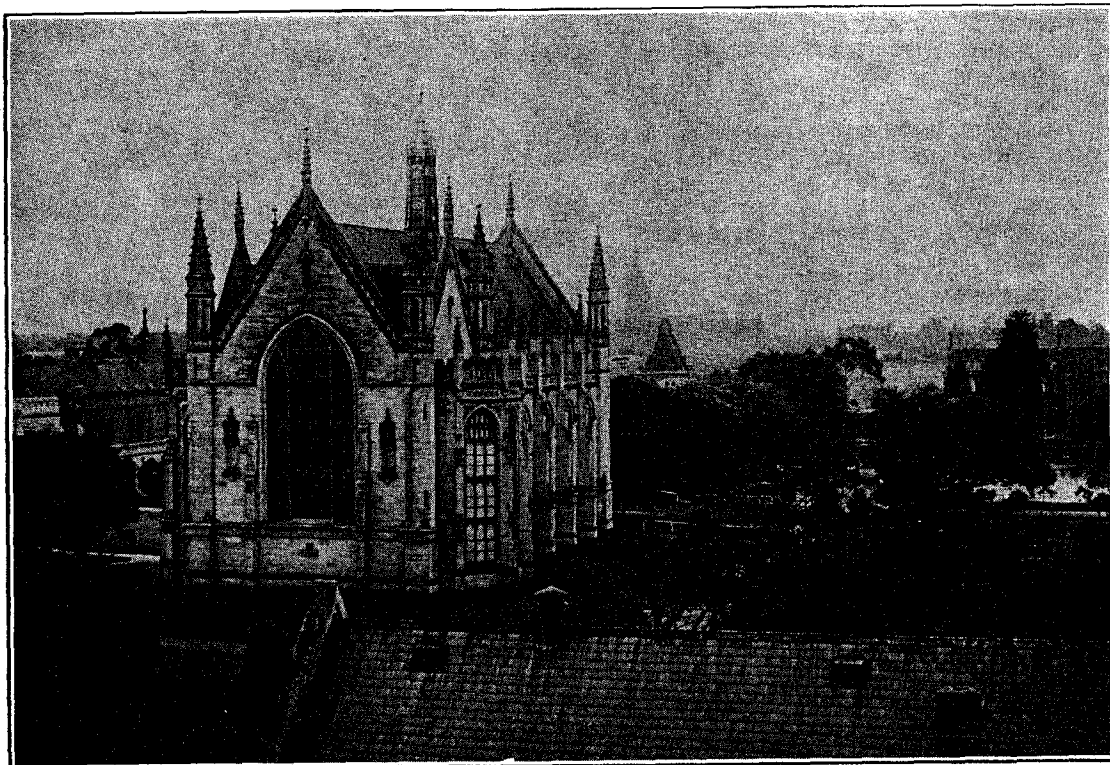
In 1932, Professor Payne retired, and the writer, then Associate Professor, was appointed to his position.

TECHNOLOGICAL MUSEUM.

As previously related, the Public Library, Museums and National Gallery of Victoria (1856) instituted classes in 1871, which were continued until 1882.

After a period during which no adequate accommodation was available, a part of the front portion of the library buildings was made available for technological exhibits and since that time the collection has been extended and brought up to date and a number of working models installed by the curator, Mr. R. Henry Walcott. The collection is now a representative one, and many valuable and original exhibits are available for public view.

Apart from a few guide lectures there is, however, no oral instruction to visitors at the present time, although the curator and his assistant are available for answering questions relating to technological subjects.



View from the Engineering School, University of Melbourne.