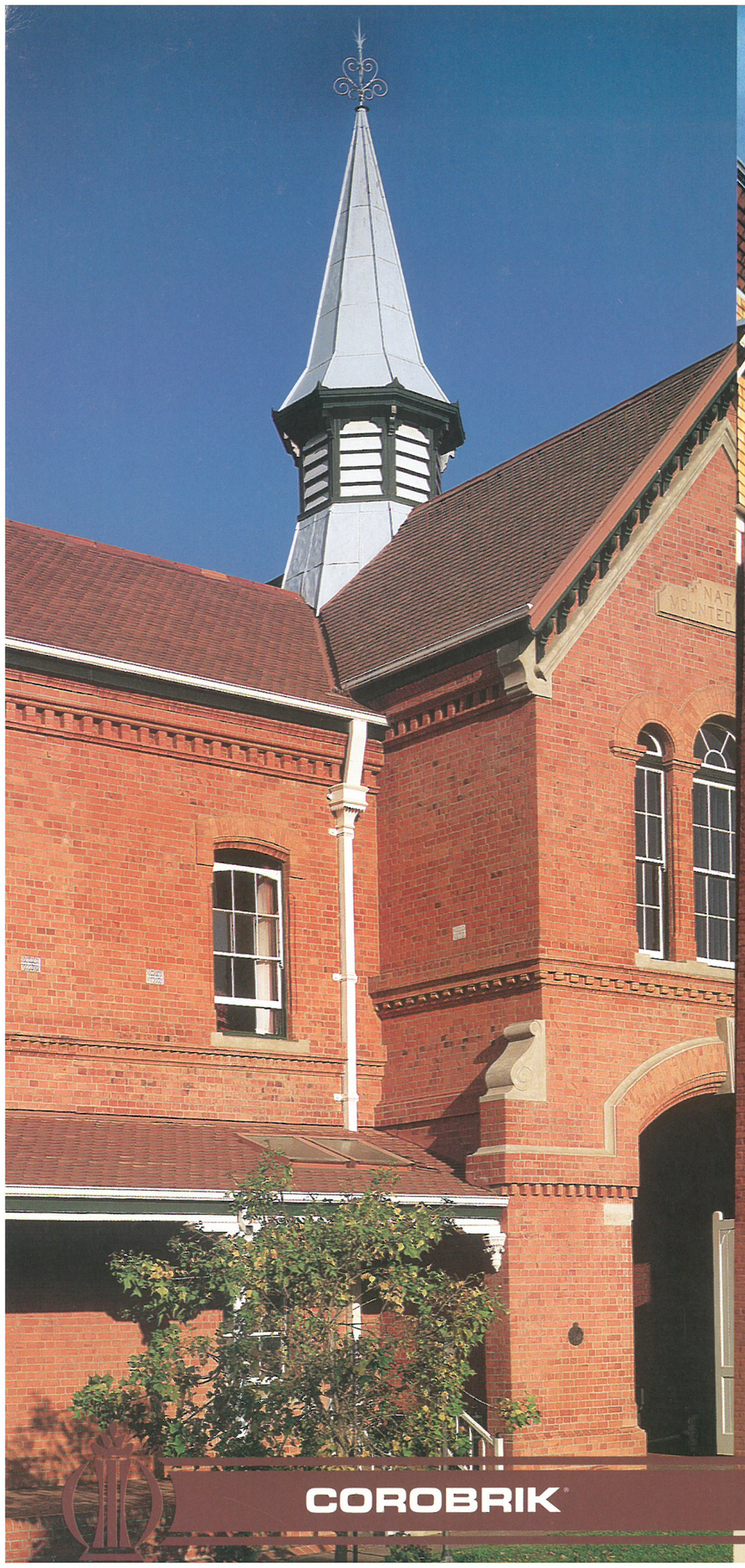

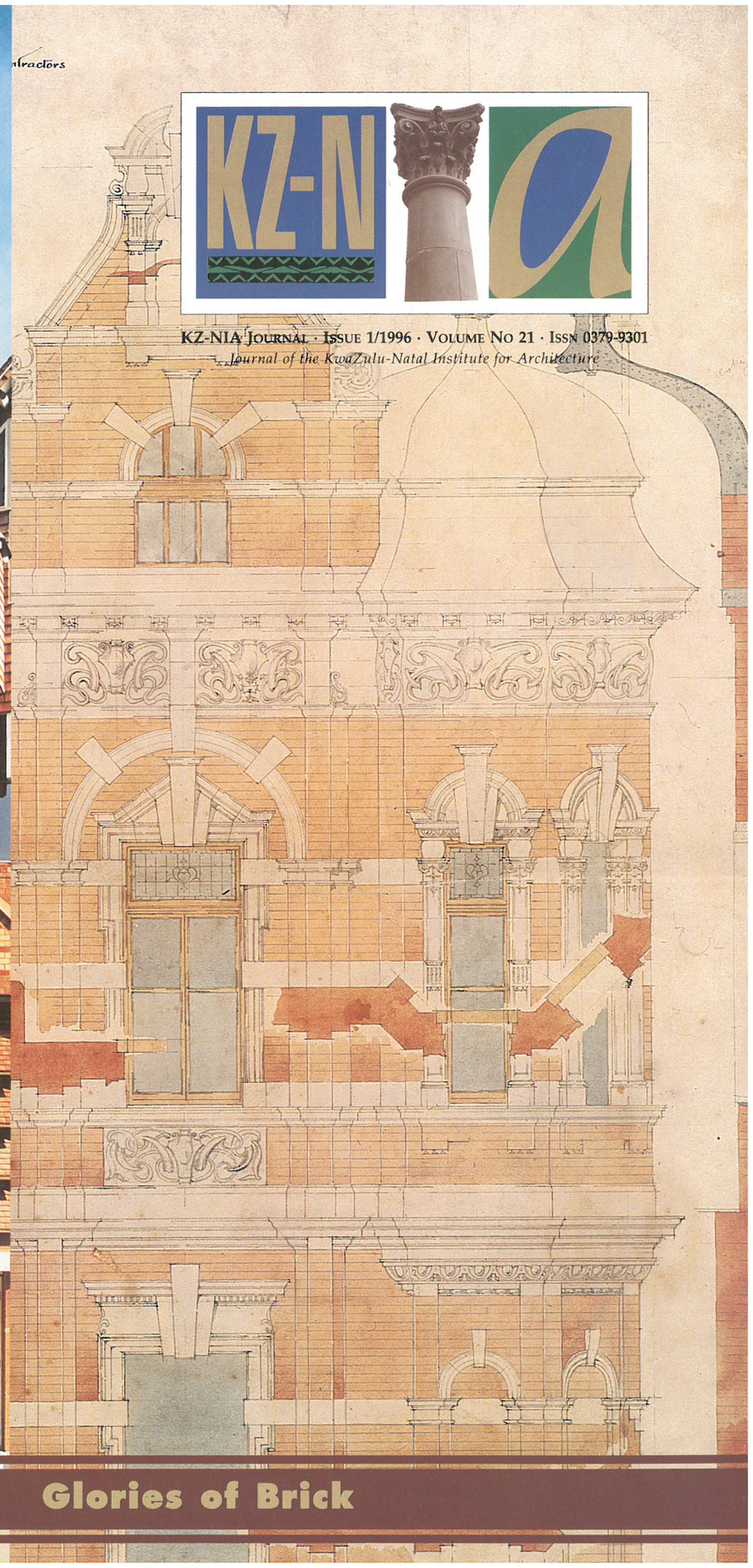

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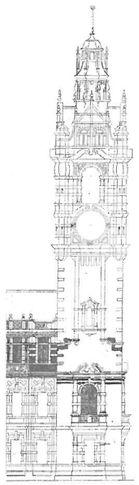


Glories of Brick

Milestones in Masonry

Pietermaritzburg City Hall

The Pietermaritzburg City Hall designed by William Street-Wilson and completed in 1901 is rich in design and craft skills and is undoubtedly one of the finest examples of face-brick load-bearing masonry construction of that period in Natal.

The decision by the municipality to use face-brick was probably based on cost. Locally produced salmon (pink) face-brick was of good quality, readily available, and considerably less expensive than the imported stone facings more commonly used in municipal buildings at that time.

The building has aged extremely well. Its durability may be attributed largely to its flemish bonded brickwork, its meticulous attention to detail: recessed windows with plastered surrounds, carefully detailed plastered brick mouldings and various features in the facade to protect walls and windows from the elements. The structure is generally quite simple. The almost symmetrical cellular arrangement of load-bearing brick walls around the main hall serves to subdivide the space for the various rooms and offices in the building and provides rigidity to resist wind and gravity forces. Other structural elements are in riveted structural steel, timber or concrete.

To achieve durability the design placed reliance on simple well-tested materials and traditional skills. Comparable durability in other more recent forms of construction which rely on high technology for their success is proving to be more difficult than is generally perceived.

Many of the very fine original drawings of the building prepared by Street-Wilson are held in the archives at the University of Natal, Barrie Biermann Architectural Library.

Harry May

Dr May is a partner in the consulting engineering practice of May Houseman & Associates, Durban.

Low-income Housing: Brick, the UK Experience

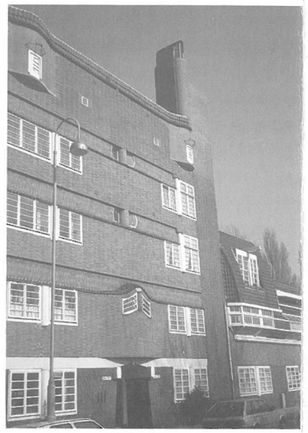
Britain has a long history of using bricks, and an extraordinary variety of types and forms of brick. The building of the great cities of the industrial revolution was possible only because of the mechanised production of bricks. With urbanisation came the pressing problems of slum housing and sanitation, and bricks were essential to the durable and good quality construction of low income housing, as well as of sewers. The first programmes of public housing, produced by the elected city governments, were developed in the 1890s. It is notable that these governments were very clear that there was no point in demolishing slums unless these were replaced with carefully designed and well constructed buildings, and a whole range of standards and design controls was established. Our Victorian predecessors understood that housing for low income people must be of the highest quality – both as an investment of public resources and because good physical surroundings were of benefit to residents and to all citizens.

In the succeeding century, British housing policy has often forgotten these first principles. The design of public housing and of the surrounding spaces has at times been reduced to minimum quality and mass production. The housing projects of the 1950s post-war reconstruction began to experiment with new, often little researched, materials and techniques. The mass housing projects of the 1960s and '70s, attempting "comprehensive renewal" of inner city areas, frequently used concrete frame and panel systems. These were often not well understood by the construction workers or supervisors, or by subsequent maintenance teams. We now have serious technical problems with many of these projects. This fascination for new techniques was shared by construction firms – which hoped thus to make higher profits; by architects – who are often tempted by technical innovation; and by politicians – who liked the symbolism of new technology "solving" the housing problem. The resulting high-rise and slab block forms have frequently created depressing urban environments. **Low income people were relegated to low quality buildings – not a successful formula.**

In the 1970s architects began to return to using brick, and to rethink the relations between density, building form and the layout of housing projects. Various forms of low rise/high density housing were developed, and more attention was given to quality. Some of these projects, built within the same cost limits and design standards as the "industrialised" ones, are clearly a better investment in economic, social and political terms. We were, perhaps, rediscovering the first principles established by the first public housing. Bricks, or any other traditional construction materials, are not in themselves a solution. Innovation is important but must be properly researched and tested. The understanding of appropriate building technology and the assessment of good value, as well as a refined sense of design, are essential skills for architects and policy makers. These are all the more important in the critical field of the production of economic and life-enhancing housing for low income people.

Hugo Hinsley

Hugo Hinsley is a lecturer in the Graduate School of the Architectural Association, London.



COVER: (left to right):

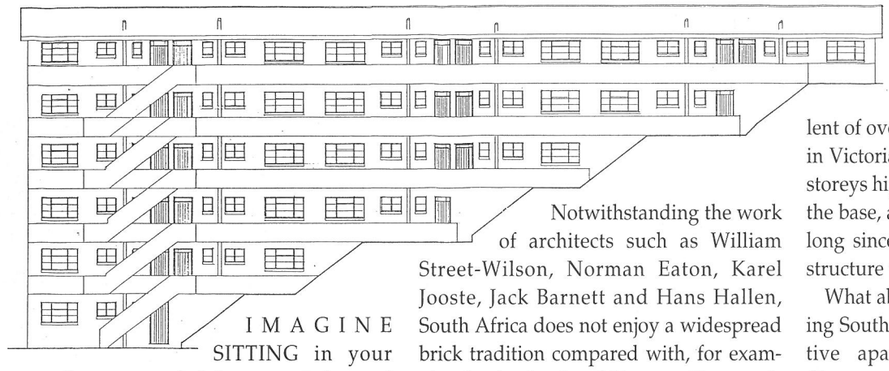
Alexandra Road Police Station, Pietermaritzburg, restored 1993/94. Replicated bricks and specials by *Corobrik*. Photograph: John Oliver, *Ashley Studio*

Queen's Building, De Montfort University, Leicester. Photograph courtesy De Montfort University.

Pietermaritzburg City Hall. Composite drawing of plan, section and elevation by William Street-Wilson, 1899.

Editorial

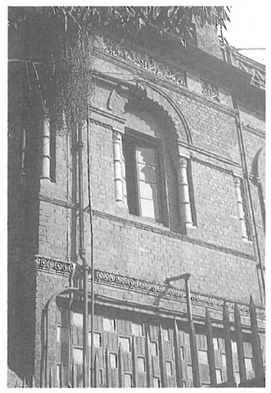
Glories of Brick

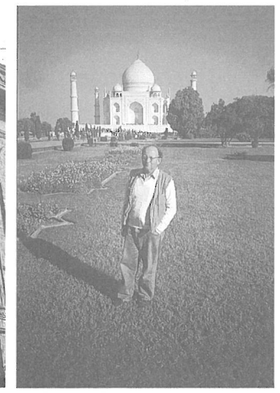


IMAGINE SITTING in your studio, surrounded by extruded metal sections, composite boarding, adhesives and gaskets. You are to receive a trade representative with an amazing product. It is apparently based on the dimensions of a hand, modular in all three dimensions, so that it can be formed into an infinite variety of shapes and patterns. It is formed of fired clay, a natural resource, and strong enough to support a multiple of storeys. Most importantly for your Professional Indemnity Insurance, it has a track record going back thousands of years.

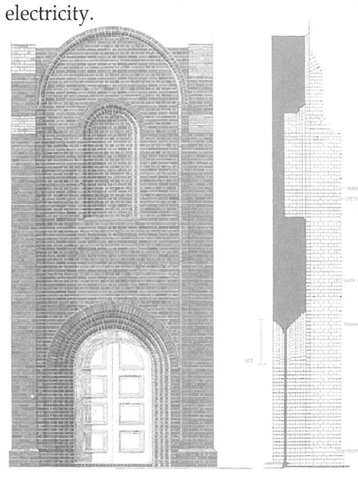
This edition is dedicated to that product, THE BRICK, and specifically to celebrate the Patron of Architecture Award conferred on *Corobrik* by the Kwa Zulu-Natal Institute for Architecture. For twenty-one years our Journal has been solely sponsored by this company. Ever since the first edition was published in 1976 and edited by Danie Theron, KwaZulu-Natal architects have been informed about the achievements and concerns of their peers in all aspects of architecture. Currently the Journal is distributed to all KZ-NIA members, and architectural practices nationwide, as well as to selected schools, provincial and local authorities and KZ-NIA friends. Sustained sponsorship for twenty-one continuous years is an achievement worthy of the award as Patron.

Notwithstanding the work of architects such as William Street-Wilson, Norman Eaton, Karel Jooste, Jack Barnett and Hans Hallen, South Africa does not enjoy a widespread brick tradition compared with, for example, the lowlands of Europe. Too much potential is lost in stretcher bond infill panels between concrete frames, often slapped in and concealed behind plain cement plaster.





One has to move abroad to recognise the full potential of brickwork. The thermal qualities have barely been scientifically explored in our country, living as we do in the false security of relatively cheap electricity.



During a trip to India, I was struck by the sheer size of the Taj Mahal, a loadbearing brick structure standing the equivalent of over twenty storeys. My apartment in Victoria Mansions, Calcutta, was seven storeys high with walls four bricks thick at the base, and although the fire escape had long since fallen into a heap of rust, the structure was fit to last another century.

What about our own setting in a changing South Africa? Structurally the innovative apartments for Mr Mbotho in Clermont, apparently designed by an African draughtsman, are a brilliant solution on very difficult terrain. With a cellular plan of brick loadbearing walls and thick slabs it is a viable solution for housing. The final product is one storey higher than the approved plan!

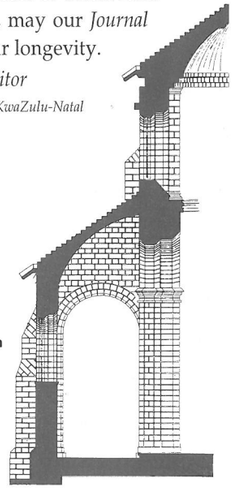
In this issue, appropriately, we focus on the glories of brick, and to underscore the focus, we have invited contributions from national and international colleagues to whom I am most grateful. Perhaps not surprisingly, the message conveyed in all these contributions is that in an era where the budget for maintenance may cease to exist, durability, or the time-life-cycle cost, remains the principal asset of brickwork. And, like that material, may our *Journal* be blessed with a similar longevity.

Rodney Harber, Guest Editor

Professor Harber is President of the KwaZulu-Natal Institute for Architecture.

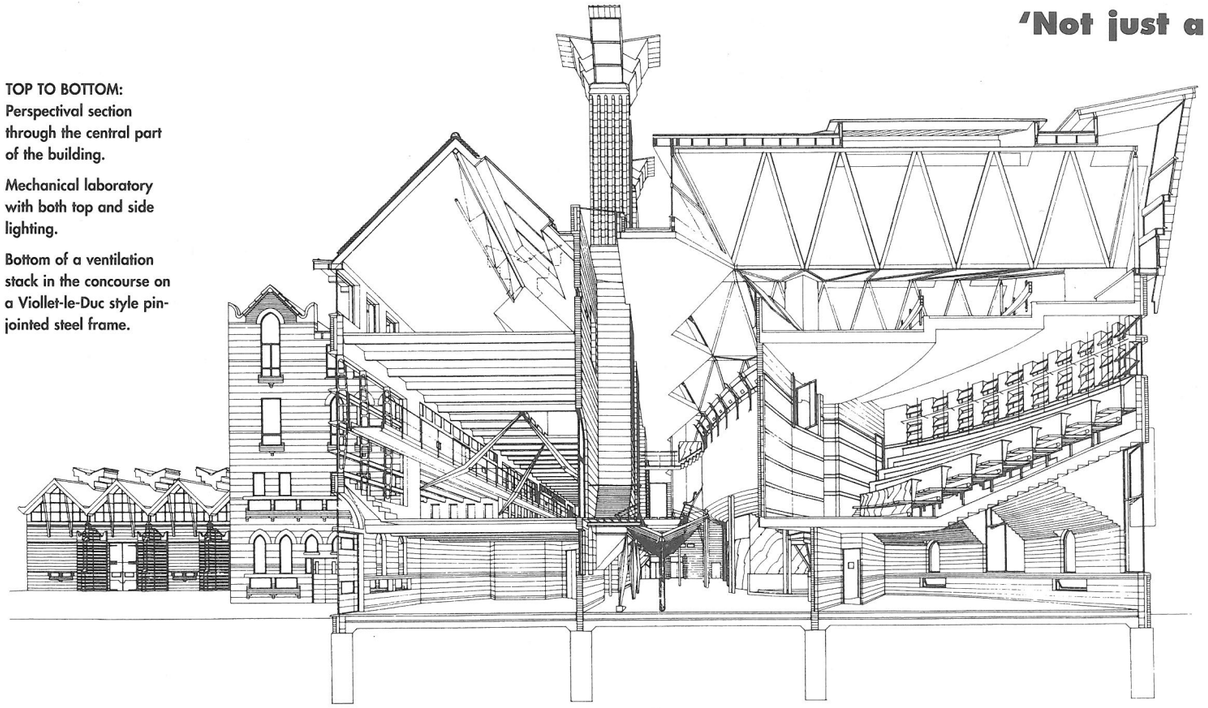
TOP: Side elevation of a loadbearing brick apartment building for Mr JJ Mbotho in Clermont Township, 1983, by Thomas Nkuna. Estimated cost R600/sq m.

Measured and rendered drawing project by 2nd year students of 1996. Parish church of St John the Divine, Clark Rd, Durban, 1925: Elevation and section of side entry (left) by Shaun Gannon; section through ambulatory (right) by Simphiwe Mashaba.



Glories of Brick

'Not just a pretty face'



TOP TO BOTTOM:
Perspectival section through the central part of the building.

Mechanical laboratory with both top and side lighting.

Bottom of a ventilation stack in the concourse on a Viollet-le-Duc style pin-jointed steel frame.

Queen's Building, De Montfort University, UK

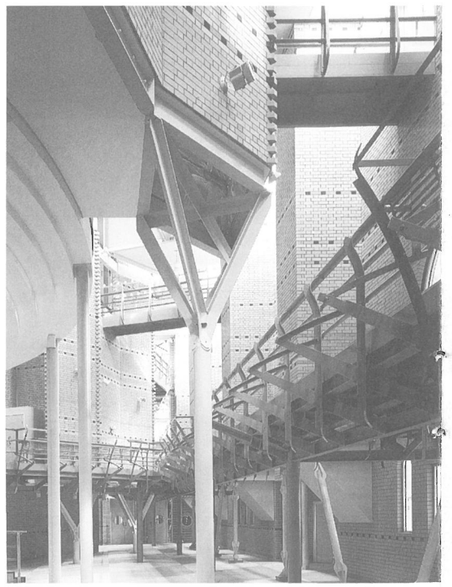
The strange looking creature which landed on De Montfort University, Leicester campus, in late 1993 is no ordinary brick building.

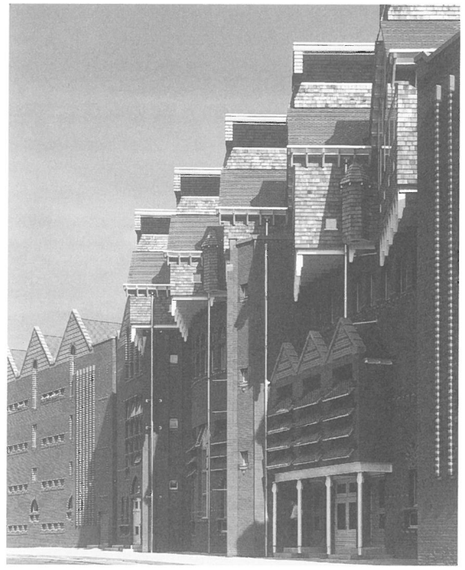
It manages to give a reassuring nod of recognition to its location – a red brick industrial (and University) city in the English Midlands – whilst at the same time making a provocative display of forms and high technology using familiar materials.

Queen's Building provides new accommodation for the School of Engineering and Manufacture (mechanical, electrical and general engineering). But the brief asked for more than simply a place to house laboratories, workshops, lecture theatres and staff offices. This was intended to be a flagship building for a new university which said something of the University's ambitious plans. London-based architects, Short Ford & Associates, were chosen for their 'green' design credentials and asked to provide a low cost, low energy building effecting a marriage of innovative design principles and traditional materials. The result is an astonishing display of ingenuity which more than fulfilled the requirements of the brief.

By breaking down the accommodation into narrow, linked elements all with access to natural light and ventilation, it has been possible to create a l0,000sq m building which is almost wholly naturally conditioned. Less than 2% of the floor area is mechanically ventilated or air conditioned.

An essential component in the passive environmental design strategy is a 50m long x 4 storey high atrium which not only helps compress circulation to 16% of the total floor area but also acts as an air plenum, heat sink and light source; ventilation stacks rise through the perimeter walls of the spine supported above head height on Viollet-le-Duc style pin-jointed steel frames, drawing in fresh air across classrooms. Even the two 160-seater auditoria are ventilated naturally, utilising stack effect and air buoyancy from warm bodies.





Another essential component in the environmental strategy is **the use of bricks as a massive thermal sink**. Insulated walls 420 mm thick with bricks inside and out provide thermal stability. In tests carried out during June of 1994 **when external temperatures of 31°C were recorded, the internal temperature remained around 23½°C**. The combination of mass and ventilation has proved effective in fending off over-heating – even better than computer thermal models had predicted – in a building characterised by its heat-producing characteristics (the electronics laboratories may generate 84 Watts/sq m from computers – three times that in a traditional office building).

600,000 bricks were used in the construction of the building. At one point, there were 120 workers on site, the majority of whom were bricklayers – seen by the University as a positive asset at the height of an economic recession.

The masonry is all load-bearing. Although the building is 4 storeys high, a framed structure has been avoided by using reinforced flemish bond brickwork with expansion joints. Collar-jointed walls packed with mortar tie through the 212mm insulated cavity.

External walls have been designed as planes of pink brickwork inspired by HH Richardson at Harvard with flush Tilcon-tinted mortar to match. Blockley's Mellow Grain Heritage Bricks (partly hand made) from Shropshire are used with contrasting silver, buff and deep red syncopated stripes.

Internally, load-bearing pastel-coloured calcium-silicate bricks are used to help reflect light from various sources. Ivory, white, cinnamon and dark blue Ryarsh bricks from Kent are set in flemish bond or collar-jointed to fairfaced blockwork walls. The precise machine-made effect inside contrasts with the irregular hand-made appearance outside.

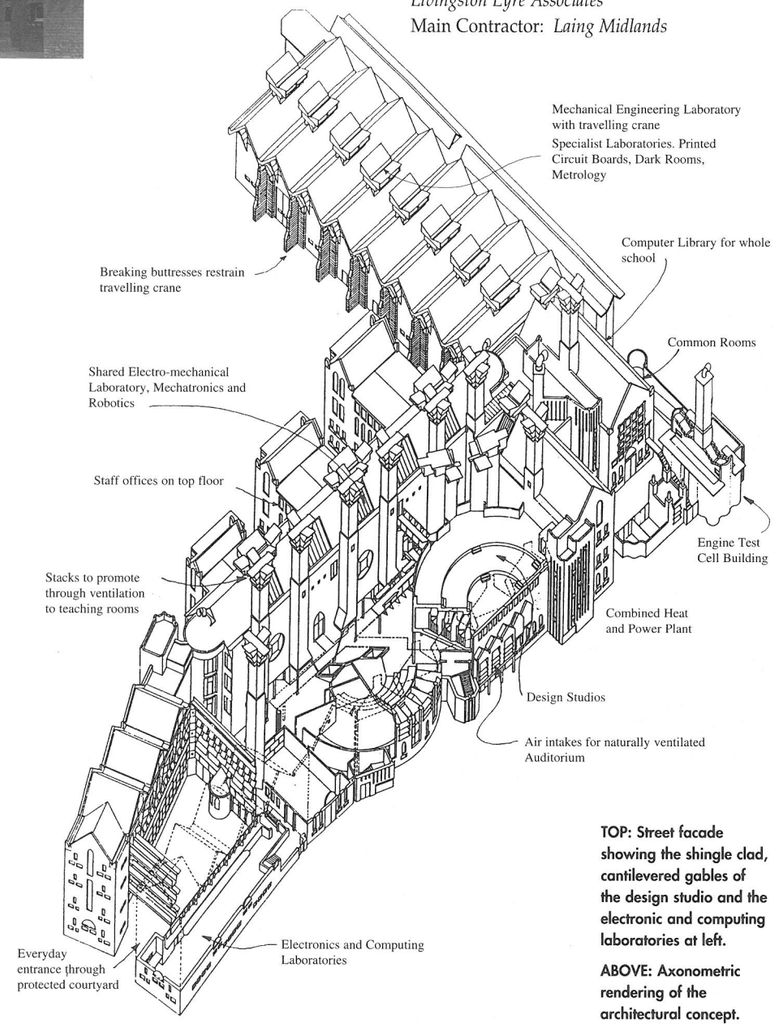
So this strange-looking creature which reveals the familiar in an unfamiliar way has strongly functionalist origins. The high pointed windows, ventilation stacks, masonry construction, north lights and fragmented plan form are all there for a good reason, not gratuitous display. Its contemporary urban statement belies some old-fashioned principles forgotten by some of the occupants who have to be taught to open windows or ventilation panels and turn off electric lights, having grown up in an age of mechanically-controlled, sealed buildings. *Plus ça change. Plus c'est la même chose.*

The building was opened by Queen Elizabeth II in November 1993.

George Henderson

Professor Henderson is Head of the Department of Architecture at De Montfort University, Leicester

Architects: *Short Ford & Associates*
Client Clerk of Works: *Michael Moate*
Structural Engineers:
YRM Anthony Hunt Associates
Quantity Surveyors: *Dearle & Henderson*
Mechanical and Electrical Engineers:
Max Fordham Associates
Landscape Architects:
Livingston Eyre Associates
Main Contractor: *Laing Midlands*

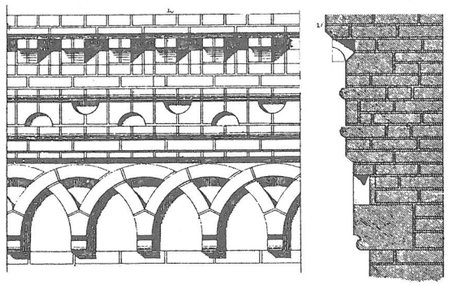


TOP: Street facade showing the shingle clad, cantilevered gables of the design studio and the electronic and computing laboratories at left.

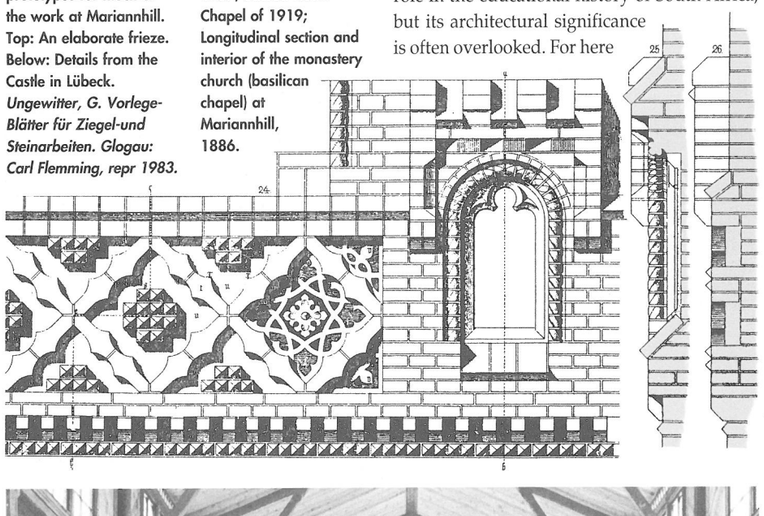
ABOVE: Axonometric rendering of the architectural concept.

Glories of Brick

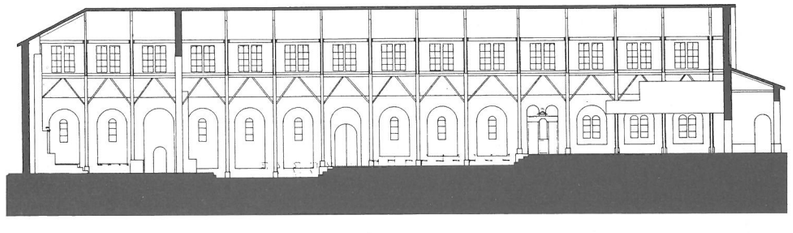
The Bricks of Mariannhill



Brick details as found in the book of 1865 by GG Ungewitter, Architect, could have provided the prototypes for much of the work at Mariannhill. Top: An elaborate frieze. Below: Details from the Castle in Lübeck. *Ungewitter, G. Vorlege-Blätter für Ziegel-und Steinarbeiten. Glogau: Carl Flemming, repr 1983.*



FAR RIGHT CLOCKWISE: Campanile of monastery church as seen from the cloister; Gatehouse of 1907; Sacred Heart Chapel of 1919; Longitudinal section and interior of the monastery church (basilican chapel) at Mariannhill, 1886.



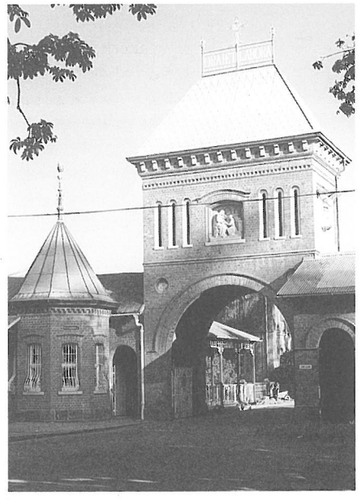
Dotting the hills to the west of Durban is a gently rambling complex of churches, shops, houses and schools, expressed on the skyline by a picturesque ensemble of spires and cupolas. This is Mariannhill, the influential monastic community established in 1882 by a hardy band of Trappist monks from central Europe. Mariannhill plays an important role in the educational history of South Africa, but its architectural significance is often overlooked. For here is the finest group of brick buildings in South Africa, an unparalleled example of the translation of nineteenth-century German architecture to this country.

To understand Mariannhill is to understand brick architecture. Brick is the natural building material of any alluvial plain, just as stone is the natural material of uplands and mountains. Wherever fine silt and clay deposits are available, one can build in brick. The architecture of Northern Europe, the plain that runs from Holland through northern Germany into Poland and beyond, is a wide swath of brick buildings. In the Middle Ages brick architecture blossomed here, particularly in the great Gothic churches built along the shores of the Baltic Sea. But after the sixteenth century, in the course of the Renaissance, brick became devalued as a material. No longer appreciated as a monumental material, it was used as a humble utilitarian material, to build cheaply. Where brick was still used, the tendency was to deny its nature, using it as if it were stone, or hiding it behind a lather of stucco or plaster.

One of the first to revive the material was the great architect Karl Friedrich Schinkel (1781–1841), but even he saw brick in characteristically frugal Prussian terms, arguing that it should be used visibly, without stucco – not for nationalistic or dogmatic reasons, but because this forced the bricklayer to make cleaner joints. All this changed in the nineteenth century, the great century of materialism. The dogma of truth in materials was popularized in Germany by Heinrich Hübsch in his celebrated 1828 book *"In welchem Style sollen wir bauen?"* (In which style should we build?) For Hübsch, the forms of architecture needed to be derived from the physical properties of the materials. Germany, poor in marble, could not hope to match Greek architecture, with its daring post-and-lintol construction. Instead of great slabs of marble, architects had to work with smaller blocks, either sandstone or brick, and had to cap their openings with arches. Now the legacy of the great Hanseatic brick cities, of Lübeck, Rostock and Stralsund, was raked over eagerly, avidly, for inspiration. The centre of this brick revival was Hanover, Germany, whose Polytechnical School sent its students all over the world, from Sweden to Argentina to the United States. But perhaps nowhere was this German version of the round-arched brick style replicated so faithfully, so consistently and so ingeniously, as at Mariannhill.

By its nature, brick architecture lends itself to a religious community in a colonial environment without an industrial infrastructure. Brick has the advantage of being made on site, and of not requiring skilled stone cutters or sculptors. Finally there is the advantage of formal expression: brick architecture permits great richness of plastic expression with relatively simple means. With brick the plane of the wall can dissolve into a mass of receding planes, projecting cornices, corbels, panels and piers, decorative friezes, zig-zags and sawtooth courses – all constructed through the manipulation of the joint and the bond itself. There are restrictions, of course: unlike stone architecture, events in brick must occur in increments of a few centimetres, and projections likewise corbel out a few centimetres at a time. But brick architects made a virtue out of these limitations. They learned to manipulate the bond, to appreciate how brick structures resolve themselves into regular horizonal courses, and to find in the wall a metre and a rhythm equivalent to that of iambic pentameter: a fixed structure within which rhythms can develop freely. All this produces a different character than that of the fluid contours of stone carving – and it requires a different ornamental eye.

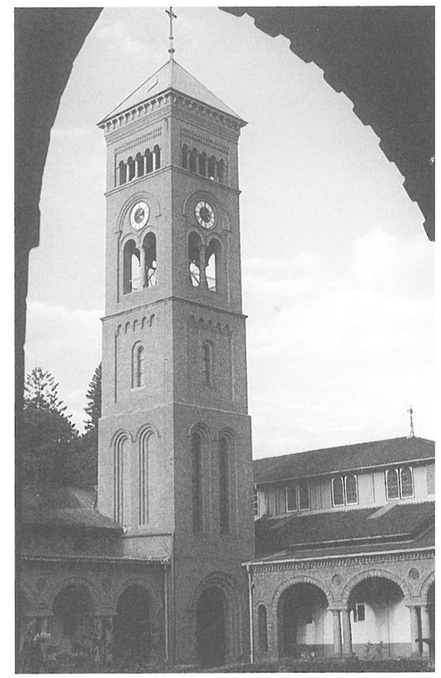
At Mariannhill that eye developed rapidly. The original basilical chapel of 1886, when the settlement was still rigorously Trappist, initiated the development. In form this was a conventional medieval basilica with a square apse and a narthex porch, but with a few special features. Within the masonry walls was inset a light timber construction for the nave arcade, with the character of utilitarian construction, like that of a contemporary railway hall. Also striking was the articulation of the floor in three horizontal levels, giving a tiered auditorium for the cloistered monks.



But the expressive possibilities of brick were scarcely realized in the basilical chapel, and only the rather severe corbel cornice showed a playful hint of freedom. This was still an architecture of massive walls, not yet conceived in the language of receding and projecting brick courses. Important features, such as the plinth, were executed in the fine grey-blue sandstone of the region. Even the brick itself, in comparison to later work, was rather crude. It was a coarse-grained ruddy red brick, somewhat soft, and was bonded with thick mortar joints. But a decade later the quality had improved remarkably, the brothers learning by experience. Workshops, residences, schools all followed in quick succession. There now arose that hard-fired brick, in hue rather orange, that became the characteristic material of Mariannhill.

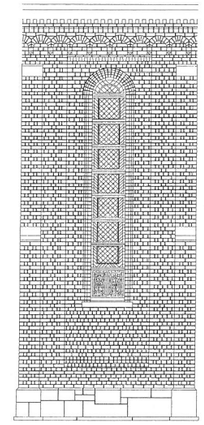
After the turn of the century, Marianhill entered its heroic era of architecture. Now administered by the Mariannhill Order, which succeeded the Trappists in 1909, the community developed its own formal language in a few key buildings, chief of them the cathedral, the cloister and attached campanile, the gatehouse (1907), and an octagonal memorial chapel. In these buildings unfolded a rich and confident architectural personality. Brick was used consistently in a system of richly articulated pilaster strips, recessed panels, and corbel friezes, dividing buildings into a regular system of bays. But most distinctive was the stylistic character of the buildings themselves, which was based on the Lombard architecture of late antiquity and the Dark Ages.

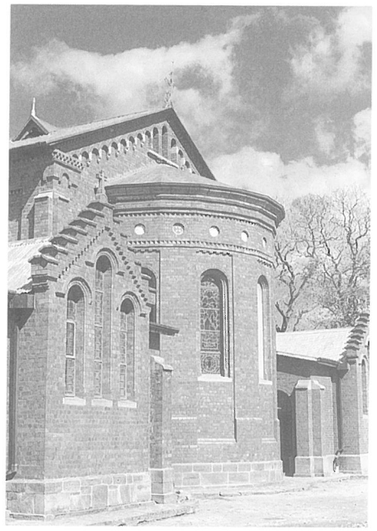
The round-arched architecture of Mariannhill was not the Gothic architecture that one might expect from a pious religious community nor even the rich Romanesque of German monasticism. Rather it referred back to a still earlier form of Christian architecture, and a decidedly more primitive one. This was in keeping with the nineteenth-century understanding of history, which viewed architectural styles almost as living organisms, which progressed in phases from early crude vitality to sophistication and maturity, and finally to over-elaboration and refinement. Protestant pietist groups in the United States turned to Early Christian architecture in the nineteenth century as part of this same impulse to revive the spirit of the Christian church during its formation.

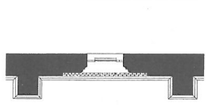


By this model, the appropriate architecture for a colonial society in somewhat harsh surroundings would be an Early Christian model, evoking the piety and sense of community of the early church. Its charactcr would be based not on elaboration or refinement, but rather on vigorous forms, honestly and simply used – much wall surface, few and small openings, and a very restricted use of ornament, most of it based on geometric forms. Surely the finest Lombard element is the striking campanile at the corner of the cloister, rising through a series of arcaded stages to an open bell tower.

Lombard architecture also suited the climate of South Africa better than German architecture would have. Quickly the Mariannhill brothers became adept at building for the climate, as the Cathedral shows. This is the principal building of Mariannhill, a two-towered hall church with a robust array of polygonal apses. The blinding light of African summer required a reduction in size and number of openings, even more than in a Mediterranean climate. On the other hand, the light roof construction of Africa, and the absence of masonry vaults that would require buttressing, meant that the walls would be nothing more than sheer planar surfaces, relieved only by tiny openings. Another architect might have tried to torture a Gothic plan to fit local conditions, shrinking the windows while keeping the other elements at the same scale, but instead the Mariannhill architects reinterpret-







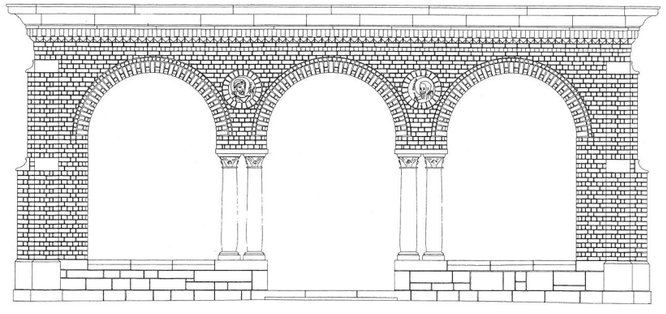
St Joseph's Cathedral, Mariannhill. Clockwise: measured drawings of side bay by Louw & Yeo, 1976; details of east end; Narthex porch elevation drawn by Hallen & Spencer, 1976; and the twin-towered west end.

ed the spirit of Lombard architecture, adjusting the relationship of wall, window and pilaster. Broad plaster strips containing blind arches articulated the walls into a richly modeled set of receding and projecting planes. The result was a wall animated by cast shadows, producing the effect of solid and void without the need for massive openings. Seldom has the spirit of another place been translated so satisfyingly into colonial architecture.

The buildings of recent years have continued to follow Mariannhill's strong tradition of building with brick. Completed only after the second world war, the cloister is one of the gems of South African architecture – a completely vaulted cloister with handsome domical vaults, ornamented by terracotta rondels, some designed and executed by the brothers. In these haunting allegorical panels, which in their expressive vigor recall Lombard or Byzantine ornament, the use of brick and ceramic at Mariannhill reached its peak.

During the apartheid era the teachers' training college and the curricula of the schools which were the heart of the Mariannhill mission were forcibly reduced, and now the community languishes somewhat. Still, it preserves with wonderful clarity the character, scale and the sense of place of its nineteenth-century origins. Mariannhill is a monument of colonial architecture, but it is something more. It is an achievement of world architecture, where the architecture of nineteenth-century Europe, with all its sweeping dogma of history and materials, contended with Africa in all its richness and complexity, to produce something vital and novel in its own right. At Mariannhill, when the children have settled in their classrooms and the grounds once again grow still, it is possible to experience it as it should be experienced, and to sense there an axis bridging Europe and Africa, the present and the Middle Ages, and sophisticated architectural theory and humble human labor. There is nothing like it anywhere.

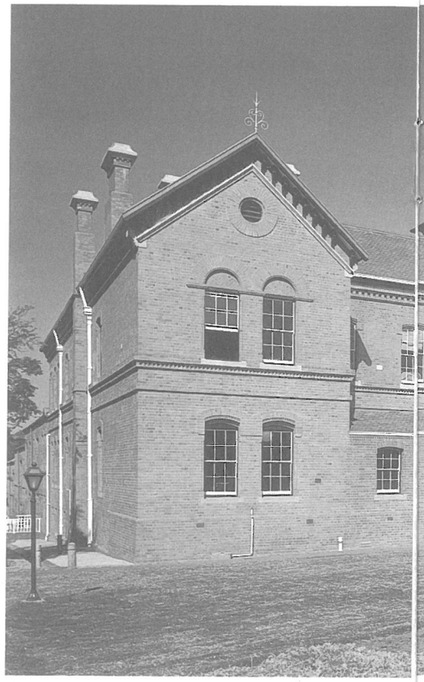
Michael J Lewis

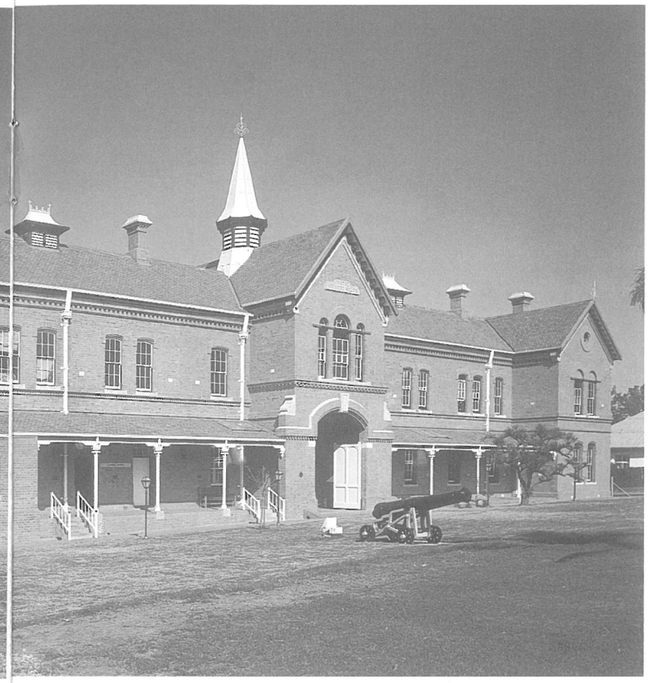


Dr Lewis, Assistant Professor of Art at Williams College, Massachusetts, visited the Natal School of Architecture during August and September 1995 under the auspices of the Students Visiting Lecturers Trust Fund of the University of Natal.

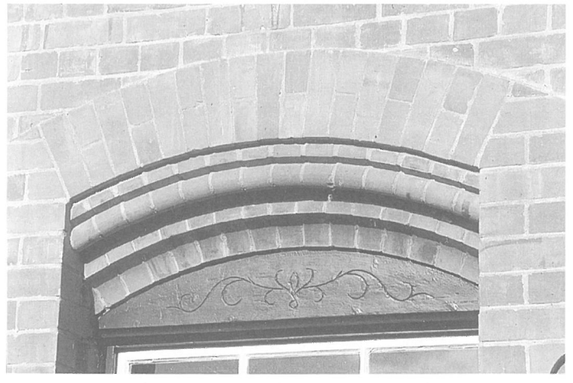
Glories of Brick

Brick restoration and replication





ABOVE: View of main building from Alexandra Road.
BELOW: Details of purpose-made replicated brickwork. Voussoir bricks to the hood; and the segmental arch composite of both roll and gorge moulded bricks.



Alexandra Road Police Station, Pietermaritzburg

The Alexandra Road Police Station in Pietermaritzburg consists of a series of buildings concealed from sight by the imposing triple-gabled front, the central gable of which marks the entrance tunnel. As the building began its life as barracks for the Natal Mounted Police, the concealed buildings include what were formerly coach houses, stables, forage rooms and accommodation for stablehands as well as an officers' lounge and a mess room. The main building has a U-shaped plan the wings of which were designed as stables. Albert Henry Hime who had become colonial engineer in 1875 was the designer and the building was executed with "numerous disruptions" during the years 1878–1890. According to Kearney, the verandas were introduced in the course of the work but the original plans were carried out without material deviations (*Architecture in Natal 1824–1893*, p56).

A century later the Department of Public Works commissioned Messrs Interplan Architects with the restoration of the buildings. Due to innumerable alterations over many years, the first task was to prepare a series of measured drawings, to document the condition of all structures and to search for archival material including historical photographs.

One of the restoration problems concerned the deterioration of facebricks and in order to match the original in size, shape and colour, samples were removed from the building. *Corobrik* prepared special moulds and embarked on the manufacture of the special bricks on Saturdays, so as not to affect normal brick production. The contractor in turn procured a mortar to match the existing in composition, strength and colour. Due to this response, Victorian chimneys which featured on historical photographs could be reinstated. For these the contractor first dry-laid the special bricks on the ground. Similarly, new Broseley roof tiles for the main roof were specially manufactured by *Corobrik*. Tiles still in a reasonable condition were donated to the National Monuments Council, KwaZulu-Natal region, for storage in their building materials bank until an appropriate application is found.

As noted by the conservation architect, Brian Summerton, "These buildings can now remain for, may I say, another 100 years, if proper preventative maintenance is carried out on a regular basis".

Client: *Department of Public Works*
Architects: *Interplan Architects*
Electrical Engineers: *Biderman Finn Beekhuizen & Associates*
Quantity Surveyors: *Barnard Botes & Brink*
Contractors: *Gordon Verhoef & Krause*

FAR RIGHT: Detail of the roll bead bricks to the window reveal.

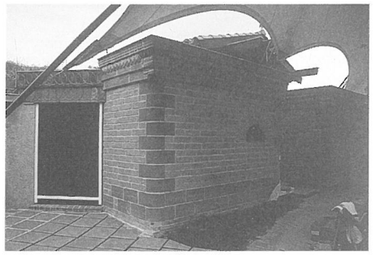
RIGHT: Detail of the modillion and dentil frieze.

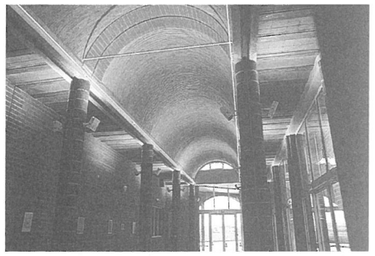
BELOW: Details of frieze; window hoods and reveals; and the dog-toothed belt course.

Photographer: John Oliver, *Ashley Studio*

Glories of Brick

Earth building – From Cape to Cairo and further





What can it be that the Cape and Cairo have in common, except to be on either ends of our continent, in the north and in the south? One significant shared aspect is that both have built their traditional buildings with earth. The ancient Egyptians obtained the mud that they mixed with straw from the alluvial banks of the Nile. The earth/straw mix was then formed into bricks and placed in the sun to dry.

In the Cape a similar process was used. Cob and adobe (a sundried brick of clay/sand) was common in the Cape at the beginning of the settlement.[1]

The use of earth as a building material and construction technique is well known all over the world. From the earliest times it was used by the Romans and the Muslims in the Middle-east, Africa and Europe. There exists enough archeological proof for this.[2] These historical examples are well known to us, but in the past few years a lively interest in earth as a modern material and technique has developed.

In the recent past, this age-old construction technique has been transformed through thorough research and the application of scientific methods and innovative experimentation. Continuous research is being done in the United States and in France. Research regarding the composition of new mixes, modern production techniques and application in modern contexts, has lead to the creative use of the material.

Earth Technology:

Earth can be used in many different ways. Twelve different techniques have been identified. They are broad types, and variations on these themes occur in different areas of the world. Some of these types are the following:

- Cob or adobe: sun dried bricks
- *Pisé de terre*: rammed earth
- Extruded earth: like today's brickmaking
- Wattle and daub
- Compressed Earth Blocks (CEB): the latest technique, very much like a facebrick – and suitable for modern construction.

Most of these systems have benefited from an industrialised process and modern application.

The performance of most of the techniques has been tested. Water resistance or penetration can be controlled, the strength of the materials can be controlled, and also the quality of the product. Standardised tests have been developed that can be performed on the product to guarantee good quality. Earth also has good thermal properties. This is something that we have to consider seriously in the South African climate. The different techniques can also be adapted to the different regions of the country, wet or dry, and used by small entrepreneurs or big construction firms.

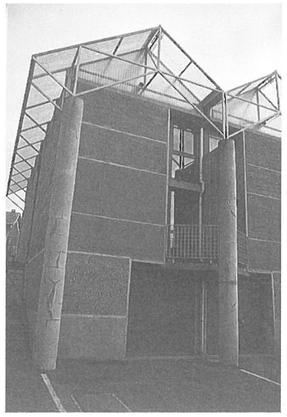
A few modern examples will show the versatility of the material across the world.

Egypt: New Gourna, Luxor, by Hassan Fathy

Fathy can be called the father of modern earth construction. He spent three years of his life building the village of New Gourna, from 1946-48. He used adobe bricks as the main building material for all the buildings, public and private, for walls and roofs (domes and vaults). Fathy used clay as a building material, because it was easily available, it was cheap, and the skills to build were available or could be taught. He used earth, because it was an appropriate technology for the place, the people, the climate. The village was never finished; some buildings are today still in a very good condition, eg. the mosque after almost 50 years. It was this work that really started the interest in modern earth architecture.[3]

France: Domaine de la Terre, Isle d' Abeau

The Domaine de la Terre is by now a well known example of modern earth architecture. It was an experimental project and was completed in 1985. It is a village of social housing built of earth which has proven its technological pertinance and its architectural potential in the modern world. Three techniques were used: rammed earth, vibro-compacted stabilised earth blocks and a straw-earth mix. The project also experimented with economy of energy by using different devices to make use of natural ventilation and heating.[4]



ABOVE: Isle d'Abeau – Domaine de la Terre. A rammed earth house.

LEFT TOP TO BOTTOM:

House near Toulouse, France. Architect: Colzani. Red fired quoin, plinth and cornice bricks; the yellow infill is of compressed earth blocks (CEB).

Technicon in Toulouse, France. Architect: Colzani. The vault is built of CEBs.

The mosque at New Gourna. Architect: Hassan Fathy

All photographs by the author.

Conclusion

If earth can be used all over the world, in arid zones, tropical and wet European weather areas, then it will be irresponsible of the South African building industry not to consider it seriously. **The University of the Orange Free State has tackled this challenge by establishing a Unit for Earth Construction within the Department of Architecture.** The activities of the Unit will start in all seriousness by 1996. Three people have already received training in France at the world renowned CRATerre (International Centre for Earth Construction). The staff of the Unit eagerly await any interest, advice, aid, information or questions.

In a country like South Africa, where the housing shortage is of such dramatic proportions, earth has become a very important alternative. In many African countries, it is not an alternative any more, but the only alternative.

Petria Jooste Smit

Mrs Smit is a Senior Lecturer in Architecture at the University of the Orange Free State.

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3. Fathy, H. 1969. *Gourna, a tale of two villages*. Guizeh: Foreign Cultural Information Department. (Prism Art: Series 4).
4. l'Isle d'Abeau: 'Le Domaine de la Terre', in *Project Monograph* (1): 1–8, 1987.

OBITUARY
Gordon Small 1927-95
A Noble Eccentric

While it is not normal procedure to duplicate obituaries, the Editorial Board felt this sincere tribute by Peter Melvin would be of interest to our readers.

ANOTHER giant has died. Gordon was Small by name but not by nature. He was larger than life but beneath a somewhat theatrical personality and a magnificent mane of hair lay a deep commitment to the Arts and Architecture and to his family and society.

As a European observer of the South African scene I have been interested to the point of occasional fascination in the way certain people, particularly those prominent in their field of endeavour, came to terms with apartheid; Gordon Small is an important person in this context as well as in other ways.

I first met Gordon in February 1980 at Johannesburg airport at an ungodly hour in the morning. It proved to be revealing in several ways. Here was a man, who from the distant view of a limply held banner displaying my name, a drooping head hidden by a cascading mass of hair and a large figure reclining in a crumpled suit, who was not a typical South African early bird and who was endowed with powerful body language. The toss of his hair and the almost camp wave of a hand that was so small in relation to his figure, were ways by which he communicated his feelings on many subjects; gestures as characteristic and recognisable as the Chaplin walk or those of Laurel and Hardy.

On his home ground in Pietermaritzburg he revealed an ability to be at ease with fundamentalists of many beliefs, liberals of varied persuasions and the many people of different colours that passed through his daily life. He revelled in small town politics and never lost an opportunity to send up pomposity particularly when it was generated by government decree. The flying of the Union Jack outside the Pietermaritzburg Club throughout apartheid is one such case in which Gordon figured.

Even when times were hard he never failed to fulfil his many commitments, to be generous or to retain his somewhat extravagant life style. I well remember him saying, with a toss of his hair and wave of his hand, that his overdraft was so large that the bank would not dare to foreclose but rather give him lunch to demonstrate confidence in their investment.

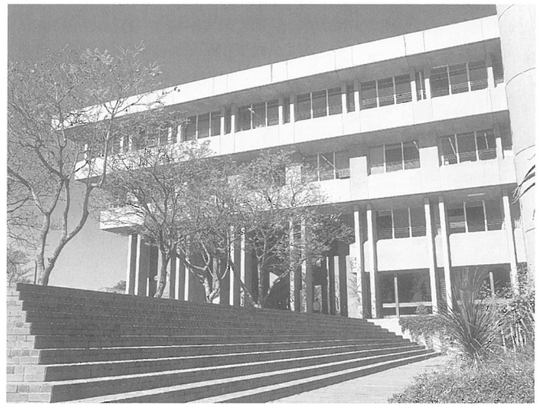
Other aspects of his endurance will be confirmed by those fortunate to have accompanied him on exhaustive walking tours of his beloved Pietermaritzburg, or experienced working with him to a design deadline sometimes over several days and nights. An example of his generosity and endurance of another kind was displayed by his reply to my suggestion that half a bottle of wine per person was the party norm. "No dear boy" he replied "two bottles per person are necessary to ensure success."

During the 1970s and 80s it was my impression that Gordon's architecture was regarded as not quite the best in South Africa. Any preoccupation with the modernist solution was already being criticised and this was a convenient way of labelling his output. A visit to his house however calls for a deeper reading of his buildings, dispelling the view that he was in any way riddled with modernist dogma. The brilliant conversion of the Durban Playhouse from cinema to theatre is a worthy testimonial to his understanding of the performing arts and his commitment to perfection, rivalling even Covent Garden in the final flourish of curtain closure as performances end.

But with the passage of time reassessment reveals a grace and elegance in his modernism which places the best of his work ahead of his peers. In this respect I commend the Arts Faculty building, the new Supreme Court and the conversion of the old Court House to house the Tatham Gallery, all in Pietermaritzburg.

In summary it was Gordon's refusal to be inhibited by politics, his caring and optimistic individualism that enabled his creativity to flow in the hostile world of apartheid. He was an English speaking liberal with a South African passport. South Africa has lost a noble man; an eccentric, theatrical and sometimes eclectic personality whose contribution to the Arts and Architecture will be held in increasing esteem.

Peter Melvin, Hertfordshire, UK



Faculty of Arts Building, University of Natal, Pietermaritzburg: ISSAA Award of Merit, 1977. Architects: Small, Petit & Baillon; photographer: John Oliver.

DURBAN CENTRAL TRANSITIONAL SUBSTRUCTURE COUNCIL:
1996 Conservation Awards

At a civic reception in the Jubilee Hall held on Thursday, 16 May, Conservation Awards were made to the property owners who had the insight to preserve, restore or recycle the following buildings: 330 and 334 Windermere Road; 14 Waverton Road; 376 Ridge Road; 17 Overport Drive; 35 Canterbury Grove; 461 Berea Road; Durban Light Infantry Regimental Headquarters; and the MOTH Dan Pienaar Memorial Centre.

COROBRIK Student of the Year

Winner of the 10th national *Corobrik Architectural Student of the Year* Award was Natal graduate **Elena Pascola** with her Design Thesis located in Durban's Point and entitled "Culture as a Tool for Urban Regeneration: An Urban Framework for a Multicultural Precinct." Judges for the national Award, which took place in Johannesburg in February, were Jean Stewart, Peter Malefane and Michael Hart. Elena, who had already won the KwaZulu-Natal regional *Corobrik Student Award* in November 1995, now has an additional R15 000 available for further studies!

In the photograph, Elena is flanked by Dame Jane Drew (left) and Errol Rutherford, *Corobrik* Executive Chairman (right).