

Craft and intellect: materiality in the domestic architecture of Gawie Fagan

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The domestic architecture of the seminal South African architect Gawie Fagan expresses a unique technological inventiveness formed by a deep appreciation of the technical and haptic properties and qualities of building materials. This appreciation was established through childhood exploits, a University of Cape Town engineering training, a pragmatic Pretoria University architectural education, years of architectural conservation practice, and hobbies such as sailing, flying and boat building. But the simplicity of Fagan's technological solutions belie their inner complexity, richness and effectiveness as they synthesize craft-based and grounded pragmatic intellectual approaches. This paper will outline these aspects as well as the inheritances of Fagan's approach to the use of materials, and will highlight how he synthesizes Cape vernacular influences with those of the late Modern Movement to achieve a unique, honest and economical material expression in his architecture.

Key words: Craft-based, pragmatic-intellectual, Cape vernacular, late Modern Movement

Handwerk en Intellek: materialiteit in die huishoudelike argitektuur van Gawie Fagan

Die huishoudelike argitektuur van die invloedryke Suid-Afrikaanse argitek Gawie Fagan openbaar 'n unieke tegnologiese vindingrykheid wat gevorm is deur 'n diep begrip van die tegniese en haptiese eienskappe en kenmerke van boumateriale. Hierdie begrip is gewortel in wedervaringe tydens sy kinderjare, sy opleiding in ingenieurswese by die Universiteit van Kaapstad, die pragmatiese argitektuur-onderrig aan die Universiteit van Pretoria, jare in die argitektoniese bewaringspraktyk, en in stokperdjies soos seil, vlieg en bootbou. Die eenvoud van Fagan se tegnologiese oplossings verskuil egter 'n innerlike kompleksiteit, rykdom en doeltreffendheid in die manier waarop hulle 'n sintese van 'n handwerk-gebaseerde benadering met 'n gefundeerde pragmaties-intellektuele benadering verteenwoordig. Hierdie artikel sal hierdie benaderings uiteensit, die nalatenskap van Fagan se benadering tot die gebruik van materiale definieer, en aantoon hoe hy inheemse Kaapse invloede met dié van die Laat-Moderne Beweging saamvoeg om 'n unieke, eerlike en ekonomiese materiaal-uitdrukking in sy argitektuur te volbring.

Sleutelwoorde: Handwerk-gebaseerd, pragmaties-intellektueel, Kaapse volksboustyl, laat Moderne Beweging

Architecture finds its expression in the use of structure and materials experienced through space and the effects of light. Uniqueness in material use and expression is initiated in the mind of the designer but is acutely enhanced by a hands-on approach to making extended through practical experience. These approaches are evidenced in the work of the South African architect Gabriel Theron (Gawie) Fagan (1925-) who has developed his own unique material expression by synthesising Cape vernacular inheritances with a late Modern Movement architectural education received at the University of Pretoria. The latter experience fostered a grounded intellectual approach which Fagan carefully balances with a haptic and craft-based design methodology developed in childhood and extended through conservation work as well as his own building projects¹. This paper will outline the distinction between, and inheritances of, craft-based and pragmatic intellectual design approaches and will locate these within Fagan's upbringing, education, conservation work and recreational pursuits. It will then describe how Fagan synergises the two design approaches to develop his own unique design strategies. But first the origins of craft-based and intellect design approaches will be sketched.

In the latter half of the 19th Century, architectural form shows a tension derived from the contrasting influences of mass production on the one hand, and the individuality of craft-based design on the other. “Charts replace apprenticeship” (Mitcham, 2005: 37) while “arguably, the evidence of the hand in preindustrial architecture [that] conveyed a sense of value, commitment, and importance in each detail of an architectural work” (Carlson-Reddig, 1997: 99) began to be lost.

Later, the universalist onslaught of the Modern Movement sounded the death knell of craft-based design in architecture but a few stalwarts such as Hans Scharoun (1893-1972) and Alvar Aalto (1898-1976) countered the trend by practising an alternative approach termed by Colin St. John Wilson (2007) as “the other tradition of modern architecture”. It echoed the work of Arts and Crafts architects such as Philip Webb (1831-1915) and William Morris (1834-1896) by “deriving inspiration for architecture from nature, suiting buildings to their sites, using local building traditions and natural (and local) materials” (Frampton, 1992: 42,43, Dunlop, 1999). “The aesthetic effect arose from...whitewashed volumes punctured by rows of windows and enhanced by the geometric play of chimneys and low-angled roofs” (Curtis, 1996: 88) echoing the Mediterranean leanings of the arch Modern Movement protagonist Le Corbusier (1887-1965) and, later, many of the New-Brutalists. Le Corbusier had identified the value the simplicity and authenticity of craft-based design noting (Frampton, 2001:133) that “the rusticity of the materials is in no way a hindrance to the expression of a clear plan and a modern aesthetic”.

These place-based influences tempered universal tendencies and, after the 2nd World War, regional modernisms developed in many non European countries including South Africa where a short-lived Modern Movement in the Transvaal was replaced in the 40s and 50s by a unique regional architecture. This was the educational world that Fagan was to enter in 1947. To understand this world, craft-based and intellectual design approaches must be defined.

Design approaches: craft and intellect

“Craft expertise requires three things: knowledge, skill and aptitude” (Hurcombe, 2007: 538). Knowledge of buildings traditions and local materials, new technological advances, culture, climate and place are essential ingredients for a craft-based design approach. Skill is developed through a physical, hands-on approach fused with a haptic sensibility that encompasses both the tangible and the mythical. Aptitude is the innate ability of the designer to understand the qualities of materials and the inherent possibilities.

Intellectual design, on the other hand, presupposes knowledge, the ability to think critically and creatively, distilling the essence of a problem and then being able to reconfigure that which exists into a new and improved condition.

Fagan has developed an extensive understanding of materials and has managed to synthesise craft-based and intellectual design approaches, particularly with technology and materials, through his inheritances, education and a 60 year career in architecture.

Fagan and craft-based design

Nature and nurture were instrumental in the development of Fagan’s innate aptitude for technology and he was fortunate to have an inventive father and a creative mother. Fagan’s technological skill was developed through an appreciation of the effects of context and a deep

sense of frugality. Fagan's father, Judge Henry Allan Fagan (1889-1963), developed a full-scale prototype for a farm gate pre-empting the development of the cattle grid. Fagan's son Henry (2009) recalls that his grandfather also designed an alternative to the qwerty keyboard for typewriters and developed his own shorthand system. Fagan's mother Jessie was an accomplished singer, actress and gardener who encouraged artistic pursuits with all her children (Fagan, 2008b).

I had a sketchbook, and my mother had a wall painted for us to draw on with chalk. I did not draw buildings on paper, but built a covered tree shelter where I could read undisturbed, and an earth covered shelter about which my mother was less charmed as it was dug in the middle of her rose garden (Fagan, 2010).

Although the Fagan children grew up after the Great Depression, they were still raised with a sense of frugality. Fagan's wife, Gwen (1924-), recalls (2008a) that no food would ever go to waste and that Fagan's father even refused to throw away old bananas.

Education: hand and mind- the experiential and the didactic

Fagan's final year high school grades demonstrates an affinity for languages and a lesser inclination for the sciences. Fagan acknowledges (2008a) that he made a limited effort academically – which is supported by the school records that Fagan should improve his learning work and shift his interests away from his hobbies. These pursuits played the largest role in the development of Fagan's aptitude for materials – these being contextualized through a love of sailing which allowed Fagan to appreciate both the static and dynamic aspects of context and their effect on human beings, and later, architecture.

Born in the shadow of Table Mountain ... some of my earliest recollections are literally of this wonderful earth – because I enjoyed nothing more than shaping the soil in our large garden, and modelling in mud, or by adding some branches, building little shelters. For me, these basic elements, earth and water, have always retained their mystery, and I pity the pink-eyed products of today's sophisticated computer games who are nevertheless deprived of the basic lessons and skills to be learned from creative handwork: for the child can only develop fully if hand and mind explore together (Fagan, 1983:1).

Hannes Fagan (2009) recalls that Fagan made kites as a child, often with water bags attached, that could be mischievously released on unsuspecting locals. These hands-on childhood experiences of materials were scientifically grounded during Fagan's tenure at the University of Cape Town where

the next few years were spent quite literally making music for my first sports car, and meeting the maidens; as these included my future wife. I have never had cause for regret but it did contribute to my dropping half way out² of the civil engineering course to study architecture, as my mother had always suggested I do (Fagan, 1983:2).

During his engineering course Fagan was more interested in pursuing his technological interests and bought about thirteen second-hand motorcycles that he repaired and sold on, finally purchasing, with the proceeds of his sales and music performances, an Adler, a German sports car. Fagan also made his own amplifier with the help of a friend, Dirk Elzinga and according to Hannes Fagan (2009) it was beautifully crafted in wood. Fagan and Hannes later took up flying lessons at the UCT flying club at Youngsfield. Fagan notes (2010) that

apart from boats, I was always fascinated by flying machines, inspired by Leonardo da Vinci. (I even wrote my notes in mirror-writing, which I can still do!) I built a glider, which refused to fly when

I jumped off a high wall with it. So when the opportunity arose through the UCT flying club, I was sure to grab it.

Fagan also started to take photographs from the air, a passion which fostered the publication *Brakdak: flatroofs in the Karoo* in 2008. Another contextual influence had been added to his already honed and intimate understanding of water and earth. A technological spin-off of the “flying” photography was Fagan’s construction of his own enlarger (Fagan J.J., 2009).

Fagan’s childhood and educational forays had reached maturity. A deep understanding of climatic elements and the earth were enhanced by a new (perhaps more scientific) set of tools that concretised his already developed sense of making.

Fagan and pragmatic intellectualism

In 1947, Fagan registered for architectural studies at the University of Pretoria. It was an important juncture in South Africa’s architectural history.

I was exempted from having to repeat these [engineering] subjects in my architecture course in Pretoria. I had also become a very good draughtsman, and probably have a better sense for engineering than most architect colleagues (Fagan, 2010).

The Modern Movement teachings of Rex Martienssen³ (1905-1942) and the Witwatersrand School of Architecture (Wits) had waned. Architecture returned to its root informants, to climate and the use of locally available materials and, in so doing, created an realistic and pragmatic response to the requirements of the time. But the Modern Movement canon was not ignored, indeed it expressed Le Corbusier’s retort (Frampton, 2001: 133) that “the rusticity of the materials is in no way a hindrance to the expression of a clear plan and a modern aesthetic”.

Tzonis (2007: 216) concurs that the architects of that time were focussed on “advancing efficiency of construction and enhancing comfort”. These new directions were called a ‘contemporary vernacular’ of the Transvaal (Fassler, 1956: 177), ‘Transvaal vernacular’ (Fassler, 1957: 22), ‘vernacular traditionalism’ (Cooke, 2003: 24) and a ‘Third Vernacular’ (Fisher, 1998: 123) while Duncan Howie⁴ (1945: 42) noted the development of a ‘contemporary indigenous architecture’. These contextual responses were not only a development of Johannesburg trends like Douglass Cowin’s⁵ (1911-?) Casa Bedo (Lipman, 1962: 14) but were influenced by the earlier work of architects like Gerhard Moerdijk⁶ (1890-1958) and artists like Jacobus Hendrik Pierneef⁷ (1886-1957) who argued for a “true” house in which the Transvaal climate and environment were accounted for and advocating the use of simple materials that might be readily available on a farm, such as thatching grass rather than imported corrugated iron (Fagan, 1991a: 5). Interestingly,

local materials weren’t subject to the Building Control of the time and were freely available. Woodblock was restricted to only a few square metres per house, for example, so slasto or brick became the flooring of choice (Nation, 2003: 2).

These influences, amongst others, propelled ‘regionalist’ architects like Norman Eaton⁸ (1902-1966) to reconcile the dichotomies of industry and art through the inventive use of elements such as brick and tile (see Fig.1). Eaton’s woven walls and patterned woodblock floors are demonstrative of a craftsman using standardized materials at hand to see his way out of the “inconsistency, incoherence, disharmony, and general chaotic ugliness of architecture” (Harrop-Allin, 1975: 26).



Figure 1

Left: The ceramic screen of Eaton's Netherlands bank in Durban 1961-5 (Author, 2004). Right: Eaton's woven brick wall at the Little Theatre in Pretoria (c.1950) (Harrop-Allin, 1975: 97).

The International Style ignored its materials of brick, concrete and steel, refusing to express these in the search for pure form. The reaction to this was not merely a more honest expression of materials present but a conglomerate of different materials vying (sic) for effect. Unplastered brickwork; timber on floors, walls and ceilings externally and internally; stonework as walling or as covering on floors and verandahs, were ever present (Anon, 1965:7).

The effects of the Second World War and economic limitations resulted in shortages of materials which required architects to become inventive. Structural elements were minimized through the use of simple forms with short spans. Peters (1998: 187) recalls that Helmut Stauch⁹ was adept at building a lot with a little and this attitude must have influenced Fagan through Stauch's teachings at the University of Pretoria. Similarly Basil South¹⁰ (1925-1952) encouraged the expression of materials in their original state and that junctions should be simply but clearly articulated. Local material production also influenced architectural approaches. In 1936, Iscor (Anon, 1965: 38)¹¹ began producing steel roofing sheets and standardized steel windows on a 3'4" module. These were to become part of the Pretoria regional aesthetic and structural logic through the work of architects like Stauch (Peters, 1998: 185) and Robert Cole Bowen¹² (1915-1952) (Fisher et al, 1998: 132).

Cole Bowen, within the limited budgets of his clients, used the standard steel windows as a module for his rafters, and this simplicity, combined with space-saving and an honest use of materials, produced some very interesting houses (Teeger, 1965:7).

Steel roof sheeting was economically and climatically advantageous as it allowed for lower roof slopes, larger overhangs and limited roof structure. The architectural responses of the time avoided a sentimental approach to tradition and a pragmatic-intellectual approach developed a 3rd Modern Movement (Barker, 2012: 84) which synthesised canonical (but placed-based) Modern Movement spatial and functional tenets with an emphasis on the use of local materials and climatically suitable building forms.

Craft-based design and local architecture

Fagan can be regarded as South Africa's foremost conservation architect, having worked on buildings such as the Cape Town Castle, Tulbagh main street and the Boschendal wine estate. It can be argued that by working on old buildings in the Dutch influenced Cape context has played a significant role in his appreciation of traditional building technologies and materials. Fagan also understands the value of tradition as a dynamic process, highlighting a critical understanding of the past.

Vernacular architecture all developed organically and over a period of time, prescribed by available materials, climate, and way of living of the builders ... This developed into tradition, people building unquestionably as their fathers before them, making only small individual adaptations (Fagan, 1969:1).

In a lecture, “Learning from the Vernacular”, given in 1996, Fagan lists ten important lessons to be learnt from our built heritage, all founded on a premise of dignity and fitness for purpose. Three overriding qualities frame Fagan’s approach to the use of tradition in architecture. These are a respect for place, technology as craft, and the use of symbols. Five principles relate directly to the use of materials.

The first is “Simplicity and economy of means” explained by Schlapobersky (1965: 32) as

Simplicity ... is the essential part of order in life. The discipline and restraint used in the old buildings of the Cape is only rarely to be found in buildings today. It is difficult but necessary to find that simplicity and a new serenity expressed in new.

Fagan understands the value of Cape building traditions as a common sense building approach. Climatic and functional problems had to be solved and builders used what they had at hand. This fostered an inventive approach.

The builder would also economize by using materials at hand such as reeds for the ceilings and dung for the floors. often showing wonderful inventiveness such as using peach pips for a hard yet decorative floor. I am not suggesting for one moment a return to an arts and crafts approach, but do know that I have been able to bring a lot of ideas to bear on my designs possibly by my engineering training, working with materials like designing and moulding this fairing for my favourite mount, or even just extensively rebuilding my yacht (Fagan, 1985: 7).

Fagan highlights the importance of construction in the second principle, “Structural integrity and honesty”:

Most vernacular building makes sound common sense, and what I would like to describe as the inherent structural integrity of our Cape Dutch tradition is well explained in this sketch by Barrie Biermann [see Fig. 2]. The heavy walls following Portuguese practice rather than that of the fatherland, are built in a T or U or other configuration allowing a room width not exceeding some 6 metres to accommodate the generally available ceiling joists [see Fig. 2] that would allow the characteristic and ingenious brandsolder to separate the contents of the house from the highly flammable thatch covering on rafters and rough hewn pegged principal trusses. To my mind, its beauty resides also in its lucid but unforced expression of its structure, and I am sure that this is a quality one could well aim to achieve (Fagan, 1983: 6,7).



Figure 2

Left: Biermann’s sketch (to which Fagan often refers) showing the spatial and constructional layout of the traditional Cape house (Biermann, 1995: 37). Right: Timber tie beams of roof truss supporting floor of roof space in vernacular building (Fagan, 2012).

The third principle, “Plasticity or modelling” is aesthetically important for Fagan as it creates a direct and visual link to history.

Probably the most beautiful and certainly the most unifying characteristic of our Cape Dutch architecture is the plastic quality of the softly plastered lime washed walls (Fagan, 1983: 6).

“Appropriate and consistent detailing” is the fourth principle and emphasises the fit of detail to context:

So for instance, although the same basic type of pintle and strap hinge serves for the humblest cottage or finest house such as ...at Boschendal, the size and execution is always cannily suited to the occasion (Fagan, 1983: 7)

The last principle relates to “Colour”. Fagan (1985: 11) describes the inheritance of colours in Cape buildings as a result of the Dutch being of sea-faring stock and that their boats were painted with greens, blues and reds such as on Mostert’s Mill¹³ in Mowbray, Cape Town. He notes that walls of houses on the Parade in Cape Town were also painted in different hues to reduce glare but windows remained the standard green. This colour symbolised the mysticism of life and also expressed holiness to the followers of Islam. Contrastingly the blue represented the feminine principle of water.

Architectural expression: the synthesis of craft-based design and pragmatic-intellect design approaches

Fagan’s search for the authentic is closely tied to the development of a new modern-day vernacular. Fagan believes, as Curtis (1996: 87) does, that “authentic architecture [can be achieved through] values of simplicity and directness”. To achieve this, Fagan has unconsciously developed a number of design methodologies that synthesise craft-based and pragmatic-intellectual approaches. These are effected by unique approaches to the use of technology and materials.

Fagan uses his extensive knowledge of materials together with his natural aptitude, hands-on approach (particularly in his own house, Die Es - see Fig 3)¹⁴ and learned pragmatic-intellectual approaches to create new technologies, He notes (1972: 2) that

we must use technology to produce our own vernacular - an architecture where man who lives in the house is part of the design process. This will be an architecture of our technology and our varying ways of living – not an international architecture

and that the

primary responsibility of the architect is not to satisfy his sculptural instincts. The primary responsibility of the architect is to design an effective living environment – that is, a building that works, that uses materials well, that uses energy effectively (Fagan, 1991b: 15)



Figure 3

Left: Fagan in his workshop at Die Es c.1965 (Fagan archive, undated). Right: Fagan’s family busy with the construction of Die Es (Fagan, 2012).

The rational and the corporeal

Fagan interprets vernacular architectural principles intellectually (through distilling the essence of design and construction approaches) and balances these with corporeal design strategies focussed on spatial experience. In Die Es, in Camps Bay Cape Town, the spatial qualities of the Corbusian architectural promenade are accentuated through the use of different floor materials. These occur at various points along the route and at the end of the hallway there is a change in sound from the stone tiles to the clay of the living space, mediated by a suspended steel-framed timber platform (see Fig. 3). A similar approach is used in Fagan's late parents' house Keurbos (1951).



Figure 4

Left: Steel framed timber platform at the junction of living and entrance hall at Die Es (1965) (Fagan, 2012). Right: Similar platform at junction between passage and main bedroom at House Keurbos (1951) (Author, 2008).

Familiarity and strangeness: old and new

Fagan contrasts traditional and Modern Movement architectural forms, the former fostering a connection with craft-based design and the latter expressing a pragmatic-intellectual design approach. Fagan contrasts traditional building techniques, particularly the stereotomic¹⁵ approach to the making of walls, with new roof and window/door technologies resulting in a tension between rough enclosure and smooth tectonic plane. Walls are most often treated as simple brick elements with little articulation save for a 'plastic' finish.

Tog is sy eie ontwerpe allermens tradisioneel in die sin dat hulle behoudend voorkom. In hulle word nuwerwetse ruimtespel met ouderwetse vakkundigheid so onopsigtelik bekleed dat die toekoms geredelik in die historiese kontinuïteit betrek word (Biermann, 1975: 1).

[His own designs are least of all traditional in the sense that they read as conservative. In them new spatial play is so unobtrusively cloaked with old fashioned skill that the future is promptly entangled in historic continuity]

Openings are new inventions. The shutters of old become louvers or sliding screens that hover over glazed openings. A contrasting Cape ambience is created by the use of roughly plastered white-painted walls, quarry tile floors and timber roofs. Hand-made clay floor tiles connect directly with their vernacular precedent while ceiling voids are directly connected to internal spaces and traditional roof trusses are replaced with tongue and grooved timber ceiling boards over exposed timber rafters. The most expressive and inventive use of timber is in Die Es where a syncopated timber structure rises and falls over a central beam (see Fig. 5).



Figure 5

Left: The roof of Die Es under construction c.1965 (Fagan, 2012). Right: Layered construction of Die Es roof (Fagan, 2012).

Simplicity and economy of means¹⁶

There is a close synergy between vernacular and craft-based design approaches to technology and Fagan’s own methods. Structural elements are minimised through the use of short spans. All materials (except walls) are expressed in their original state and junctions are simply but clearly articulated. In Die Es he purposefully expresses the unplastered and unpainted in situ first concrete floor slab in the white facade (see Fig. 8). This lack of continuity in wall treatment seems incongruent but is in stark contrast to Le Corbusier’s treatment of Villa Savoye, where disparate technologies are masked by a plaster layer. Fagan does however rely on the heterogeneity of traditional wall construction, where clay bricks are either plastered or bag-washed and painted to achieve a plastic continuity (see Fig. 8).

Fagan also achieves a pragmatic-intellectual design approach to an economy of means by using elements to perform more than one function. The foyer to his parents’ house in Newlands not only merges internal and external conditions (see Fig. 6) through a glazed roof but provides adequate solar gain onto a tiled concrete floor. This acts as a heat sink in both summer and winter. The steel roof collars in his houses in Betty’s Bay (1998) and Hermanus (1990) act as roof and flue supports (see Fig. 6) while chimneys often act as focii in pin-wheel plan arrangements.



Figure 6

Left: Foyer and dining area of House Keurbos (1951) flooded with light from glazed roof over (Author, 2008). Middle and right: Steel roof collars to House Beyers (1998) and House Swanepoel in Hermanus (1990) act as roof and flue supports (Author, 2009).

The simple use of colour in vernacular architecture is best illustrated by the bright whites of Mediterranean architecture set against the blue hues of its window shutters. Fagan’s hero Le Corbusier was largely influenced by the simplicity of this architecture and as Passanti (1997: 438) remarks “in Romania and Tirnovo [Le Corbusier] was struck by the bright color scheme of the houses, repainted twice a year in brilliant white with accents of sharp blue”. Fagan uses

these and local vernacular approaches to colour on shutters in his “holiday house design, which change from predominantly green when shuttered, to blue when opened up” (Fagan, 1985:11) (See Fig. 7). At Paradys in Langebaan a red hue dominates the rear wall (see Fig. 7) of the roadside facing and partly submerged courtyard where Fagan expresses a connection with earth. Fagan also notes (1973: 5) that he has used colour to express different functions or elements such as House Beyers in Betty’s Bay (2008) where non structural infill walls are painted a muted sea green.



Figure 7

Left: Courtyard to House Paradys (2003) (Author, 2009). Middle: Green and blue hues to doors at House Swanepoel in Cape St. Francis (1980) (Photo courtesy of Pierre Swanepoel architect, 2012). Right: Green and brown hues to House Beyers (1998) (Author, 2009).

Authenticity

Fagan uses materials in their purest form as they

are inherent qualities if your materials are won by the sweat of your brow from the barren Tanqua Karoo, or hacked from the very limestone on which your walls will rise (Fagan, 1996: 5).

In-situ reinforced concrete is left as is, sans plaster or paint, even when it could possibly compromise the integrity of the overall form such as at Die Es and House Bertie-Roberts (1965) (see Fig. 8) where the first floor slab is exposed on all edges. Brickwork is bagged and painted (see Fig. 8), an aesthetic tendency Fagan must have inherited from mentors such as Stauch and Eaton who employed similar approaches, but also influenced by the rough textured nature of the Cape vernacular. Roof timbers are varnished (see Fig. 9) but doors are often painted to give symbolic expression to their interior and exterior nature (see Fig. 7).



Figure 8

Left: Bagged and painted brickwork to House Swanepoel in Cape St. Francis (1980) (Author, 2005). Second from left: Authentic expression of different materials at Die Es (1965) (Author, 2008). Second from right: House Paradys in Langebaan (2003) showing brick vaults (Author, 2009). Right: Cantilevering supports to House Bertie-Roberts (1965) (Fagan archive - Job No. 644, undated).

Fagan clearly distinguishes between stereotomic and tectonic elements. Where both are used they are separated by glazing, such as in the floor to ceiling panels in House Keurbos and the

clerestories under the syncopated roof at Die Es. Where a consistent constructional methodology is employed the elements merge. This can be seen in the stereometry of the barrel vaulted examples such as Houses Lückhoff in Onrusrivier (1981) and Paradys in Langebaan (2003) (see Fig. 8).

Economy

Le Corbusier believed that effective and functional design would naturally give rise to beauty. Fagan has developed economical design approaches to both space and the use of materials in line with Modern Movement intentions and vernacular approaches where limited materials were at hand and inventive approaches had to be sought. Fagan's knowledge of boat building and the compromises that need to be reached between weight and durability versus speed has played a significant role in his material choices. He often employs the flitch beam (a combination of timber and steel plate) to form rafters where larger spans would make the size of timber uneconomical and bulky, the latest example occurring at House Mitchell (2005) (see Fig. 9). Fagan also limits building depth as in vernacular buildings, where limited timber lengths determined spans or he employs cross beams to limit the size and length of rafters.



Figure 9

Left: House Mitchell (2005): Flitch beams in living area (Author, 2009). Middle: House Keurbos (1951): beams used to reduce span and define spaces (Photo courtesy of Leon Krige Architect, 2010). Right: Column supports for thatch roof at House Swanepoel in Cape St. Francis (1980) (Fagan archive - Job No. 8011, slide collection IC, undated).

Environmental

Fagan uses the thermal mass of materials like clay brick walls and reinforced concrete floors to achieve comfortable indoor conditions. He has translated the stereotomic vernacular tradition of brick-vaults in his farmworker's houses in Idas Valley (1975), Houses Lückhoff (1981), Paradys (2003) (see Fig. 8), the unbuilt Van Zyl in Swellendam (2007) and a proposal for House Visser (2011). Here Fagan has added brick vaulted roofs to increase thermal mass. But these interpretations are probably also, in part, related to the influence of Le Corbusier's translation of the Mediterranean vernacular in his 1935 weekend houses in Paris and Petite Maison de Weekend (Villa Fèlix, 1935) at La Celle-Saint-Cloud. In most of his other houses clay or brick-tiled floors and suspended concrete floors (such as the 400mm thick floor in Die Es) provide heat sinks in the summer months.

Detailing

Fagan follows a common sense approach of the builders of old explaining (2008a) that his office does not build up a set of standard details, but that earlier work is referred to and adjustments are continuously made to develop appropriate details. Fagan relies on his boat and plane building experiences to create pragmatic but sensitive ways to join and secure materials. Fagan's approach alternates between the simplicity of the continuous reinforcing rod handrail at Die Es to the sophisticated hand-operated louvered sunscreen and front door at Keurbos (1951) (see Fig. 12). The door handles to Die Es are not only 'rationally' designed according to the Hambidge proportional system¹⁷ but also haptically suited to the action of the hand. In true Fagan spirit, he made them himself (see Fig. 10). Column and beam connections and purpose made light fittings are all simply but appropriately detailed for their context.



Figure 10

Top Left: House Keurbos (1951): column support for main roof over dining and living areas (Author, 2008). Top Middle: Front door to House Keurbos designed by Fagan in 1951 and only constructed in 2009 (Author, 2009). Top Right: Column and beam junction in House Keurbos (Author, 2008). Bottom Left: Continuous steel rod handrail at Die Es (Fagan, 2012). Bottom Middle: Glass Japanese fishing float reused as light fitting at Die Es (Fagan slide archive, undated). Bottom Right: Front door at Die Es made from old copper boilers (Fagan, 2012).

Fagan follows the tradition of his Pretoria lecturers in his design of brick screen walls to Die Es and Keurbos (see Fig. 11) while the shutters of old are reinvented to suit their orientation and context and mystical connection. Their formal nature is Modern Movement inspired through their separation from window and wall plane and sliding or rotating fixings.

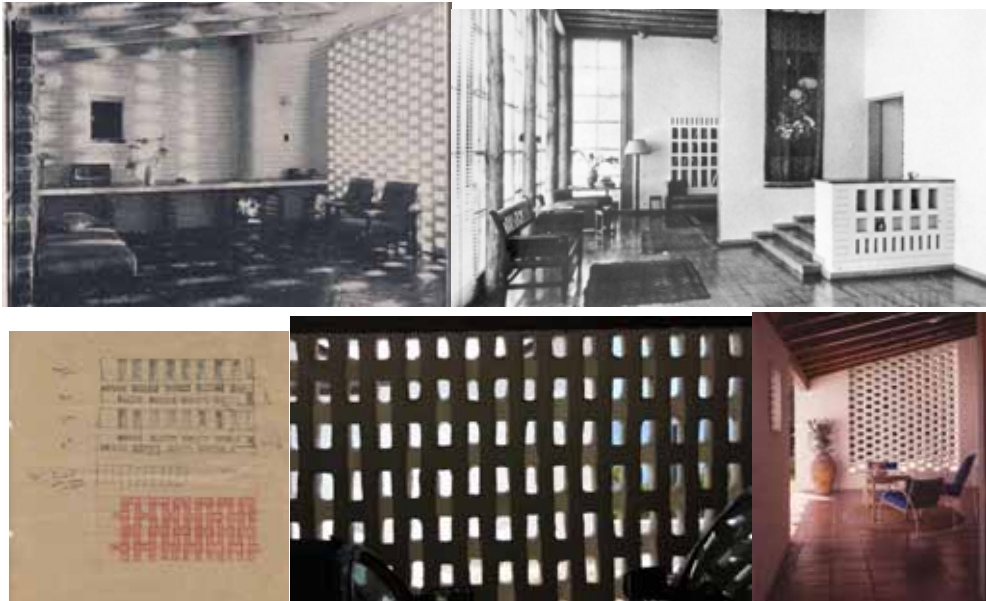


Figure 11

Top left: Honeycomb wall between living and dining rooms in House Collins (1951) by Cole Bowen (Cole Bowen, 1953: 49). Top right: Brickwork wall niches in living room and study of Eaton's Anderson house (1949-1950) (Harrop-Allin, 1975: 80). Bottom left: Fagan's sketches of screen wall to Die Es (1965) (Fagan archive job. no. 656, undated). Bottom middle: Rear wall of carport to Die Es (Author, 2012). Bottom right: Keurbos original patio wall (Fagan, 2012).



Figure 12

Top left: Shutter to Non Pareille homestead, Paarl (1876) (Author, 2007). Top middle and right: Shutter opening mechanism and shutter to House Keurbos (1951) (Author, 2008). Bottom left: Shutter to main bedroom at Die Es (1965) (Author, 2008). Bottom middle: Sliding shutter to House Fagan in McGregor (Author, 2009). Bottom right: Hinged and ventilated shutter to House Paradys (2003) (Author, 2009).

Conclusion

The materiality of Fagan's domestic architecture is influenced by physical place and long-standing Cape vernacular tradition which is understood, appreciated and reconfigured to suit the requirements of modern living.

Fagan's search for the authentic in architecture has allowed him to synthesise craft-based and pragmatic-intellectual design approaches, the antecedents of which were established in his childhood, education and architectural conservation practice. Craft-based design was informed by an appreciation of tradition, through appropriate climatic responses and the use of locally available materials. Pragmatic-intellectual approaches were developed through the formal and functional canon of Le Corbusier, the lessons of economy and simplicity learned from the Pretoria school and the experiences of the work of architects such as Helmut Stauch and Norman Eaton.

The availability of new materials and Fagan's natural aptitude for making fosters an inventive technological approach resulting in honesty in expression, fitness for purpose and economy of use. This has created a unique material architectural expression that hovers between tradition and invention.

Notes

- 1 Include buildings as well as planes, boats, and motorcycles.
- 2 Fagan, in fact, remained in the course for 4 years, from 1943 to 1946.
- 3 Martienssen, Rex Distin (1905-1942) graduated at the University of the Witwatersrand, eventually becoming an influential lecturer. He visited and communicated with Le Corbusier and attempted to pioneer a Modern Movement architectural direction in South Africa with various publications, including *zero hour* (sic) in 1933 (Herbert, 1975).
- 4 HOWIE, W. Duncan. Started studies in 1930 at Wits, worked for Hanson, Tomkin & Finkelstein in 1934 and graduated in March 1936 with the Degree of Bachelor of Architecture – with distinction. He taught part-time at the Pretoria School of Architecture. and rose to the rank of full Professor at Witwatersrand University School of Architecture after the retirement of John FASSLER . Retrieved on 11 April 2012 from <http://www.artefacts.co.za/main/Buildings/archframes.php?archid=2039&countadd=1>.
- 5 Cowin's winning design for the 1934 Ideal Home competition is starkly imitative of Le Corbusier's work. In only three years he had completely revised his position.
- 6 Moerdijk, Gerard Leendert (1890-1958) worked at the Department of Public Works (DOW) and in 1909 left to study architecture at the A.A. After returning to the DOW in 1917 he formed his own practice which moved from Johannesburg to Pretoria in 1924. He established a new direction in South African church architecture. He was a staunch supporter of the culture of the Afrikaner and was best known for his design of the 1938 Voortrekker Monument (my translation from Fisher & Le Roux, 1989: 123).
- 7 Pierneef, Jacobus Hendrik (1886-1957) was the son of a builder from the Netherlands. He matriculated in Pretoria but returned with his family to the Netherlands to attend drawing classes and study at the Academy for Fine Arts in Rotterdam but due to financial restraints could not complete his studies. He returned to South Africa and continued with drawing studies under Gordon Leith. A great influence on his paintings was the Namibian landscape and indigenous culture of the Bushmen (Fisher & Le Roux, 1989: 125).
- 8 Eaton, Norman Musgrave (1902-1966) was born in Durbanville in the Cape, trained at the University of the Witwatersrand, apprenticed with Gordon Leith and caught the eye of Herbert Baker who nominated him for membership of the Royal Institute of British Architects (RIBA). Eaton displayed a sensitivity for context and the materiality and detailing of African architecture, while the Cape vernacular greatly influenced his work. Retrieved on 19 July 2008 from <http://www.artefacts.co.za/main/Buildings/archframes>.

- php?archid=450&countadd=1 and Harrop-Allin, 1975.
- 9 Stauch, Hellmut Wilhelm Ernst (1910-1970) was born in Eisenach, Germany, emigrating to Southern Africa in 1935. Stauch worked almost exclusively in and around Pretoria, experimenting with industrialised building components to bring South African building methods more into line with the twentieth century in Europe. In 1943 Stauch joined the staff of the School of Architecture at the University of Pretoria as a lecturer in design teaching there for eight years. Retrieved on 11 April 2012 from <http://www.artefacts.co.za/main/Buildings/archframes.php?archid=1614&countadd=1>.
 - 10 South, Basil Hugh (1925-1952) was born in Mafikeng, was trained at the Wits School of Architecture and taught at the University of Pretoria during Fagan's studies (Steenkamp, 2003: 5). He was well respected as a teacher but unfortunately died at a young age of tick-bite fever. Fagan later bought his farm at Kameeldrift in Pretoria.
 - 11 Fisher et al (1998: 131) note 7 May 1937.
 - 12 Cole-Bowen, Robert Edward (Coley) (1915-1952) was born in Winburg in the then Orange River Colony. He started his architectural studies at the Department of Architecture at the University of the Witwatersrand in 1923, but due to family commitments left and later attended part-time classes in Pretoria, registering as an architect in 1928. He ran a private practice from 1945 to 1953 and was also an influential senior lecturer at the University of Pretoria when Fagan studied there. Retrieved on 19 July 2008 from <http://www.artefacts.co.za/main/Buildings/archframes.php?archid=157&countadd=1>.
 - 13 Mostert's Mill is a small farm windmill built around 1796 in Mowbray, Cape Town.
 - 14 Fagan and his wife, mother and children constructed this house over a period of about five years.
 - 15 Stereotomic architecture refers to heavy construction such as brick and stone and is often contrasted with a framed, teconic, architecture of steel or timber (Frampton, 1995: 5)
 - 16 In an April 2012 lecture, at the Cape Peninsula University of Technology, Fagan noted that 'Simplicity' is, for him, the most important vernacular influence.
 - 17 Jay Hambidge's 1932 book titled *Dynamic Symmetry* described a system of proportions based on the Fibonacci series. It was extensively used during Fagan's tenure at the University of Pretoria.

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