(left) A view of the western side of the Yale Telescope building taken sometime in the 1940s. (right) The Yale Telescope building taken on its completion in 1925. (far right) A fisheye image of the Yale telescope taken in 2002 at the Mount Stromlo Observatory site in Australia. This is the telescope housed in the Yale Telescope building at Wits before its transfer to Australia in 1952. Image courtesy of Wikipedia.
Yale Road, together with the M1 motorway, forms the boundary between East and West Campus. Yale Road derives its name from a long-standing association of Wits with Yale University in the field of astronomy. For over 25 years Wits was the location of the Yale Southern Station, an observatory set up for pioneering research into the southern hemisphere's skies. Today the only legacy and reminder of that association is the quirky and utilitarian Yale Telescope building that once housed the station's skilfully engineered 26-inch telescope. The building is one of the earliest on campus, dating from the early 1920s, and a heritage asset.

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The Yale Telescope building is located within the new built environment precinct of the School of Architecture and Planning and the School of Construction Economics and Management. This precinct comprises the 1959 John Moffat building and its 1980s extension, the new Construction Economics and Management building, designed by Michael Scholes Architects and due for completion later this year, and the Yale Telescope building. The Yale building is protected by the last remaining original eucalyptus trees on campus and forms the slightly awkwardly placed western boundary of the precinct. It now houses workshops and a darkroom with a few academic offices and storage rooms on three narrow floors. There have been alterations through the years, but the building’s scientific and historical significance demands appreciation. It awaits restoration and possibly a new purpose.

South Africa’s successful bid to host the Square Kilometre Array (SKA), led by Wits physics graduate Dr Bernie Fanaroff, is only the latest example of the scientific world’s interest in the opportunities offered by the southern hemisphere. The focus of this article is the story of an earlier era and the important work undertaken by the Yale astronomers who worked at Wits, a story that is better known in the United States than in South Africa.

Until urban development and city lights changed what could be seen in the sky at night, the Highveld was an ideal location for astronomical observation. The Union Observatory, established in 1903 on the koppie that would become the suburb of Observatory, was the centre of southern double star (‘binaries’ to astronomers) astronomy. Under the leadership of the astronomer RTA Innes, with a 26½-inch refractor purchased by the Union government as the primary instrument, the observatory’s achievements signalled to the world the quality of the research conditions in Johannesburg. It was in this way that the Yale Southern Station came to be located in the Wits University grounds and operated from 1925 to 1952.

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The Yale Southern Station was the initiative of Frank S. Schlesinger, director of the Yale University Observatory from 1920 to 1941. He was a pioneer in the trigonometric parallax method and the use of photographic plates in astronomy to determine the relative distance of stars from the Earth, and he wanted to extend the parallax survey to the south celestial pole in a special observatory designed for this work.

Schlesinger had first heard about the “unusually promising astronomical conditions” of the Highveld from Sir David Gill, who had been the royal astronomer at the Cape from 1879 to 1906. Through his friendship with Prof. RA Lehfeldt, the first professor of economics at Wits, Schlesinger met the principal of the new university, Sir William Thomson, and
decided to establish the Yale Southern Station on the fledgling Wits campus rather than at the Union Observatory site.

Schlesinger arrived in Johannesburg on 8 February 1925 and ground was broken for the telescope building only 10 days later, on 18 February. Meanwhile the mounting for the instrument was shipped by freighter from New York to Cape Town and then by rail to Johannesburg, a journey of about 11 000 km. The completely assembled telescope was set on its two piers by 20 May 1925. The observatory was opened on 22 June 1925 by the Prince of Wales (later King Edward VIII), who was coincidentally in Johannesburg during his Empire tour of South Africa.

An article in the Rand Daily Mail (23 February 1925) reported that the telescope would only partially be used by students but it was hoped that the Yale observers would act at lecturers. Wits Council chairman Sir William Dalrymple commented, “[W]e believe it is a great thing to bring the Yale University and the Witwatersrand University into touch and co-operation.”

The Yale Telescope building was described in some detail by Schlesinger. The building is 48 feet (15 metres) long (in the north and south direction) by 18 feet (5.5 metres) wide (in the east-west direction). The total height is 46 feet (14 metres). The telescope was to be used only in or near the meridian or line of longitude and therefore did not need a manoeuvrable dome typical of an observatory. Access to the sky is obtained by a double pitched roof that slides away in two halves from a central peak, one half to the north and the other to the south, on a pair of iron trestles. This wide opening of the roof enabled pointings of the telescope to be made from 55 degrees north to 55 degrees south. Wide
double doors on the first floor opened outwards to the north and south, allowing the telescope to reach greater zenith distances and extending the possible observations to 76 degrees to the north and the south. The sensitivity of the instruments inside meant that the climate in the building needed to be controlled. There are windows on the east side of the building only; the lack of windows on the west is to prevent penetration of afternoon sunlight and the heating of the telescope. The line of Eucalyptus trees (planted circa 1920) added further protection against the sun. Today only two of these original trees remain.

The design of the building was a case of form following function. The pitch of the roof enabled it to slide open. The structure of external walls was made of off-shutter concrete columns and beams with buttresses to the east and west adding additional strength. The interior walls were lined with raw brickwork with an air cavity (for climate control) and then an external skin of rectangular precast cement blocks cast on site by Barrows Construction, designed to resemble ashlar Portland stone, which was fashionable at the time in Regency towns such as Bath or Cheltenham in England. Similar blocks were being made for the Great Hall, which was also being built at the time. The words “Yale Telescope” were cast into the lintel above the north door. The resultant building is an odd combination of English tradition, American inventive design and South African practical adaptability. The speed of construction, the practical utilitarian design and coincidental choice of materials suggests that no architect was involved. The design was probably imported by Schlesinger. He said it was economical and efficient.

The Wits Council committed itself to the construction of a single-storey residence, offices and photographic workshop for the director of the Yale Southern Station. This was about 20 metres east of the telescope building. The architects of this small house were Cowin and Williamson. The Council minutes for 1925 record an expenditure of £2 416.10.0 for the building, which was within the £2 500 budget. This home-cum-working space served, after the closure of the observatory, as the home of the Wits Music Department in the 1960s and 1970s before becoming the postgraduate club. It was unfortunately demolished in the 1980s to make way for the Moffat Extension, designed by Herbert Prins. It was only through Prins’s insistence that the Yale Telescope building itself was saved. The building was by that stage the home of Revel Mason’s archaeological research unit, contributing to another pioneering scientific research project.

The location of the astronomy research station was a fairly remote, quiet, undeveloped corner of the campus in the 1920s. Yale Road was then an unnamed perimeter road on the eastern edge of the Agricultural Society’s show grounds. The gum trees lining the road offered welcome shade and parking off the thoroughfare that linked Parktown West and Braamfontein, connecting the then newly surveyed Empire Road to the north with the Showground Road (now Enoch Sontonga Drive) and Jorissen Street to the south. It was on Schlesinger’s suggestion that it was named Yale Road.

In 1925 the American astronomer Harold Alden Heritage
(1890-1964) accepted the post of astronomer and director at the Yale Southern Station. He and Schlesinger spent a month testing the optical and mechanical parts of the telescope. Alden set about taking the thousands of photographic sightings and plates that the station was set up for. He held the post for 20 years, with his family growing up on the Wits campus. In 1945 he returned to the University of Virginia in the USA, where he became Professor of Astronomy and director of the Leander McCormick Observatory. Alden built his academic reputation on the measurements of stellar parallax, the proper motion of stars and long period variable stars, observed using the Yale Telescope at Wits. In his honour the crater Alden, on the far side of the moon, is named.

The post of astronomer was then filled by Cyril Jackson. The Southern Station was now jointly sponsored by the universities of Yale and Columbia and began to be used for more varied observations. Jackson moved to Australia and to Argentina in the early 1960s, following the changing structure of the Yale-Columbia programme. He later retired to his farm, Hilltop, near Haenertsburg in Limpopo.

In 1952, after operating for over 25 years, the telescope of the Yale-Columbia Southern Station was closed. The completion of the station’s programme, and the increased light and pollution in Johannesburg, made conditions for observation unfavourable. The 26-inch refractor was relocated to Mount Stromlo Observatory, 10km west of Canberra, now being associated with the Australian National University of Canberra. Jackson travelled with it to Australia to ensure its safe arrival. Sadly the venerable telescope, which had been a working instrument for nearly 80 years, was destroyed in a bush fire on 18 January 2003.

In spite of the loss of its telescope and purpose, the Yale Telescope building survived while other buildings were demolished to make way for newer developments on the campus. Though new floors were added into the volume designed to house the telescope and the sliding roof was fixed into place, it remains distinctive.

The close proximity of the Planetarium building to the north underlines Wits’ pre-eminence in South African astronomical studies. It dates from 1960 and was championed by applied mathematician and astronomer Prof Arthur Bleksley. The Planetarium, with its distinctive dome, has its front door on Yale Road. Under the leadership of the director, Dr Clare Flanagan, it conducts an important outreach programme for Gauteng schools. For many young people it is the first introduction to the University campus, often planting the seed of higher educational aspirations and the love of science.