History of the Department of Physics at UWA

Issue No. 4: "More about the Original Physics and Chemistry Building at Crawley"

Presented by John L. Robins

Introduction.

We move now to a more detailed consideration of the new (1935) Physics and Chemistry Building. The first article below presents an overview description of the two sections of the building. Perhaps you will recognize, in the photos of the Physics laboratories, some of the stools and benches that were later brought over to our present Physics building. You may also be interested to note the dress code of students of that era.

On the front facade of this building two panels, moulded in the stonework, were introduced to depict great scientists and discoveries in the history of Physics and Chemistry. Even though the stone titles of "Physics" and "Chemistry" have been changed to "Geology" and "Geography", these pictorial panels remain (to the bewilderment of some visitors to the University who do not know of the history of the building and its change of occupancy). I strongly recommend that you view these panels in detail, if you have not done so already, after reading about them in the second of the articles below. These panels remain part of our history on this campus.

You will all be aware of the beauty of the architectural style that pervades our University (neglecting our current Physics building and a few like it). However, I believe that by reading the third article below you will understand in greater detail the artistic and cultural influences that make it so striking and give it much of its charm. The style is truly part of our Australian heritage, rather than just being a copy of styles from elsewhere. Please read on.

Sources.

The three articles were published in the "The Western Mail", Vol. 50, No. 2,593, on October 31, 1935 on the occasion of the opening of a new Physics and Chemistry Building at Crawley. The photos are taken from the same source. Two of the photos have irregular outlines as they originally formed part of a montage.

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A Western Mail article, describing the new Science Building:

THE BUILDING

PLANNING AND EQUIPMENT

Part of a Larger Scheme.

COOGEE limestone has been used for exterior walling, and artificial stones for the columns of the cloisters of the new Science block, 300 feet in length, and designed in similar style to that of the main Hackett buildings, simplified to some extent in view of special requirements. The building is designed one day to form part of a larger scheme, as one unit of a group of buildings which will front the Great Court. The central unit and focal point will then be a library block, and the southern unit a faculty building corresponding in design to the Science building. It is proposed to give the library building a tower feature to balance the Hackett buildings. This vision of a completed plan will, no doubt, be in the mind of speakers at today's ceremony.

The main new building is divided into two sections devoted to Chemistry and Physics respectively. The old wooden buildings will still be used for first year laboratories for these sciences, as it was considered unnecessarily costly to provide in the new buildings for large laboratories for first year students. First year laboratories are only used for a few hours per week, but require large floor areas. The other portions of the old wooden buildings are being reconstructed to provide increased space for Agriculture and Botany, two sciences of the greatest importance to primary industry and those in which increased accommodation is urgently needed.

The Main Features.

The Chemistry section has a large lecture theatre to seat about 200 students. It is fitted with exhaust fans, fume cupboards, and so on. A smaller lecture room seats 48 senior students. There are two large senior laboratories, for inorganic and organic chemistry respectively. The main feature in modern scientific laboratories is to provide adequate services of electricity, gas, water, etc. In the new building pipe systems are installed for purified water as well as scheme water, sulphuretted hydrogen and compressed air, in addition to coal gas, direct and alternating electric current of various voltages, and a number of exhaust fans for fume cupboards. The three members of the teaching staff are each provided with a private laboratory as well as an office, and there are large stores in the basement, as well as a Physical Chemistry laboratory. A number of small rooms are set aside for special purposes.

Students attending a lecture in the tiered lecture theatre
of the Physics section in the new Science Building.

Another view of the Physics Lecture Theatre,
showing Mr. J. Shearer (Lecturer in Physics) with a class.

The Physics building has a lecture theatre for 200 students and a smaller lecture room for 60. There are six senior laboratories fitted up for experimental work in different branches of physics. The three members of the teaching staff have each of them offices and small research laboratories. Provision is also made for X-ray work and for wireless research. A small tower, harmonizing with the tower of Winthrop Hall, provides accommodation for the wireless receiving and transmitting room.

Senior student teaching laboratories (General on left and Electrical on right) in the Physics
section of the new Science Building.

Both departments have workshops, dark rooms, small service lifts for stores, small reference libraries, and so forth. In both cases the University has tried to give adequate facilities and room for expansion to two departments which have had to carry on in temporary buildings since the University opened in 1913.

The block has been erected at a cheap cost, about 1/4 [one shilling and four pence] per cubic foot. Modern construction has been used, the chief materials being reinforced concrete, brick, hollow tiles, etc. The modern principle in city building is not to cumber the ground with one and two storey buildings, but to place the buildings on top of one another, and separate the higher buildings by courts planted with grass and trees. This diminishes the interference by noise and gives more light and air and pleasanter surroundings. In this case there are three floors including the basement, and provision is made for building another storey on top when required.

Question of Finance.

The State has benefited greatly by the fact that the Hackett bequest provided the money for the erection and upkeep of the Hackett memorial buildings, which cost £216,000 including a grant from the Government of £25,000 towards the arts, law and administration section. This grant has not yet been paid by the Government, but will be refunded with interest to the Hackett bequest under the University Buildings Act. The actual capital cost to the State for University buildings is only a small one to date, and may be summarised as follows:—

The original wooden building at Irwin-street cost about £3,000, and to this were added the old wooden courthouse buildings, and the Mechanics' Institute transferred from Coolgardie, and now used as a Children's Court. The cost of transfer of some of the wooden buildings to Crawley was several thousand pounds. The Natural Science buildings cost about £17,000, and the Engineering building, £8,000. To this must now be added the present buildings costing £60,000. This money has been provided from trust funds by the University, and will be refunded by the Government over a period of 30 years, together with interest in order that the trusts may be maintained.

Contractors for the new building were as follows:— General work, F. J. Deacon (£40,000); electrical services, R. A. Berryman (£4,870); plumbing, George Hill and Co. (£5,454); and fittings, Bunning Bros., Ltd. (£1,949).

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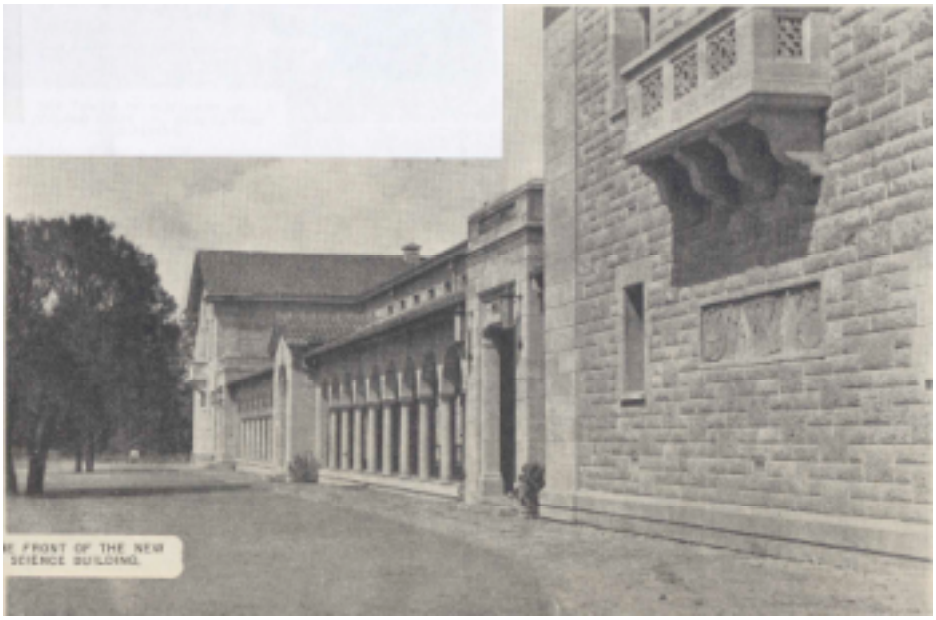
Another Western Mail article, describing the pictorial stone panels on the building:

SYMBOLISM IN STONE

Great Names of Science

On the eastern wall of the Physics wing of the science building is a panel symbolic of five epochs in the development of physics. The panel, 31 feet long and 10 feet high [this should be 10 feet long and 31 inches (or 2 feet 7 inches) high], is made of synthetic stone modelled from a plaster cast. The design is by Mr. George Benson, the well-known artist, and based on suggestions from Professor Ross.



The front of the new Science Building, showing the panel depicting five epochs in the development of physics.

At the extreme left is the ancient Greek philosopher, Archimedes (297-212 B.C.), represented as crying out "Eureka, eureka" ("I have found it, I have found it!") when a test for the purity of Heiro's crown occurred to him during his morning bath. The bath is not quite the conventional Greek pattern, but its somewhat unusual form is explained by the incorporation of the Archimedean screw by which the philosopher had devised means of raising water. Over Archimedes's head is seen a sphere and circumscribing cylinder, recalling a geometrical theorem which made the scientist famous. Beneath is another and smaller figure of Archimedes, a lever and the earth, illustrating his famous saying, "Give me where I may stand and I will move the world."

The next figure is Galileo (1564-1642), the first to apply the telescope in astronomy, he is shown holding up the instrument to give a view of Jupiter and its four moons which he had discovered. Most people of the time denied his discoveries and refused to be convinced by direct observation. The panel shows a person asked to view these new wonders, carefully screening his eye with his hand so that no new moons would be seen. To the left of Galileo is depicted the Leaning Tower of Pisa, where Galileo demonstrated the accuracy of his new laws of falling bodies, while to the right is seen the great lantern of the Cathedral at Pisa, whose rhythmic swings gave him the idea of the pendulum.

Newton, Kelvin, Einstein.

The central figure in the panel is Sir Isaac Newton (1642-1727) the "prince of philosophers", shown under the apple tree which, according to the story, aided him to arrive at his law of gravitation. Lord Kelvin (1824-1907), whose work was in one direction so closely associated with navigation, fittingly finds a place on this panel. He is seen with his hand resting on a ship's compass, an instrument which he improved to such an extent as to permit its accurate performance on iron ships. Kelvin's armorial bearings are shown and beneath them is a design symbolic of his great work in connexion with the Atlantic telegraph cable. A lion's head, for England, and an eagle's head, for America, are linked by a cable, while from the circuit depends a representation of the galvanometer designed by Kelvin for submarine telegraphy. A series of waves recall Kelvin's work on radiant energy, whilst his attempt to bring into one general mechanical theory phenomena of the most varied kinds is symbolised by an imaginative representation of his yacht, the Lallah Rookh, surmounting the waves.

The final figure depicts Einstein, born in 1879, the greatest of living scientists. From a star in the top right hand corner of the panel, rays of light sweep round a sun adorned with its corona, and past the moon to the earth, thus giving a pictorial representation of Einstein's theory as to the deflection of light by massive bodies. His ideas of warped space are also subtly suggested by the curved lines surrounding his figure.

Over the entrance portico of the physics buildings is another smaller panel in the centre of which is shown Michael Faraday's iron ring with its primary and secondary windings. As this apparatus of 1831 laid the basis for all electrical machinery, it is fittingly given this prominent position on the Physics building. To right and left are designs symbolic of spark and brush discharges of electricity while hysteresis is indicated by the leaf-like object within the Faraday ring.

Five Great Chemists.

In the panel on the wall of the Chemistry wing are represented Priestley, Dalton, Boyle, Faraday and Perkin. Joseph Priestley (1733-1804) made very important contributions to pneumatic chemistry (the study of gases) and was the inventor of the pneumatic trough, which allowed gases to be collected and examined. By heating spirits of salt he obtained "marine acid air" (hydrochloric acid gas) and he was able to collect it because he happened to use mercury in his pneumatic trough. He treated oil of vitriol in the same way and got nothing, until by accident he dropped mercury into the liquid and sulphur dioxide was evolved. Priestley heated mercuric oxide and discovered oxygen by means of a burning glass. He is depicted by the artist examining one of his experiments.

John Dalton (1766-1844), the originator of the atomic theory, is shown together with representations of his discoveries. Robert Boyle (1627-1691), the English natural philosopher, was the inventor of Boyle's law, which dealt with the relation between the pressure and the volume of a gas. Michael Faraday (1791-1867) did work on chemical manipulation and the liquefaction of gases. His chemical work was overshadowed by his electrical discoveries. He founded the science of electro-magnetism and he is shown with his magnetic rings. William Henry Perkin (1838-1907), the last figure in the chemistry panel, was the discoverer of aniline dyes.

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A Western Mail article, on the architectural theme of the University's buildings:

RENAISSANCE HARMONY

The Main University Group

Discussing the architecture of the main University group [of buildings], the Vice-Chancellor (Professor H. E. Whitfeld) said that the Hackett buildings and the new Science buildings represented an attempt to develop a simple straightforward architecture suited to the Perth climate—a sunny climate hot in the summer but with a good deal of rain in the winter when the University was in session.

"The late Rodney Alsop, architect of the Hackett buildings," he said, "told us that he based his ideas, in the first place, on the 'Old Colonial' architecture, which was the first Australian architecture after the mia-mia of the aborigines. Those who know Sydney and Hobart, or who have studied Hardy Wilson's beautiful drawings, will recall pictures of the simple buildings erected between 1790 and 1840 in New South Wales and Tasmania. We cannot, perhaps, do better than quote Hardy Wilson, who spent ten years in searching them out and studying and drawing them:—

They were a constant solace and delight in the midst of commonplace later work, and their value in the future of architecture in Australia could not be disregarded. The title "Old Colonial" appears to me to be more appropriate and more easily apprehended than the more accurate one of "late-Georgian". After the Renaissance had ended in Britain, and when Revivals followed swiftly in its wake, the Colonies knew nothing of building fashions except those of the late eighteenth century. Here lingered a style, simple and stately, although of humble execution, which we call "Old Colonial". There is a charm about the name "Old Colonial" which recalls broad eaves, white paint and hospitable porches, set amidst sunshine and history. The scale, the symmetry, the broad surfaces beautifully textured, long colonnaded verandahs, six-panelled doors, and twelve-panelled windows, the staircase winding on its wall, all preserved the tradition of an earlier elegance. Owing to the remoteness of the two Colonies from the scene of changing fashions, the late eighteenth century style was continued well into the nineteenth century, and the succeeding revivals (Greek, Gothic) were also delayed in reaching these shores.

The sovereign guide, or influence, in the development of architecture in a country is geography, with which climate may be included. . . . At a very early stage geography began to mould the "Old Colonial" of Australia. . . . The immense scale of the continent led to the long spreading plan . . . even as the climate led to the universal introduction of verandahs. Most of the homesteads were designed, I believe, by their owners who, although without training, seldom went astray, and left the shaping of stone and wood to the masons and joiners. Yet there is one of whom I can tell: Greenway, Macquarie's architect. . . . To the simplest structures he gave a monumental scale, beautiful proportions and delightfully textured walls.

"Rodney Alsop," the Vice-Chancellor continued, "considered that he had merely worked naturally in the 'Old Colonial' tradition by studying it along with the art of the Mediterranean countries such as Italy, Sicily and Spain. For Perth has a climate similar to that of the Mediterranean countries; and as the late-Georgian (or 'Old Colonial') was a Romanesque architecture which had been taken to England and modified for a cold climate, it would be natural to get some useful hints by studying the original buildings in their sunny climate.

University buildings, viewed from St George's College – 1935.

"Consequently Rodney Alsop found it necessary to return to the fountain head, and develop directly from the early Renaissance of the sunny climate of Italy, where mass and form count more than the applied detail, which in the greyer climate of England became such an important feature of the style. He paid particular attention to the texture of the stone. 'In the problem which we had before us in Perth,' he wrote, 'the plan called for long, low flanking buildings, while the Winthrop Hall provided a great central feature, and the emphasis provided by the tower and gateway left little to be added to complete a composition which in itself expressed the purpose for which it was built. The porches and openings necessary for the arcades, and the doorways and windows provided most of the grouping and subdivision necessary to indicate the anatomy of the plan, and the only enrichment necessary was to emphasise important features. Owing to the small amount of enrichment, it had to be especially emphatic and consequently colour played a most important part.' "

The Great Gate, seen across the Pond.

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