Evolution of the boundary: Theories of threshold, *poché* and stereotomic design, and their manifestation in the work of Henri Comrie

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The design of boundaries in architecture has a rich history that provides intellectual nourishment for a reconsideration of the relationships between city and nature, city street and building and the transitions within buildings. This article will describe the condition of boundary in place-making and architecture by sketching a brief theoretical and philosophical background of approaches to its formation. Following this, the formal expression and articulation of boundaries in urban and architectural settings will be outlined. Then, through the description of selected examples of the urban and architecture outputs of the award-winning South African architect and urban designer, Henri Comrie, real-world examples of boundaries will be contextualised and described.
Key words: Boundary, dynamic space, light, *poché*, stereotomic forms

Evolusie van die grens: Teorieë van drempel-, *poché*- en stereotomiese ontwerp, en hul manifestasie in die werk van Henri Comrie
Die ontwerp van grense in argitektuur het ‘n ryk geskiedenis wat intellektuele versterking bied vir ‘n heroorweging van die verhoudings tussen stad en natuur, stadstraat en gebou en die oorgange binne geboue. Hierdie artikel sal die toestand van grens in plekskepping en argitektuur beskryf deur ‘n kort teoretiese en filosofiese agtergrond van benaderings tot die formasie daarvan te skets. Hierna sal die formele uitdrukking en artikulasie van grense in stedelike en argitektoniese omgewings uiteengesit word. Dan, deur die beskrywing van geselekteerde voorbeelde van die stedelike en argitektuuruitsette van die bekroonde Suid-Afrikaanse argitek en stedelike ontwerper Henri Comrie, sal werklike voorbeelde van grense gekontekstualiseer en beskryf word.
Sleutelwoorde: Grens, dinamiese ruimte, lig, *poché*, stereotomiese vorms

The theme of the June 2019 London Festival of Architecture was “Boundaries”. Through a range of events and exhibitions, the concept and physical expression of boundary was investigated at socio-cultural and urban-architectural levels to elicit its intangible and tangible possibilities. It is the latter attribute that is particularly important for architects and urban designers as they consider the form of internal and external spatial connections. Our everyday spatial experiences are consciously, and unconsciously, guided by transitions through boundary conditions that occur at a range of scales, such as those between city and nature, building and street, and the interior and exterior of buildings. These transitions, all defined in their own unique ways, are often imbued with metaphorical and physical meaning, as spatial realms that range from the sacred to the profane are negotiated. The design of the boundary condition has a long history that has been richly developed over time, providing a fertile field for theoretical consideration and further design exploration.

This article will describe the condition of boundary in place-making and architecture by sketching a brief historical, theoretical and philosophical background of approaches to its formation. Following this, the formal and spatial expression and articulation of boundaries in urban and architectural settings will be outlined. Then, through the description of selected

examples of the urban and architectural outputs of the award-winning South African architect and urban designer Henri Comrie[1] the value of, and application in, real-world examples of boundaries will be contextualised and described.

Background

It was Georg Simmel (1858-1918), a German sociologist and philosopher, who once used an analogy of the bridge and the door, to metaphorically describe the extremes of the relationships of social existence. At the heart of Simmel's argument (Simmel in Leach 2002: 66-7) was that social contradictions could be resolved through the use of a "path" or more directly through a "bridge", while the inclusion of a "door" created a dialectical condition through its concomitant rejection and acceptance of possible connections. Simmel argued that "the bridge and the door are concrete manifestations of fundamental human tendencies to separate everything. The bridge indicates that humankind unifies the separatedness of merely natural being, and the door how it separates the uniform, continuous unity of natural being" (Simmel in Leach 2002: 65).

Through time, and changing historical milieus, a number of philosophers, historians and architects have postulated on the concept of boundary and its interior and exterior dialectics through a focus on social aspects, urban definitions, historical responses and architectural-spatial expression.

The German philosopher, Walter Benjamin (1892-1940), a Simmel acolyte, was a cultural critic who pontificated on aspects such as urban modernity (Leach 2002: 24) and aesthetic theory. His contribution to the critique of the modern city, and its various boundary conditions or thresholds, was to highlight the exploits of the *flâneur* (Tally 2013: 95), a literary figure referred to by Charles Baudelaire (1821-1867) "which [Benjamin] repeatedly likens to the immigrant or exile – as the representation of a particular kind of gaze, disclosing the arquitectonics [sic] and structure of capitalist bourgeois society" (Enquist Källgren 2020: 403). At a spatial level, it was suggested that the *flâneur* purposefully negotiates the city's spaces highlighting the importance of urban space and dynamic movement. But Benjamin's understanding of the city also highlighted the notion of porosity, or blurred boundaries, when describing the "absence of spatial boundaries and divisions between phenomena, one thing meeting another … interior and exterior" (Porter 2004: 145).

Martin Heidegger (1889-1976), another German philosopher, also critiqued the Modern Movement city mainly through the privileging of technology in its formation (Leach 2002: 98). His critique, through the question of "being", was largely metaphysical in nature but in

[1] Henri Comrie (1965 -) undertook his architectural education at the Department of Architecture at the University of Pretoria (UP) and obtained his BArch degree in 1991. He then went on to complete a Masters degree in Urban Design at the University of the Witwatersrand in 1995, and a PhD (also in Urban Design) at the Joint Centre for Urban Design at Oxford Brookes and at the University of Greenwich in 2003. He began teaching at the University of Pretoria in 1996, and from 2012 until 2016 he was an Associate Professor and chair of the Master of City Planning and Urban Design programme at the University of Cape Town (Comrie 2019: 21). The attention of this article is on Comrie's attitude to the making of form as the authors believe that it is uniquely formed in its South African context. The authors do not believe that other design considerations present in the architect's work are less important, but these cannot be addressed in the limited space available.

his seminal piece *Building, Dwelling, Thinking* (1954; Leach 2002: 100) Simmel's analogy of "bridge" is extended to encompass both the intangible, through socio-cultural meaning and the tangible, through the physical artefact.

Henri Lefebvre (1901-1991), a French Marxist philosopher and sociologist, whose main focus lay in a critique and understanding of everyday life, highlighted the contradictions of inclusion and exclusion in spatial practice and in practical space (Lefebvre 1992: 294). Amongst other aspects, Lefebvre described the separation between city and nature through his anthropologically founded distinction between familiar village and its foreign or strange surroundings.

At a more tangible and architectural level, the Postmodern theorist (and late practising architect) Robert Venturi's (1925-2018) seminal work *Complexity and Contradiction in Architecture* focused on a critique of the Modern Movement and its catchphrase of "less is more". One of the many possibilities of dealing with the "puritanical moral language of orthodox Modern architecture" (Venturi 1977: 16) through contradiction, was the establishment of possible relationships between the dialectics of inside and outside (Venturi 1977: 70). Venturi cited a number of alternatives, to achieve new relationships, from the Wrightian (1867-1959) and Baroque (seventeenth century) continuity of surface to Eero Saarinen's (1910-1961) ideas of a room as a space within a space.

Venturi further argued that architecture occurs at the junction of interior and exterior space, becoming a "spatial record of this resolution" (Venturi 1977: 86). Importantly, the threshold that houses this resolution provides a "dialectic of division" (Bachelard 1994: 211) and a transition space that operates in two directions, expressing a boundary condition.

Boundary

The boundary represents the difference between two distinct conditions, reinforced by Heidegger's assertion that it "is not that at which something stops but, as the Greeks recognized, … that from which something begins its presencing" (Norberg Schulz 1983: 66).

Physically, early settlement enclosure was epitomised by the surrounding defensive wall, marking a territorial boundary. Later in urban settings, the boundary defined and provided the place for architecture to exist (Norberg Schulz 1983: 66). Here, boundaries were crossed by the path or street, facilitating movement (or dynamic space), connection and an acceptance of change. To satisfy utilitarian necessity, physical boundaries can be traversed by devices such as bridges, streets and squares.

At a building scale, the boundary is represented as a threshold, mediating internal and external conditions, not only physically but with inherent meaning: "In his analysis of Trakl's *A Winter Evening*, Heidegger shows how the threshold carries the unity and difference of world and thing (earth). In a building the threshold separates and simultaneously unites an outside and an inside, that is, what is alien and what is habitual" (Norberg Schulz 1983: 66).

The architectural boundary
The *poché*

It can be argued that there are two dialectic ways of forming architecture. One is additive, and the other, subtractive. Kenneth Moffett (1994: 242) adds that, although either approach usually takes precedence, architecture contains a synthesis of the two. Subtractive form making is achieved through the metaphorical carving of solid form, recalling the natural forms of caves or burrows in the ground. Lewcock (2006: 202-3) explains the formal analogy of the cave as a generative concept, aligned with Carl Jung's (1875-1961) definition of it as an archetype closely associated with the human's primal condition of understanding space.

The creation of subtractive space is best associated with stereotomic form. Kenneth Frampton (1995), Cornelis van der Ven (1977: 78) and others have defined stereotomic structure, in a structurally rationalist sense, as the piling up of heavy elements formed through the Greek definition of the cutting of stone.[2] Gottfried Semper (1989: 177) regards it as the "true *monumental* technique" and according to Frampton, he divided built form "Into the tectonics of the frame, in which members of varying lengths are conjoined to encompass a spatial field; and the stereotomics of compressive mass that, while it may embody space, is constructed through the piling up of identical units" (Frampton 1990: 24; 2002: 95).

The results of subtractive design provide an interstitial formal condition that mediates inside and outside and, as Eisenmann (2007) has described, also between interior spaces. González and D'Acunto (2016: 178) assert that "subtractive design methods in architecture and the stereotomic approach in particular, result in the generation of a *poché* [meaning pocket in French], both in its meaning of rendering technique and a compositional device. *Poché* was a term introduced by the École des Beaux-Arts of Paris to define the hatched texture used to differentiate the massive elements and the residual spaces drawn in architectural plans". The *poché* is a formal device often used to provide structural support such as in Roman architecture and mediaeval castle walls, as well as being a device to resolve spatial connections of various geometries, such as that in San Carlo alle Quattro Fontane (1646) in Rome, by Francesco Borromini (1599-1667). In the latter condition, the wall is a result of "a process defined as spacing rather than a forming … The interstitial, then, is the result of a process of extraction which produces a figural as opposed to a formal trope, and it exists as a condition of spacing as opposed to forming" (González and D'Acunto 2016: 178) and represents an occupiable space that is excavated *within* mass" (Simitch and Warke 2014: 69).

Further definitions of the *poché* in the 1970s were developed by Bill Hillier (1937-2019) and Adrian Leaman (1946-), as part of their investigations into space syntax. They postulated that the creation of space through form could be described as twelve combinations of solid and space related through continuity, discontinuity, containment and permeability (Lewcock 2006: 201) which, in turn, could be combined in eight different ways.

González and D'Acunto (2016) note that the *poché* has been used to great effect in the theories of "modern" architects such as Robert Venturi, Colin Rowe (1920-1999) and Rem Koolhaas (1944-) in the early 1990s, who applied Venturi's principles to represent the idea of spatial voids hollowed out from a solid. Meisenheimer (2011: 629) argues that these interstitial

[2] From the Greek *stereos* (solid) and *tomia* (cut).

elements, or residual spaces (Venturi 1977: 82), are not only structural or formal but also psychological, as they provide another layer of inhabitable protected space.

The formation of the *poché* or residual space provides the possibility of separately expressing internal and external conditions while providing a "thickening" of threshold to facilitate more expressive and phenomenological possibilities of transition. But the boundary condition implied through the *poché* can be managed in a number of ways including those that imply continuity (a bridge or threshold), interruption (the door), or connection (the window).

The threshold

The threshold can be defined as a transitional zone between internal and external conditions. It is a place of exchange between opposing, and sometimes even conflicting, phenomena. The term has deep "social and emotional significance … [which, in Heideggerian terms has] … a directional bias associated with … moving from a less bounded to a more, private, contained space [and] an idea of entering" (Porter 2004: 193). But the threshold is not only a spatial device, it also fulfils a number of roles. It is at once utilitarian as it provides access, protective through the possibilities of closing and opening, and semantic through its ritual associations (Von Meiss 1990: 149). Architectural devices that are used to create thresholds can include "steps, eaves, loggias, alcoves, gates, doors, balconies and windows" (Von Meiss 1990: 135, 148). Steps, eaves, loggias and balconies are often dichotomous in their relationship with the fabric of the building, and its associated boundary, as they "make temporary and capital isolation possible while still belonging to a wider collectivity" (Von Meiss 1990: 135). They can be additive elements, acting as extensions to the building or, contrastingly, insertions that create depth in the *poché.*

Doors and windows are important architectural elements that can be used to define and articulate boundaries. Gaston Bachelard (1884-1962), a French philosopher, elicited the possibility of memory in domestic space through the use of poetry and expressive, psychological, meaning. His metaphorical understanding of the door was "an entire cosmos of the half open … The door schematises two strong possibilities … at times it is closed, bolted, padlocked. At others it is open, that is to say, wide open" (Bachelard 1994: 222), expressing movement. The door exhibits the possibility of control, welcoming and excluding and, although technological changes have made our lives more efficient, they have often lessened our architectural experience. "Every time I have to go from the pavement into the hall of the airport, I feel unpleasantly frustrated at the thought that my hands will not be required to open the door. Yet, whenever I am actually standing in front of those transparent doors, I automatically put out my hand to push it, even though it is opening before me" (Marc 1977: 9). But the door, as a transitional device, is not only the leaf. Lefebvre (1992: 209) highlights that the utility and meaning of the door frame makes it a spatial device that signifies the end of street and the beginning of room, and that without frame it would merely signify passage.

Windows are distinct from doors as they limit physical transition. Lefebvre (1992: 209) refers to them as transitional objects as they have two orientations, from outside to inside and inside to outside. The window "reverses the priority of destination" (Von Meiss 1990: 152) associated with a door and fulfils a range of functions, not only visually connecting the interior to the exterior but also providing light and ventilation, reinforcing its Norse etymology meaning "wind-eye". Beyond the metaphorical, utilitarian, protective and semantic roles the boundary, through its physical manifestation as a threshold, is also phenomenologically, and physically, expressed through the application of dynamic space, light and materials.

Sigfried Giedion's (1888-1968) seminal publication *Space, Time and Architecture* (1943) provided a critical understanding of spatial concepts in Modern Movement architecture. Two are important for an understanding of dynamic space. The first is the concept of space-time where a number of spaces could be visible at one point in time, through the so-called *promenade architectural*. The second is the concept of the interrelationship of spaces such as those in Adolf Loos' (1870-1933) Villa Muller (1930) in Prague (the *Raumplan*) and in Le Corbusier's (1887-1965) Villa Savoye (1928), the former through the central stair and interconnected volumes and the latter through the continuous movement route of the ramp and spiral stair. Dynamic space can also be described through the reciprocal relationship of viewers and those being viewed such as in Hans Scharoun's (1893-1972) Berlin Philharmonic concert hall (1963) where the circulation spaces were designed with as much attention as the theatres. Here the participant was also "on stage" as they arrived and left. Spatial dynamism is also constructed using light as it internally reflects external conditions, such as the diurnal movement of the sun.

Throughout architectural history, two approaches to the use of light are evident. One is an obsession with an architecture of light which results in the articulation of surface and volume, and the other is the use of light as an architectural form (Van Rensburg 2003: 20). The Pantheon (125AD) in Rome provides a resolution of both approaches, echoing Frampton's (1995: 226) description where a "room is not a room without natural light. Natural light gives the time of day and [allows] the mood of the seasons to enter". But the use of light goes hand-in-hand with shadow as light falls on various surfaces. The architect Sverre Fehn (1924-2009) highlights that "each material has its own shadow. The Shadow of stone is not the same as that of a brittle autumn leaf. The shadow penetrates the material and radiates its message" (Fehn in Dushkes 2012: 65).

The pragmatic use of building materials to provide protection from the elements, structure and spatial definition is allied by the possibilities of its phenomenological and behavioural qualities (Simitch and Warke 2014: 90, 94). Material qualities foster varying spatial experiences such as rough or smooth and translucent or transparent. But materials can "change" in time, through the path of the sun and over time, through a response to contextual conditions such as weathering.

Architectural history is richly peppered with examples of the making and articulation of the boundary, ranging from vernacular settlements to current-day developments. This is none more so than in southern Africa, where the unfortunate subjugation of indigenous architectural precedent such as Great Zimbabwe (ninth to fifteenth century) has, possibly, had an impact on extended innovation in boundary design. But there are a number of South African examples where the boundary, as an important architectural device, was consciously or unconsciously considered by architects. These include the imported Neo-Renaissance red-brick architecture in Pretoria at the turn of the twentieth century by Public Works Department architects such as Sytze Wierda (1839-1911), the rustic face-brick walls of Norman Eaton's regionalist designs (1902-1966), the layered thresholds of Louis Khan (1901-1974) students such as Roelof Uytenbogaardt (1933-1998) and Willie Meyer (1935-2006) and more recently, projects by Martin Kruger (1957-), Pinard Architecture[3] and Lumby and Lotz (L&L) architects.

[3] Guillaume Pienaar of Pinard Architecture has visited a number of Comrie's buildings, including the House at Johannesdal, and he notes that he respects Comrie's work (2022). (Pienaar, G. 2022. *Telephonic Communication*, 12 September 2022.)

However, the authors posit that the Cape Town-based architect and urban designer, Henri Comrie (1965 -), amongst many design approaches that he has used over his extensive career, has, for a long time, held a particular fascination with the making of boundary. This is consistently expressed in his work, which included various partnerships and collaborations over the years,[4] through a range of urban and architectural thresholds. His training as an urbanist has sensitised him to the clear demarcation of place while his architectural fascination with the stereotomic boundary fosters innovative explorations into the design of thresholds and their manipulation, through light and shadow, to control the internal spatial experience.

Comrie's design philosophy

Comrie argues that a "seductive showroom culture" and the internet of things have undermined the integrity of architecture, and he pleads for a simpler, more focused form of architecture that is regionally appropriate (both in terms of climate and available trades) and rooted in its place.[5] "Buildings have to fit their context and are firstly conceived as a response, either to what is already there in an established context, or to a surrogate context represented by a projective urban design framework when working on a greenfield site" (Comrie 2019: 185). Comrie actively searches for precedents in temperate climates, particularly in Spain and Portugal, where architects work with the minimum. He ascribes some of the techniques in his own work to indirect influences from Mexico, in particular the work of Luis Barragán (1902-1988).[6] He is convinced that one should not follow trends, but that one should follow one's own convictions. In relation to his own design philosophy, he cites the 2013 Cape Institute for Architecture award citation for the House at Johannesdal which describes it as "searching for the essential".[7] "This is probably a good definition of our now generally reductive work" (Comrie 2019: 185).

Comrie says that he is inspired by rule-breakers and some of his theoretical influences are Charles Jencks' (1939-) concept of multivalence, which he draws on in terms of the layering of meaning, Robert Venturi (1925-2018) and John Soane (1753-1857) because of their sense of humour (and the latter for his explorations with light), and Jonathan Barnett in terms of urban design theory (especially his use of narrative to demonstrate the need for negotiated trade-offs and creative compromise in real life situations). He also admires the craftsmanship of architects like Charles Correa (1930-2015) and Alvar Aalto (1898-1976) (Comrie 2019: 185). However,

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[4] In the 1990s, Comrie worked with 'Ora Joubert (1959-) before joining forces with Chris Wilkinson (1966-), whose pure delight in building and making he still admires. Comrie and Wilkinson were introduced by Gary White (1966-), and their relationship became formalised during the Melrose Arch project when Comrie + Wilkinson Architects and Urban Designers was founded in Pretoria in 1996. After Comrie completed his PhD studies in the United Kingdom, he relocated to Cape Town and continued to work in the same practice until he formed Urba Architects and Urban Designers with his wife Amálie as joint founding partner in 2012.

[5] Comrie, H. 2019. *Personal Interview,* conducted at Urba Architecture, Urban Design and Master Planning by Michael Louw on 4 June 2019.

[6] Comrie remarks that "I first came across the term 'quiet revolution' in the context of Barragán's work and feel that the associated restraint is increasingly being valued in a competitive arena where 'image' has come to dominate 'idea'" (Comrie 2019: 185). While one could argue that reduction as an approach can also result in image-making (particularly in the case of Barragán), if the making of image is not the primary aim, it can be used quite successfully as a device to achieve greater design clarity or legibility.

[7] Cape Institute for Architecture (CIfA). 2013. House at Johannesdal, Henri Comrie Architect and Urban Designer: Citation, *The Cape Institute for Architecture 2013 CiFA Award for Architecture*: np., as cited by Comrie 2019.

beyond these influences, it is the boundary and stereotomic form that stand out as urban and architectural devices that have guided Comrie's design approaches.

Figure 1
An image that formed part of the competition-winning entry for the Sol Plaatje University, Kimberley, 2013, that shows the effective combination of model building and hand drawing. The approach to boundary-making and the use of stereotomic form is clearly evident (retrieved from the public domain http://www.urba.co.za/competition-new-universities-kimberley/).

According to Comrie,[8] the use of stereotomic forms has become a constant in his architectural work. He claims not to have known about the word until fairly recently, as he simply used the techniques of thickened walls, the contrasting of shaded planes versus sunlit ones, and windows or glazed areas that are smaller than would normally be expected. He contrasts this way of working with some of Cape Town's Atlantic Seaboard buildings, which he describes as "tectonic, high-tech, shiny and concerned with wealth", although he does respect the skill and discipline that is required to make them a reality. "Working in a stereotomic mode is also more appropriate than working in a tectonic mode in large parts of South Africa, both as a climatic response and in response to available trades" (Comrie 2019: 185). This attitude demonstrates some consideration of local socio-economic conditions, especially related to the South African construction industry. Working with materials like brick and concrete allows a semi-skilled labour force to access the industry more easily than would be the case if materials are used that require an advanced level of specialised skills. This type of construction also has the possibility of keeping construction costs down if it is well-considered.[9]

[8] Comrie, H. 2019. *Personal Interview,* conducted at Urba Architecture, Urban Design and Master Planning by Michael Louw on 4 June 2019.

[9] While there have recently been a number of experiments (mainly in the global North) that use digital design and manufacturing to achieve stereotomic form, these techniques have not gained much traction in the local South African context. This may be due to cost and a lack of specialised skills, but it may also face some opposition since it could reduce the number of job opportunities in the short term (despite the fact that it may contribute to the development of specialised skills).

Comrie admits that his architectural affinities lie with the Cape vernacular way of building, such as in the work of Gawie Fagan (1925-2020), Martin Kruger (1957-)[10] and, more recently, L&L architects.[11] Comrie argues that "buildings should only become better in use or should otherwise make for spectacular ruins, which means that a heavy and honest outer shell of solid walls is, in our view, always a good idea" (Comrie 2019: 187). He laments that architects in South Africa have lost their affinity with local vernaculars, and he writes that "Africa is a humble and soulful place where we mostly still build in an age-old tradition of brick and mortar" (Comrie 2003c: 36). Comrie sees himself working in the vein of Gawie Fagan's reinterpreted rural vernacular where openings are smaller, views are framed and not continuous, and the use of indirect light becomes important, particularly when using materials that are forgiving as they provide an imperfection that is impossible with tectonic expression. This view echoes Kench's description of the German immigrant architect Pius Pahl (1909-2003) whose architecture in the Cape drew heavily on the local vernacular: "Here is the spirit both of the craftsman and of the conscious artist, sensitive to the lie of the site, to the effects of light and shadow, and to the three-dimensionality of a building. He has a strong sense of architecture as sculpture, feeling that a building, like a sculpture, should be approachable from all angles" (Kench 1988: 45). Comrie mainly relies on brickwork to achieve his stereotomic design goals. He regards the brick as a timeless building material. He often makes use of flush-jointed brickwork, and he remarks that it requires careful consideration, especially on building corners, to make the geometric forms appear crisp. While the flat surfaces can be textured and have variation and imperfections, stays should be used on corners and the bricks used should be carefully selected.[12]

Comrie explains that his architecture's "volumes and apertures [are] carved from what is essentially a homogenous brick mass [recognising that the] reductive approach has been called primitive modern in the context of the work of the Dutch minimalist Hans van der Laan" (1904-1991) (Comrie 2019: 185). Comrie highlights that his design approach is both intuitive and scientific, where building mass is hollowed out, and the effect of light is tested (specifically through the building of physical models). He adds that South Africa is spatially impoverished due to architects' automatic adherence to building regulations which determine that ceilings are usually 2400mm high and walls are 230mm thick (or 280mm along the coast). He would like to see architects design ceiling heights and wall thicknesses to what they should be, and not to the minimum that the building regulations require. While this seems to contradict earlier concerns about costs, the relative improvement in terms of spatial qualities could outweigh economic concerns. His design process similarly mimics the carving away of a solid mass, and he describes his process as drawing, discussing and adjusting. This is then translated into a presentation drawing, which becomes a conduit to solicit a response. "*Begin net iets en skaaf en skaaf. Dis waar die* joy *is*." [Start to carve and carve. That is where the joy is].[13]

Further stereotomic influences are gleaned from international architects such as Gillespie, Kidd and Coia, David Chipperfield (1953-), and Peter Zumthor (1943-), especially the latter architect's 2007 Kolumba Museum in Cologne. Comrie states that he has also been fascinated

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[10] See article in *Architecture South Africa*, June/July 2019.

[11] See article in *Architecture South Africa*, May/June 2018.

[12] Comrie, H. 2019. *Personal Interview,* conducted at Urba Architecture, Urban Design and Master Planning by Michael Louw on 4 June 2019.

[13] Comrie, H. 2019. *Personal Interview,* conducted at Urba Architecture, Urban Design and Master Planning by Michael Louw on 4 June 2019.

by Kahn's consciousness of light and the way that his buildings seem to have different moods. Here he finds himself in good company, and in a line of influence in South Africa, with architects like Roelof Uytenbogaardt (1933-1998), Willie Meyer (1935-2006), Glen Gallagher (1935-2010), Danie Theron (d 2011), and others having studied under Kahn. Comrie emphasises the importance of residual space, making use of Louis Kahn's strategy of inhabited walls (as used in the 1961 Esherick House), referring to his own former house in Pretoria where he used 230mm brick walls to create U-shaped recesses that make the walls seem thicker than they actually are. He remarks that Esherick House is one of his "all-time favourites" and that it in turn "was influenced by the thick walls of Scottish castles … that make beautiful ruins".[14]

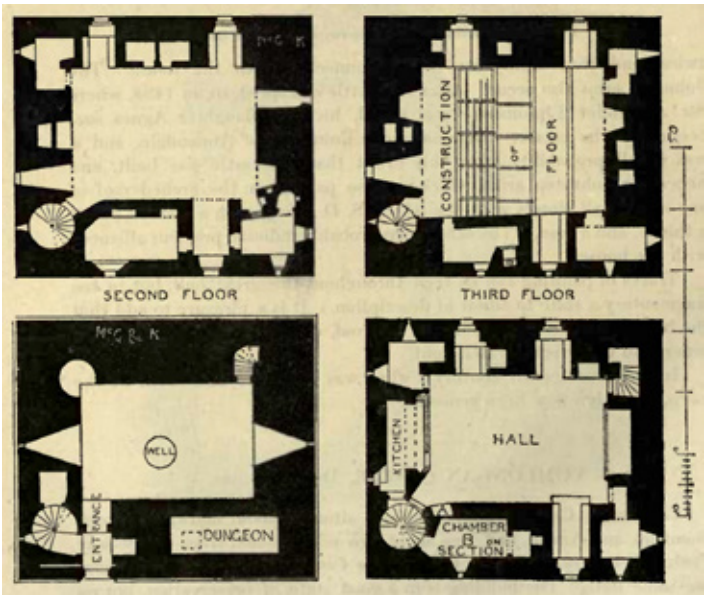

Figure 2
Plans of Comlongan Castle, Dumphriesshire, Scotland
(source: MacGibbon and Ross 1887-1892: 238).

Dynamic space (movement)

Comrie adopts a design approach that aims to create a dynamic spatial experience within stereotomic forms.

I recognise a similar serendipitous approach in the craft-oriented work of Correa, Herman Hertzberger (1932-), Barragán, Alvaro Siza (1933-) and Zumthor. Correa has perhaps been the greatest influence. He was a craftsman of space with an ability to work with great skill across a range of scales, from single residential to urban. The work is deceptively simple on the surface but extremely rich in experience and meaning. It is a dynamic architecture that is difficult to capture through photography because it is concerned with the movement of the visitor/user

[14] Vincent Scully notes that Kahn had a copy of MacGibbon, D. and Ross, T. 1887-1892. *The castellated domestic architecture of Scotland from the twelfth to the eighteenth century*, Vol. 1, Edinburgh: David Douglas on his desk. See Scully, V. 1962. *Louis I. Kahn.* New York: George Braziller, Inc: 39. See also Brownlee, D.B. and De Long, D.G. 1991. *Louis I. Kahn: In the realm of architecture.* New York: Rizzoli International Publications Inc.: 107. Comrie, H. 2019. *Email Correspondence,* 12 July 2019.

through a series of interlinked spaces. The Alhambra-like choreography results in the varied spaces associated with the building needing to be visited and explored to be fully appreciated … some enclosed, some open to the sky, some of high volume, some of low volume, some directly lit, some indirectly lit, some vibrant, some quiet, etcetera. Each part is simple when read in isolation but becomes more complex when read as part of an interlocking sequence of spaces or parts. Like Correa we imagine ourselves being on a journey by which each building is conceptualized as a small city with the whole being greater than the parts (Comrie 2019: 186-7).

Comrie mentions Aldo van Eyck's (1918-1999) view that buildings should be regarded as small cities with streets and squares and that there should be a blurring of boundaries between inside and outside as in the Nolli map of Rome. Comrie also cites the spatial influences of one of the rather unsung early Modern Movement heroes, Adolf Loos, whose *Raumplan*, organised through horizontally and vertically connected spaces, was expressed within a strong cubist envelope (Comrie 2019: 185).

Comrie often arranges his buildings around primary routes that are as clearly defined as a Roman inspired *Cardo* and *Decumanus*. This primary device allows for incremental expansion over time. The secondary routes and circulatory systems that lead off these armatures are, however, diverse. This approach can be seen in House at Johannesdal (2013) which, similar to Correa's work, was conceptualised as a small city or as an urban design project. Comrie cites the work of Barragán and the way in which he arranges his spaces around specific routes,[15] expressing an internal circumnavigation with controlled pinching and release of internal volumes, and he also mentions Carlo Scarpa (1906-1978), especially his interventions for the Castelvecchio Museum (1963-1965) which were conceived and retrofitted as promenades or routes. Comrie argues that urban designers are fascinated by two layers that architects in South Africa mostly fail to recognize at the building scale: the semi-public and semi-private. In his opinion, architects generally only use public and private with a wall in-between. He notes that these other two layers have influenced his architecture, even when designing private houses through extended thresholds and thickening of interfaces.[16]

Light

Comrie manipulates light in his architecture to reinforce internal spatial dynamism, directionality and hapticity. Architects, throughout history, have influenced Comrie's conscious adoption of an architecture of light expressed through the articulation of surface and volume, and the use of light as an architectural form. Comrie cites Loos' *Raumplan* and he notes that "the choreography and inherent serendipity provides a dynamic that is concerned with discovery and delight through movement and the varied ingress of natural light" (Comrie 2019: 186). In Barragán's work he appreciates the organisation of movement of space through light, and in Kahn the internal definition of space.

[15] Comrie, H. 2019. *Personal Interview,* conducted at Urba Architecture, Urban Design and Master Planning by Michael Louw on 4 June 2019.

[16] Comrie, H. 2019. *Email Correspondence,* 12 July 2019.

Figure 3
Patterns of natural light are generated by perforations in the stereotomic brick skin. Sol Plaatje University Building 1: Educational Training Centre, Kimberley, 2018, Urba (retrieved from the public domain http://www.urba.co.za/sol-plaatje-university-building-1/. Photograph by Dave Southwood).

Comrie reinforces his stereotomic, and anti-tectonic, approach through his belief that "it's not always about views – it's often just about light and that there needs to be a controlled tension between that which is open and closed".[17] He therefore pays great attention to the design of openings through the *poché* to take advantage of specific framed views, to allow light in from various angles, such as in clerestories, to create a specific or changing mood (depending on the time of day) and to facilitate the comfort of an internal functional condition. In addition, light is used to heighten the platonic nature and textural qualities of building materials, particularly brickwork in all its forms. The design process is facilitated by the extensive use of physical models, where the use of light is tested with torches in an intuitive, yet scientific, way.

The urban boundary

At a macro level, Comrie has shown a keen interest[18] in the urban boundary of cities – where the city ends and the countryside begins, and the morphological character of this boundary. He sees this boundary, or "edge city" as the most dynamic part of the city, and he is of the opinion that this is particularly significant in South Africa, where urban edges were purposefully designed to segregate communities by race: "The size of the dusty edge city is many, many times that of

[17] Comrie, H. 2019. *Personal Interview,* conducted at Urba Architecture, Urban Design and Master Planning by Michael Louw on 4 June 2019.

[18] See Comrie (1995: 53-6; 2003a: 103; 2003b: 247).

the colonial cores" (Comrie 2003a: 103; 2003b: 247). He goes on to say that "What we do know is that what exists must change because the edge (which is also a wall) has become sensitive to South Africa's current paradigmatic shift" (Comrie 1995: 56).

Comrie emphasises the importance of clearly defined edge conditions in both his architectural and urban design work, an approach which echoes the thinking of one of his heroes, Louis Kahn (1901-1974), whose "preoccupation with the idea of hollow structure was to unify his thinking at both an architectural and an urban level" (Frampton 1995: 225). Buildings are seen by Comrie as containers with defined edges providing "urban design principles of 'robustness' … that require the spaces between buildings [to be] designed for flexible use, as is the need for the buildings themselves to be arranged flexibly internally to create vibrant, people-oriented environments and ultimately ...to achieve a balance between what is formal and what is playful and open to user interpretation" (Comrie 2019: 187).

Similar to Comrie's institutional and domestic work, the defined edge conditions or boundaries are used to frame clear movement routes and open spaces. In the 2013 Urban Design Framework for Nacala in Moçambique (by Urba in association with ACG Architects, with Malcom Campbell of ACG leading the team) boundary is created through the use of perimeter blocks that front streets and squares in order to define public space. Similar to the design approaches for the Johannesdal and Aperture houses, the urban design framework makes use of two clearly defined primary axes that link carefully positioned outdoor "living rooms", while the city blocks are treated as articulated stereotomic masses that provide enclosure for the semi-private internal courtyards. The model also shows the consideration of natural light, and it communicates a sense of a carving away of building mass to accommodate specific uses. Comrie admits that "Accepting mass as a given and carving the in-between spaces is a very challenging and rewarding part of the design process" (Comrie 2009: 20).

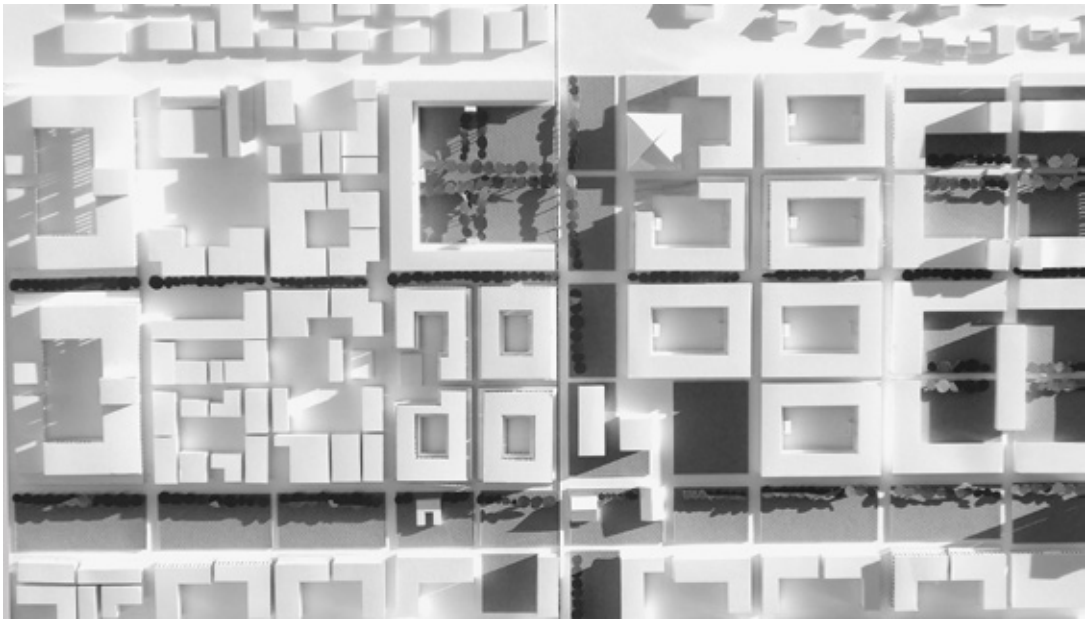

Figure 4
A photo of a model for the Nacala Urban Design Framework which shows the orientation around two primary axes and the clear definition of boundary conditions. Urban Design Framework for Nacala, Moçambique, Urba in association with ACG Architects, with Malcom Campbell of ACG leading the team, 2013 (retrieved from the public domain http://www.urba.co.za/nacala-framework/).

The framework for Devonbosch near Stellenbosch provides a clear and robust hierarchy of streets and supportive built form as found in older, walkable settlements of the Western Cape. The underlying principles have since largely been forgotten in the rush towards novelty in object-making. The purpose of buildings within the framework is firstly to support vibrant streets, whilst not diminishing the capacity of each building to meet all the usual needs of a building. Comrie emphasises the importance of creating a sense of enclosure at different scales: "Beyond the precinct a further four hierarchies need to be defined and the thresholds and interfaces between them properly 'crafted'. The hierarchies include public, semi-public, semi-private and private spaces in different arrangements" (Comrie 2009: 19).

Figure 5
Devonbosch medium density mixed use precinct, Stellenbosch Municipal Region, 2019, Urba Architecture and Urban Design (source: Urba Architecture and Urban Design).

In the 2009 Middle Campus Urban Design Framework for the University of Cape Town (UCT) (Comrie + Wilkinson Architects and Urban Designers)[19] the scale of the spaces between buildings and the massing of the individual buildings were also carefully considered, but the interface of boundary conditions of the buildings with open spaces are key to the framework's success. Comrie is of the opinion that "Designers need to consider the interface as a continuous, creatively moulded and punctured wall…" (Comrie 2009: 20). In the UCT framework, this is achieved through a spatial layering with extensive roof cover, exaggerated scale, and colonnades that edge the open spaces to control movement between buildings. A hand drawing by Comrie also demonstrates the use of thickened walls, a clearly defined axis, and the consideration of natural light.

[19] The buildings were completed by VDMMA in 2011.

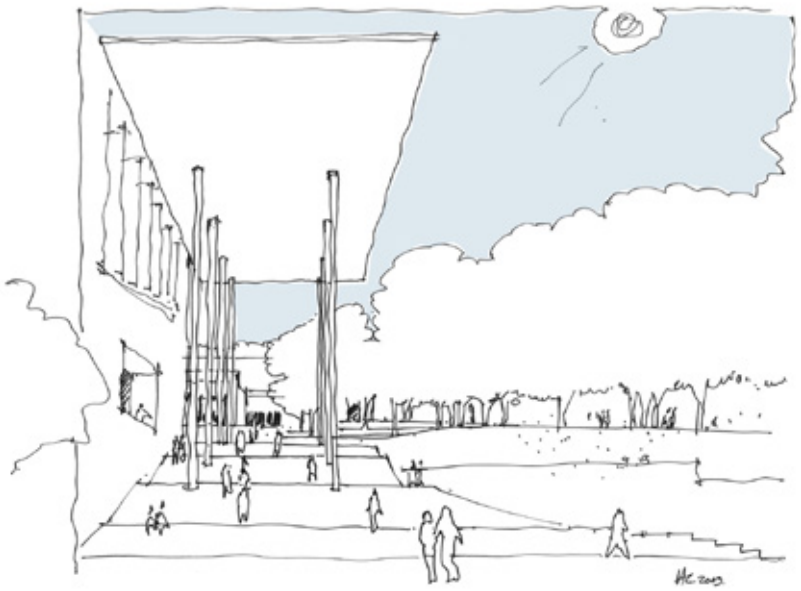

Figure 6
A drawing showing the scale and boundary conditions that were envisaged for the buildings on UCT's Middle Campus. UCT Middle Campus Urban Design Framework, Comrie + Wilkinson Architects and Urban Designers, 2009. Drawing by Henri Comrie (retrieved from the public domain http://www.urba.co.za/uct-middle-campus/).

The institutional boundary

Institutional architecture straddles the public and private realms as it mediates the needs of protected space and a direct, inviting connection to the outside world. Comrie's design of institutional buildings (many the result of architectural competitions) extends his domestic architectural approach, but the response in terms of boundary is usually determined by the urban context, or it is formed in such a way so as to define the urban realm. "Because we consider each building part of something larger, even if located in a vast open landscape, we typically design buildings in a reductive or minimalist mode using simple orthogonal forms and a limited range of readily available materials" (Comrie 2019: 185). The making of the boundary in Comrie's institutional buildings is multi-layered but often minimally punctured, which limits the possibilities of access and direct external spatial and functional responses. Comrie and Jacobs (2010: 41) highlight the use of "urban layers" in Cape Town Stadium's Urban Design Framework (2007-2010), for which Comrie was lead urban designer in association with Khalied Jacobs of Jakupa, and OvP Landscape Architects. They go on to say that "The various designed elements are layered, and boundaries are blurred" (Comrie and Jacobs 2010: 46).

The campus of the Gordon Institute of Business Science (GIBS) in Johannesburg (1996-2013) "was developed in three phases. What started out as a small group of buildings soon had the makings of a small town as the success of GIBS … led to the demand for more space".[20] The stereotomic defensibility of the external walls of GIBS hides a more permeable interior. The main courtyard is at the heart of the project, facilitating cross-axial links to later additions. A number of distinct courtyards, quads and seating alcoves, recalling the classically defined loggia,

[20] http://www.urba.co.za/gibs/.

have been created to facilitate departmental hierarchy and movement while their articulation "successfully blur[s] the distinction between formal teaching and spontaneous interaction". It is, however, the internal boundary conditions that receive more design attention. Each courtyard is given its own identity by being articulated differently through size, scale, increased wall thickness, column articulation and the play of light on the ochre-coloured walls. In contrast, Comrie places more emphasis on the articulation of the internal circulation boundary in the unbuilt 2009 SAIA-endorsed national competition winner for the Premier's Office in Bhisho. One main axis controls movement while a number of, shorter, cross axes link to the various parliamentary spaces. These are balanced by the introduction of repetitively articulated spaces that act as service spaces between the main functions.

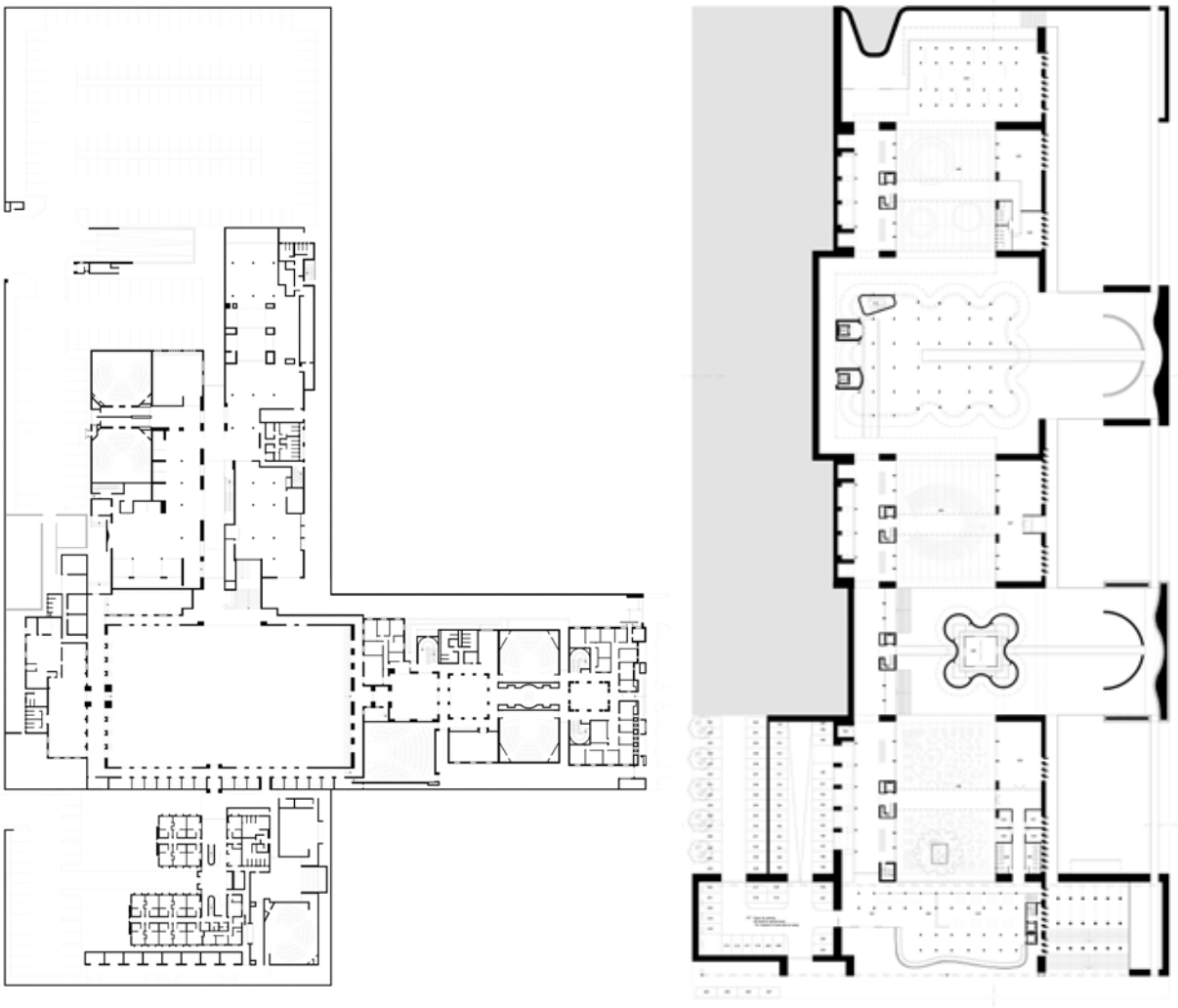

Figure 7a
Left: Articulation of courtyard edges. Gordon Institute of Business Science (GIBS), Johannesburg, South Africa 1996-2013. (retrieved from the public domain http://www.urba.co.za/gibs/).

Right: The 2009 competition-winning entry for the Premier's Office in Bhisho (retrieved from the public domain Urba, 2009, http://www.urba.co.za/competition-bisho-premiers-office/).

Figure 7b
Left: Articulation of courtyard edges. Gordon Institute of Business Science (GIBS), Johannesburg, South Africa 1996-2013 (retrieved from the public domain http://www.urba.co.za/gibs/).
Right: The 2009 competition-winning entry for the Premier's Office in Bhisho (retrieved from the public domain Urba, 2009, http://www.urba.co.za/competition-bisho-premiers-office/).

The 2013 Sol Plaatje University Campus was initiated through a two-stage competition, each of the five shortlisted architects being allocated a parcel of land of roughly similar size on which to develop a design for construction.[21]

The three-dimensional envelopes of the buildings were generated by Ludwig Hansen Architects and Urban Designers,[22] which meant that the practices that were selected for the various buildings had to work inwards from these boundaries. After being selected as a competition winner, Urba was allocated a different parcel to the one that they initially worked on, but Comrie[23] remarks that it did not concern them, as their architectural approach could be easily adapted to suit another site. The Sol Plaatje University Education building, along with the more recent Sol Plaatje University Auditorium building, represent Comrie's most mature development of the *poché*, as a number of deep thresholds mediate and blur the conditions between inside and outside. The urban formal response is reminiscent of the Spanish architect Manuel Aires Mateus' (1963) stereotomic explorations such as the 2005 Sines Centre for Arts. The *poché* provides a controlled sequence of dynamic movement, generated by various entrances that lead to the main circulation routes, and as urban interventions, with constrained internal space, Comrie focuses his attention on the articulation of the external boundary. The buildings' stereotomic brick masses are punctuated by various openings that relate to internal and external conditions, while inner layers add colour and complexity to the three-dimensional form. Punctured openings of various shapes and sizes modulate natural light, while curved edges soften the building's monolithic form and foster positive urban corners.

[21] http://www.urba.co.za/sol-plaatje-university-building-1/.

[22] http://www.ludwighansen.co.za.

[23] Comrie, H. 2019. *Personal Interview,* conducted at Urba Architecture, Urban Design and Master Planning by Michael Louw on 4 June 2019.

Figure 8
The predetermined three-dimensional envelope at the Sol Plaatje University Education building was treated as an excavated mass. The wall thickness was proportionally scaled up to suit the size of the building. Sol Plaatje University Education building, Kimberley, 2018, Urba Architects and Urban Designers (retrieved from the public domain http://www.urba.co.za/sol-plaatje-university-building-1/. Photos by Dave Southwood and Henri Comrie).

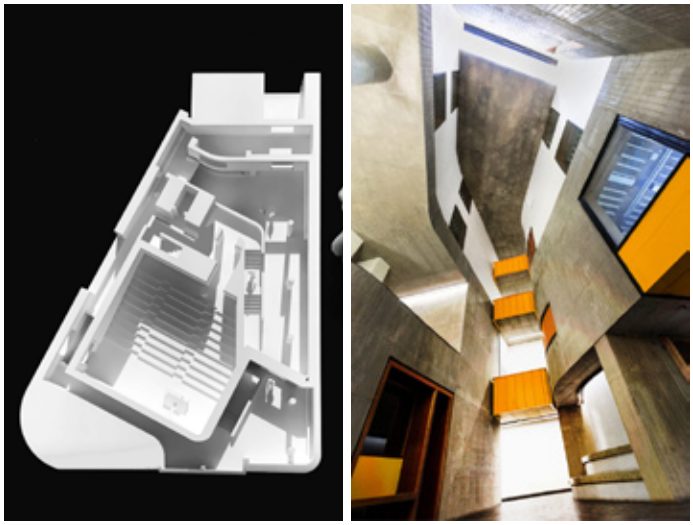

Figure 9
Left: The clear application of stereotomic form and *poché* shown in a model of the Sol Plaatje University Auditorium Building, Kimberley, 2022, Urba Architects and Urban Designers (source: Urba Architects and Urban Designers).
Right: A photo of the interior showing the dynamic space and light conditions on the interior of the building (retrieved from the public domain https://www.urba.co.za/sol-plaatje-university/. Photograph by Dave Southwood).

The domestic boundary

The antecedents of many of Comrie's formal explorations can be seen in a compact residence on a small site in Newlands, Pretoria, completed in 1997. The house was designed by Comrie and his wife Amálie for themselves (on a tight budget), but they managed to mitigate the small footprint by using generous floor-to-ceiling heights while enabling a mediated spatial relationship between the inside and outside. Comrie calls it an infill-exercise and he says "*ons het 'n mate van beheer gehad oor die evolusie van die wande*" [we had some control over the evolution of the walls] (Comrie 1998: 42). The stereotomic building blocks are arranged to create a series of spatial boundaries between street and garden. This definition is further enhanced through the articulation of the blocks, particularly the garden edge where the use of U-shaped walls generates a sense of thickness without losing space. Dynamic spatial movement originates from the side entrance which is positioned beyond a glazed corner that protrudes from the main facade. The visitor looks to the garden beyond as a glimpse of what is to come and is then turned at 90 degrees to the entrance axis and, once again when inside, is faced with a corner window that is reminiscent of Scarpa's Canova Museum (1955-57), simultaneously drawing views up and light down. According to the architects, "House Comrie was the beginning of a trajectory of awarded built projects, often of much larger scale e.g. the Gordon Institute of Business Science, that demonstrates un-pretentiousness in material use but which proved popular with its users because of the quality of in-between spaces defined by conventional brickwork".[24]

Figure 10
The sense of thickness and light control that is generated by the U-shaped brick walls at House Comrie is clearly evident, and the emphasis on a strong inside-outside relationship can be seen in the generous staircase leading to the garden from the deeply recessed doors and the protruding corner window. House Comrie, Newlands, Pretoria, 1997, Henri and Amálie Comrie (retrieved from the public domain http://www.urba.co.za/house-comrie/. Photograph by Leon Krige).

[24] http://www.urba.co.za/house-comrie/ .

The design elements and considerations that were employed for House Comrie (stereotomic masses, thickened walls, the consideration of natural light and clear inside-outside relationships, amongst others) are also clearly evident at House Steyn (1997), which was completed in Pretoria in the same year. According to Comrie, this house was particularly influenced by the work of Barragán and Correa, and the design sketches express a relationship to semi-private space which demonstrates a new additional, internalised, consideration of threshold and boundary. The courtyard gains prominence through thickened walls to house sliding doors, the indoor braai and upper level bath "balcony". These considerations are further articulated in houses like House Coetzee in Big Bay, Cape Town (2009), where, as a result of the tightly constrained site, semi-private courtyard spaces and screened balconies allow an engagement with the natural context without impacting on the privacy of the residents or their neighbours. Similar to the previous houses, a circuitous front entrance allows for indirect engagement with the semi-private outside space, while the openings towards the opposite end of the houses have a very direct relationship with the outside.

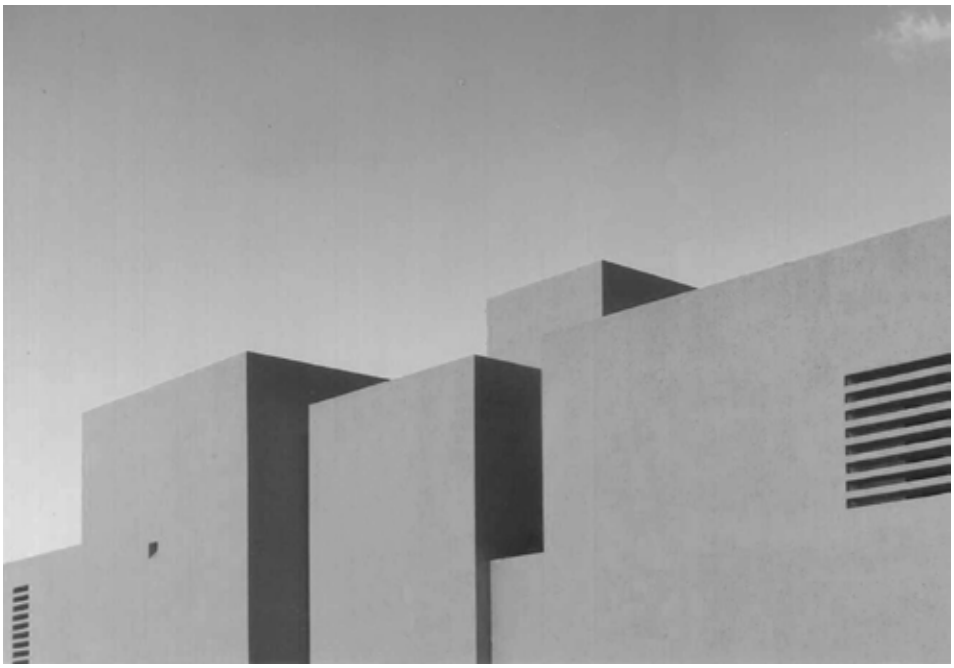

Figure 11
The articulated composition of stereotomic forms at House Steyn in Pretoria which was completed in 1997, already shows a considered design approach in terms of massing and the consideration of natural light both in terms of its effect on external form, and on the internal spatial conditions (retrieved from the public domain http://www.urba.co.za/house-steyn/. Photograph by Leon Krige).

Later domestic work such as House at Johannesdal (Urba 2013) and Aperture House (Urba 2019) show an even more explicit intent in terms of the articulation of architectural boundaries. The front entrances are sometimes more direct, but they are marked by a series of thresholds that allow engagement with semi-private outside spaces and a range of ancillary spaces before reaching the primary living space. The openings towards the rear still have a direct physical connection to the context, but they are increasingly recessed, and the use of thickened walls is even clearer and more varied than previously.

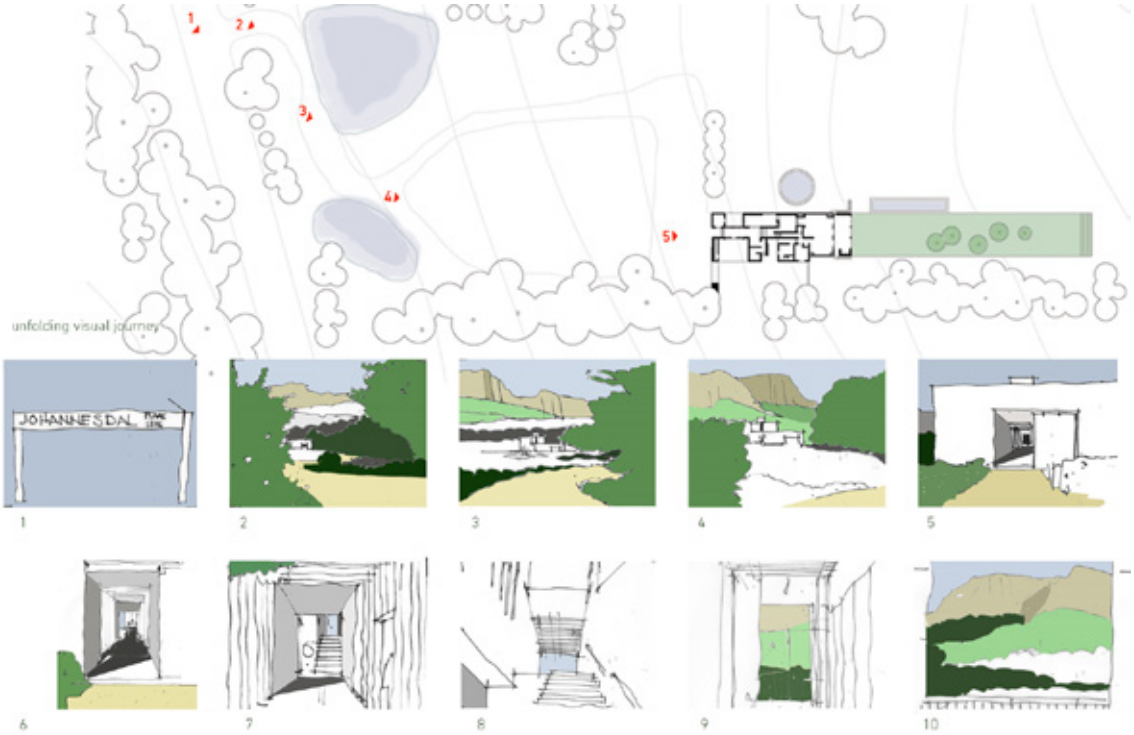

Figure 12
A series of hand drawn vignettes that show the pedestrian entrance into the house, the progression through various thresholds, and the final direct engagement with the context which is a metaphoric reconnection with nature. House at Johannesdal, 2013 (retrieved from the public domain Urba, http://www.urba.co.za/johannesdal/).

The rear façade of the House at Johannesdal echoes the experiment with recesses in House Comrie, but their external expression is enhanced by the contrasting steel frame and the varying expressions of light and volume from inside. According to the architects, "The gallery-like internal volumes are of varied size and carved from a heavy, pure white mass made of humble brick".[25] This statement shows a clearer conceptualization of bounded masses which are carved out to create internal volumes, and at Aperture House (2019), the bounded masses are modulated further by an additional layer of tectonic screens and planting. Comrie's original limited attention to the roof element as *poché* is fully explored in House at Johannesdal, where the vertically extended forms attempt to respond to the scale of the surrounding environment, and "the ceilings are substantially higher than normal, giving the main mass a cubic boldness" (Cooke 2014: 10), while various pergolas and roof lanterns provide vertical thresholds articulated by light.

[25] http://www.urba.co.za/johannesdal/.

Figure 13
House at Johannesdal, Urba, 2013. This house was conceptualised as a series of stereotomic masses that were carved out to create a dynamic series of internal volumes (top image retrieved from the public domain https://www.urba.co.za/johannesdal/. Photographs by Bureaux/ Peter Kreinhofner. Bottom image courtesy of Henri Comrie).

House at Johannesdal and Aperture House also show a definite consideration of the house as a small city or as an urban design, where the internal circulation routes have evolved into having much clearer hierarchies and legibility. According to Comrie,[26] the internal circulation is planned around clearly defined x and y axes, while both internal and external spaces are regarded as scaled inner city squares or building blocks.

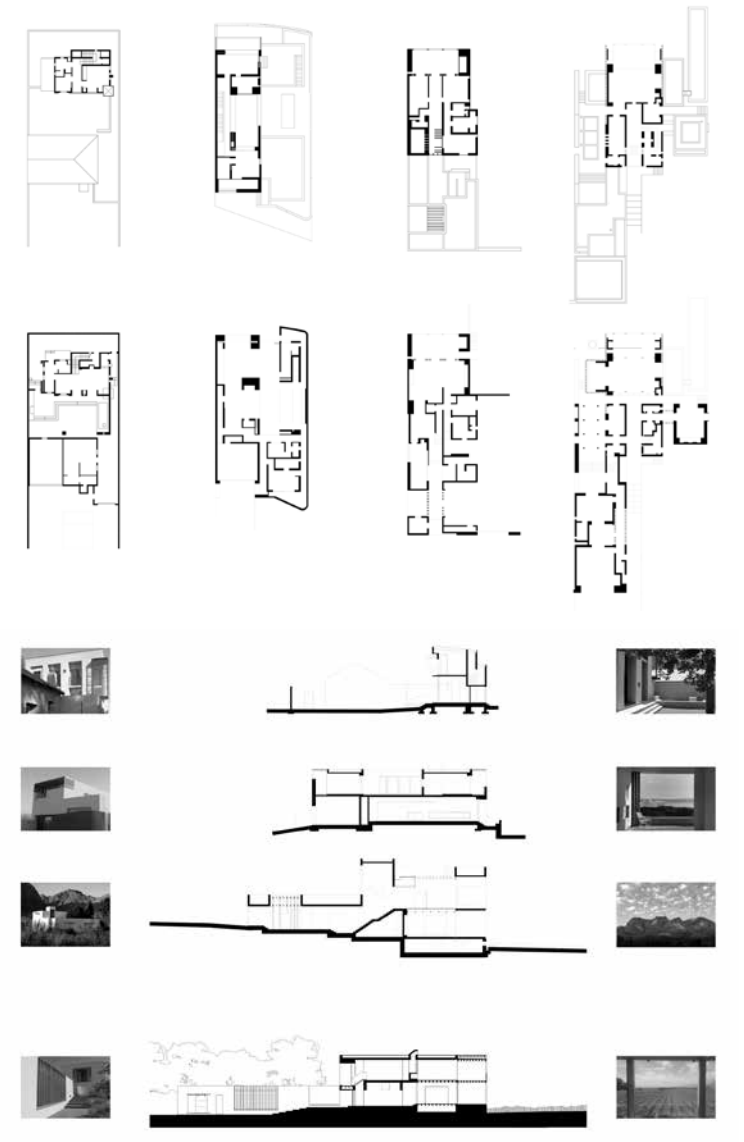

Figure 14
The floor plans of House Comrie (1997), House Coetzee (2009), House at Johannesdal (2013) and Aperture House (2019) from left to right, with first floor plans above and the corresponding ground floor plans below. The plans give a sense of the distribution of massing, and they clearly show the evolving clarity of the circulation routes and the increased employment of different wall thicknesses. The sections show the relationship with the earth and sky, with photos of views of the houses from the front on the left, and photos of views towards the context on the right (Urba, adapted by authors).

[26] Comrie, H. 2019. *Personal Interview,* conducted at Urba Architecture, Urban Design and Master Planning by Michael Louw on 4 June 2019.

Conclusion

The well-defined presence of boundaries between city and nature, street and building and within buildings, throughout history, is key to the definition, and control, of internal and external space. Boundaries are both physical and phenomenological and fulfil utilitarian and protective roles. The transition between edge conditions, through the development of *poché*, provides architectural opportunities for varying definitions of thresholds in urban design and architecture.

Comrie's understanding of place through his nomadic youth, student travel, overseas working opportunities and post graduate study have sensitised him to the nuances of context and, in our condition, particularly through responsive climatic design. He has over the years, and through a wide range of project types, developed considered design strategies that encompass the specific definition of architectural and urban boundary and dynamic spatial movement framed through stereotometry and light. Few local practitioners' works reveal such a consistency, and clarity, in terms of the investigation of specific architectural and urban strategies throughout their careers. Comrie's work demonstrates the value of "carving away" at an individual project to successfully hone design strategies over time.

From initial domestic experiments to extensive urban investigations, Comrie has consistently developed his stereotomic approach to massing and the use of *poché* to mediate internal and external conditions. His considered articulation of the boundary is dependent on context, most often focused externally on urban buildings and internally in residences. Over time, the boundary has increasingly been articulated, often becoming an inhabited wall with functions, while lately it is further layered with tectonic sensitivity. The development of Comrie's architecture and urbanism exhibits a continued "search for the essential" demonstrating an increasing coherency of design approach and conceptualisation, where domestic becomes urban and urban, domestic.

Works cited

Bachelard, G. 1994. *The Poetics of Space*. Boston: Beacon Press.

Comrie, H.P. 1995. *Social Choice: A Framework for Collective Decisions and Individual Judgements within a Cross-cultural society.* Unpublished Masters in Urban Design thesis. Johannesburg: University of the Witwatersrand.

Comrie, H. 1998. Klein ruimte, vrygewige skaal, *SA Architect*, July 1998: 41-4.

Comrie, H. 2003a. Guest editorial, *Urban Design International* 8: 103-4.

Comrie, H. 2003b. Streetsweeper, *Urban Design International* 8: 247-8.

Comrie, H. 2003c. The beds are better in France, *Image & Text: A Journal for Design* 10: 36.

Comrie, H. 2009. Three precinct scale projects, *Architecture South Africa* March/April: 18-21.

Comrie, H. and Jacobs, K. 2010. Urban design: Beyond object, in *Cape Town Stadium: Between the Lines*, edited by Bettina Andrag. Johannesburg: Griffel Media: 34-51.

Comrie, H. 2019. URBA architecture / urban design / master planning, in *Boukunde. 75th Anniversary of the Department of Architecture, University of Pretoria* edited by A. Barker. Pretoria: University of Pretoria.

Cooke, J. 2014. House Johannesdal, Pniel. Architecture in Place, *Architecture South Africa*. *Journal of the South African Institute of Architects.* March/ April: 10-13.

Dushkes, L.S. (ed). 2012. *The Architect Says. Quotes, Quips, and Words of Wisdom*. New York: Princeton Architectural Press.

Eisenman P. 2007. Processes of the interstitial, in *Written into the Void. Selected Writings 1990-2004*. New Haven, Connecticut: Yale University Press.

Enquist Källgren, K. 2020. Exile boundary crossing: Aesthetic objects and perception in the works of Walter Benjamin and María Zambrano, *European Review* 28(3): 403-15. Retrieved from doi:10.1017/S1062798719000528.

Frampton, K. 1990/2002. Rappel à l'ordre: The case for the tectonic, in *Labour, Work and Architecture: Collected Essays on Architecture and Design*. London: Phaidon Press Inc.: 90-103. First published in *Architectural Digest* 60 (3/4), 1990: 19-25.

Frampton, K. 1995. *Studies in Tectonic Culture: The Poetics of Construction in Nineteenth and Twentieth Century Architecture*. Cambridge, Massachusetts: MIT Press.

Frampton, K. 2002. *Labour, Work and Architecture: Collected Essays on Architecture and Design.* London: Phaidon Press Inc.

Giedion, S. 1943. *Space, Time and Architecture: The Growth of a New Tradition.* Cambridge, Massachusetts: Harvard University Press.

González, J.J.C. and D'Acunto, P. 2016. *Stereotomic Models in Architecture. A Generative Design Method to Integrate Spatial and Structural Parameters through the Application of Subtractive Operations*, retrieved from https://www.researchgate.net/profile/Juan_Castellon3/publication/305397591_Stereotomic_Models_in_Architecture/links/578cefe808ae5c86c9a64cdc.pdf on 8 July 2019.

Heidegger, M. 1951. *Building Dwelling, Thinking,* retrieved from https://www.academia.edu/34279818/Building_Dwelling_Thinking_by_Martin_Heidegger_Translation_and_Commentary_by_Adam_Bobeck_ on 28 June 2019.

Kench, J. 1988. Pius Pahl: A balance of freedom and discipline, *Architecture South Africa. Journal of the South African Institute of Architects*, 1988(3/4): 43-5.

Leach, N. (ed). 2002. *Rethinking Architecture. A reader in Cultural Theory*. London: Routledge.

Lewcock, R. 2006. 'Generative concepts' in vernacular architecture, in *Vernacular Architecture in the Twenty-First Century*, edited by L. Asquith and M. Vellinga. London: Taylor and Francis: 199-214.

MacGibbon, D. and Ross, T. 1887-1892. *The Castellated Domestic Architecture of Scotland from the Twelfth to the Eighteenth Century* 1, retrieved from https://archive.org/details/castellateddomes01macguoft/mode/2up on 3 October 2022.

Marc, O. 1977. *Psychology of the House*. London: Thames and Hudson.

Meisenheimer, W. 2011. Of the hollow spaces in the skin of the architectural body, in *Toward a New Interior. An Anthology of Interior Design Theory*, edited by Lois Weinthal. New York: Princeton Architectural Press: 625-631.

Moffett, Kenneth. 1994. The wall in recent architectural form: A pattern of evolution toward autonomy, *Journal of Architectural Education* 47(4): 242-57. Retrieved from https://www-jstor-org.uplib.idm.oclc.org/stable/1425341?seq=1#metadata_info_tab_contents on 8 July 2019.

Norberg-Schulz, C. 1983. Heidegger's Thinking on Architecture, *Perspecta* 20: 61-8.

Porter, T. 2004. *ArchiSpeak: An Illustrated Guide to Architectural Design Terms*. London: Spon Press.

Semper. G. 1989. *The Four Elements of Architecture and Other Writings,* translated by H.F. Mallgrave and W. Herrmann. Cambridge: Cambridge University Press.

Simitch, A and Warke, V. 2014. *The Language of Architecture: 26 Principles Every Architect Should Know*. Beverley, Massachusetts: Rockport Publishers.

Tally, R.T. 2013. *Spatiality.* London: Routledge.

Van Rensburg, R. 2003. *The Poetics of Light in the Modern*. Unpublished MArch Thesis. Pretoria: University of Pretoria. Retrieved from https://repository.up.ac.za/bitstream/handle/2263/24232/Complete.pdf?sequence=3 on 25 June 2019.

Vandenbulcke, B. 2011. *Concretion, Abstraction: The Place of Materials in architectural Design Processes. Case Study: Peter Zumthor*, retrieved from https://www.arcc-repository.org/index.php/repository/article/download/375/311/ on 11 July 2019.

Van der Ven, C. 1977. *Space in Architecture: The Evolution of a New Idea in the Theory and History of the Modern Movements.* Amsterdam: Von Gorcum.

Venturi, R. 1977. *Complexity and Contradiction in Architecture*. New York: The Museum of Modern Art.

Von Meiss, P. 1990. *Elements of Architecture. From Form to Place*. London: Spon Press.

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Tracing a "lost" Roberts and Cassells building through images in Bloemfontein

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This paper focuses on research using images of the demolished Chapel of the Church of the Latter-day Saints in Bloemfontein, South Africa. The building was built circa 1959 and demolished in 2013, and it is considered a unique example of Brazilian modernism in the Free State. The building was designed by the short-lived partnership between Ronald Roberts and Graeme Cooper (Peter) Cassells. The establishment of the architectural firm of Roberts and Cassells forms part of the research for this paper. The research not only exposes some surprising but relevant information relating to the history of the building, but also highlights the current loss of modernist buildings and their associated information. The evidence for this project was limited and challenges the truth about a specific building representing architectural modernism. The evidence consists only of images: the recreated drawings, remaining photographs, digital reconstructions, and a short video clip taken during the demolition. This investigation explores the efficacy of the photograph as evidence, the process of historical research, and the meaning of the loss of a previously unpublished building. The paper is set in a context where modernist buildings such as the Roberts and Cassells example tend not to be protected by legislation or lobby groups.
Keywords: Modernism, Bloemfontein, Roberts and Cassells, demolished building, South Africa, photography

Die opspoor van 'n "verlore" Roberts en Cassells-gebou deur beelde in Bloemfontein
Hierdie artikel handel oor die gebruik van beelde in navorsing oor die gesloopte kerk van the Church of the Latter Day saints, in Bloemfontein, Suid-Afrika. Die gebou is om en by in 1959 gebou en in 2013 gesloop, en kan beskou word as 'n unieke voorbeeld van die invloed van Brasiliaanse modernisme in die Vrystaat. Die gebou is ontwerp deur die kortstondige vennootskap van Ronald Roberts en Graeme Cooper (Peter) Cassells. Die ontstaan van die argitekspraktyk van Roberts en Cassells maak deel uit van die navorsing in hierdie artikel. Nie net stel die navorsing verrassende maar relevante inligting rakende die geskiedenis van die gebou ten toon nie, dit werp ook lig op die hedendaagse verlies van modernistiese geboue en hul geassosieerde inligting. Die bewysstukke vir hierdie projek was beperk en onthul die uitdagings daarvan om agter die waarheid te kom oor 'n spesifieke gebou wat modernisme verteenwoordig. Die bewysstukke bestaan slegs uit beelde: die herskepte tekeninge, oorblywende foto's, digitale rekonstruksies en 'n kort video-uittreksel wat tydens die sloping geneem is. Hierdie ondersoek handel oor die doeltreffendheid van die foto as bewysstuk, die proses van historiese navorsing en die betekenis van die verlies van 'n voorheen ongepubliseerde gebou. Die artikel is geskryf in 'n konteks waar modernistiese geboue soos die Roberts en Cassells-voorbeeld gewoonlik nie deur wetgewing of drukgroepe beskerm word nie.
Sleutelwoorde: Modernisme, Bloemfontein, Roberts and Cassells, beeld, Suid-Afrika, fotografie

The catalyst for this ongoing research project and this paper was the demolition of the Chapel of the Church of the latter-day saints in Bloemfontein, South Africa, in 2013. This building was designed by the short-lived partnership of Roberts and Cassells and forms part of an era of the architectural history of the city that, in many aspects, no longer exists. This paper traces two lines of discourse to address the loss of a significant example of mid twentieth-century design. The purpose here, however, is not to engage with the building in terms of its socio-cultural or architectural significance as such, but rather how the use of images has informed the research process. The interpretation of the images that remain of the lost building is foregrounded here. The benefit of and need for the accurate documentation of cultural history,

including architecture, has been established, especially in terms of monitoring change (Letellier 2007: 14). In the case under study, the documentation process was not systematic, and the discovery of images and other documents formed part of the research process.

The chapel had gone somewhat unnoticed outside architectural circles in the 2000s and 2010s. It was a remnant of a different urban fabric, that of the 1960s in Bloemfontein, and its scale was largely residential. In the last few years before its demolition, it was largely dwarfed by surrounding commercial developments. The value of the property, between the main roads of Nelson Mandela Avenue and Zastron Street on the southern edge of the centrally located neighbourhood of Westdene, added to its precarious position. It was sold to developers in 2008 (Verster 2013: 75) and, as economic pressures work, was eventually demolished in 2013.

The demolition and construction of buildings is part of the life of any city and contributes to the changing character and sense of place. The demolition of a building, however, serves as a marker in time, as photographs have also been described. Roland Barthes (1981: 76) has stated that "in Photography, I can never deny that *the thing has been there*. There is a superimposition here: of reality and of the past." The demolition of the chapel in this study was not marked as a significant event and was only captured by chance in a short video. This video marks that the building had existed and recorded the act of the demolition. In the use of a still from this video, not only is the moment superimposed as reality, but the image also serves as a marker in the life of a building and of the city, a thing that was there and contributed to the way it was seen and experienced.

This paper focuses on the unrecognised loss of this unique design, as well as on the role of the photograph and video stills as evidence and memory. The real, physically experienced building, can now only be understood in terms of the remembered or imagined building through photographs. I engage not only with the phenomenological approach of Maurice Merleau-Ponty (2004) and architectural theorists such as Juhani Pallasmaa (2005) and Sarah Robinson (2012) but also with the images that remain of the building as artefacts in themselves in reference to Gottfried Boehm (2009) Roland Barthes (1981), and Claire Zimmerman (2014).

Like the unique building they designed, the authors of this small chapel in Bloemfontein, Ron Roberts and Peter (GC) Cassels remain unknown, and unpublished, even within architectural circles, and the history of the partnership was only revealed after focused research as part of this project. Therefore, although not the focus of the paper, a component of understanding the building as an artefact and image is also to recognise its designers and the building as architectural history.

The chapel was a favourite modernist example for academics at the University of the Free State (UFS) Department of Architecture during the 2000s and student assignments had been set to reimagine the building with different functions during this time, as it was clear that in the commercialising context of Westdene it would struggle to continue to house a congregation. The building's future had by the 2000s become precarious after the Church of the Latter-Day Saints built a new chapel in the northern suburb of Heuwelsig. The chapel was sold in 2008 to the Georgiou trust and used under a lease agreement by the Church of the Prophecy of God between 2011 and 2012 (Verster 2013: 74) prior to its destruction.

Why does this small building, which was demolished with little more than a sigh, matter in terms of architectural history or theory, one may ask? The importance of many lesser known, smaller buildings are often only recognised once they no longer exist. The design of the chapel was an example of the influence of Brazilian modernism in central South Africa that has shaped many different aspects of the contemporary South African built environment. There are of course other larger, perhaps more significant, or well-known extant examples of this influence in Bloemfontein and other parts of the Free State. However, this small chapel revealed a unique decision in the design of the main arched space and as a small-scale building was valuable in terms of its composition. This quality was unfortunately not sufficient to save this example of unique design influences, skilful concrete use, and innovative typological approach, from demolition.

This building reveals a moment in the architectural history of Bloemfontein and now exists only in the recorded images and reconstructed drawings created from existing drawings and measurements prior to its demise. The image, therefore, takes precedence in the study of a building that no longer exists and that was not researched in depth during its existence as a physical artefact. Considering the loss of the existing, and the reliance on the image as a research record, this paper engages with the historical research on the building as an artefact, and reviews the images as visual works that both speak to the lost building and that also function as separate visual works in order to indicate the value of this lost structure.

Photographs as evidence

Initially, the focus of this study was only on historical research on the building as an artefact and historical record. The research methods were thus framed within Interpretive-historical research (Groat and Wang 2002). As the research continued, and the images were foregrounded as significant evidence, engagement with image interpretation, as discussed by Gottfried Boehm (2009), became an important methodological focus. The aspect of photographic architecture, as the dynamics between buildings and pictures, discussed by Zimmerman (2014: 6). The method, therefore, shifted towards the interpretation of the images, especially because the search for images was also rather serendipitous, with a lack of clear structure. Some were made with a clear plan by the author or other researchers, to record the building, but several earlier images were discovered almost by chance.

This is done in relation to and in comparison, to typical architectural phenomenological stances on the value of experiencing a building through the lens of, Merleau-Ponty (2004), Pallasmaa (2005) and Sarah Robinson (2021). Images and architecture and the links between these different systems of information have been discussed and form part of the historiography of architecture. Zimmerman (2014: 7) describes this interaction and often opposition between building and image as follows:

> In the history of architecture, the opposition between building and image that is so frequently part of our historiography complicates analysis. Nevertheless, it has become increasingly clear that buildings interact with other systems of information; they do not stand apart from them.

In this quote by Zimmerman, the fact that buildings do not stand apart as singular artefacts is highlighted. Buildings are designed and made by engaging with different systems of information. They are also represented, communicated, and recorded after demolition by using

these various systems, ranging from text and image to, more recently other virtual methods of representation. In this case, only the text and image systems remain. It may seem that only the physical building as artefact is relevant in a phenomenological sense. Merleau-Ponty's (2004: 63) stance on the integration between bodies and objects is relevant to buildings, often "clothed in human characteristics" because they are primary spatial objects designed for human experience. But this does not necessarily mean that a destroyed building no longer speaks to our embodied experience. Merleau-Ponty argues that a work of art cannot stand in place of the direct perceptual experience:

> Thus the work of art resembles the object of perception: its nature is to be seen or heard and no attempt to define or analyse it, however valuable that may be afterwards as a way of taking stock of this experience, can ever stand in place of the direct perceptual experience (Merleau-Ponty 2004: 95).

The direct perceptual experience of the building studied in this paper, whether at its inception or before its demise, is now impossible. Yet, the value of the photograph is highlighted in the sense that it allows one to "examine an object in its absence" (Merleau-Ponty 2004: 95). The phenomenology of photography itself, according to Petterson is founded on proximity and trace, both concepts that are significant in engaging with a building that no longer exists. "Photographs, thus, somehow have a unique capacity to, phenomenologically speaking, put us in the proximity of what they are photographs of" (Petterson 2011: 186). This quality of photographs that allows for the creation of proximity allows one to experience this building and other lost buildings through proximity. His following point, that photographs may also be understood as a trace, further builds the way in which to understand and engage with the chapel.

> Second, the notion of photographs as traces seems to explain part of the proximity associated with viewing photographs, for traces of the kind photographs belong to in general seem to have a capacity to evoke closeness, as when a depressed cushion evokes proximity to one's beloved, by virtue of being a trace of him. (Petterson 2011: 191).

This building is represented in photographs, that may in some sense evoke the same closeness if the empty space that it once occupied is seen as part of the trace that the photograph communicates. This is however not a critique of the embodied phenomenological approach of engaging with the real building, but rather a way to imagine and exercise the "emplaced care" (Auret 2020) for the lost building through the use of the remaining references to it as the physical space no longer exists.

The most recent and comprehensive traces that remain of this chapel in Bloemfontein are the set of available photographs taken in 2013. These images exist thanks to the efforts of lecturer Hein Raubenheimer and students at the University of the Free State after the chapel's impending demolition became apparent. The other remaining images are limited, taken by chance, or are copies and reproductions where original images could not be obtained. Zimmerman describes the role of representation and reproductions in many forms when buildings, both extant and demolished are investigated, referring to the varying systems available to the representation of buildings:

> Drawings, models, construction documents, photographs, forms, letters, textual accounts, and buildings themselves all provide information critical to historical interpretation, restoring to buildings some of their original valence. Zimmerman (2017: 447).

The lack of concrete available information links to what Zimmerman describes as the complexity, but also the value, of relying on photographic evidence in architecture:

> Buildings depicted on the surface of images were not to be found behind them, as depicted, on sites. Instead, the approximations that could be found differed substantially from their published image. That was one of photography's paradoxical purposes, in the age of the analogue photo- to make manifestoes out of sketches or prototypes and make buildings into objects of desire by depicting them (Zimmerman 2017: 447).

However, in the present study, the research process itself here is a process of discovery and reflection on building design and historic review. Because the chapel was not well documented before the 2000s, or during its inception, and has already been erased as a physical remnant, it opens up a process of discovery through "concoctions" (Zimmerman 2017). Of course, the primacy of the visual in architecture has been criticised in the past, especially by phenomenologists such as Pallasmaa (2005) in *The eyes of the skin*, and recently by Sarah Robinson in *Architecture is a Verb* (2021). The latter is in reference to a statement by Pallasmaa, who argues that space needs to be understood as lived, beyond basic geometry and measurability: "Consequently, basic architectural experiences have a verb form rather than being nouns"(2005: 63).

The questions then arise: is the proximity provided by photographs as traces, enough for architecture to be experienced if the physical space no longer exists? Can lost architecture be understood as lived spaces at all? Is the proximity provided through the photograph as trace also a verb in architectural experience? Perhaps not to the same extent, but it can function to evoke some experiential qualities for lost buildings. I rely on Boehm, to further justify the use of the image here: "So we are working with the premise that images add something important to our language, our concepts and our knowledge that can only be experienced through these images" (Boehm 2009: 226). Jenefer Robinson (2012) argues, similarly to Pallasmaa in the *Eyes of the Skin* (2005) for the necessity to experience a building through movement, as a critique of the "ocularcentrism" in architecture and architectural theory:

> Of course, he [Pallasmaa] is not denying that one needs to look at a building in order to appreciate it. Rather, he is denigrating buildings that seem to be designed primarily to be seen rather than occupied, buildings that are aesthetically rewarding only when experienced visually rather than with the whole body as one moves through a building. Modernist architects and architectural theorists all tend to privilege the visual (J. Robinson 2012: 337).

However, there is more to the image of a building than the aesthetic experience that is seemingly favoured by modernist architects as described above. The proximity offered by the photograph may offer a sense of interaction not only as traces but as mediators. Where the building no longer exists the image may be the only remaining experience: "Photographs of buildings are photographs of built representations – which means that we might understand them as mediated images that mediate yet other sorts of images" (Zimmerman 2014: 8).

The chapel that forms the basis of this study may also have had an experiential quality beyond the visual that is impossible to study now, but it may be argued that in its simplicity and understated design, with an element of sculptural South American influences, did not fall into the trap of the ocularcentrism of modernists elsewhere: "The story of modern architecture is in part the story of confusion between different orders of representation— between the built image and the photographic image of that construction" (Zimmerman 2014: 8).

Following Zimmerman, it may be seen in the example of the chapel, as with other modernist examples with these influences, that the design is not solely ocularcentric. It speaks of movement within the images and resides within the ambiguous space of modernist architecture that existed but is now only represented in photographs. Is this a complete building?

Jenefer Robinson (2012: 339) refers to the earlier work of Roger Scruton (1979: 206) *The Aesthetics of Architecture*, where he states: "To take an aesthetic interest in a building is to attend to it in all its completeness, to see it, not in terms of narrow predetermined functions, but in terms of every visual significance that it will bear." Interestingly, the visual significance is mentioned here, suggesting how a building might become recognisable or even iconic. It may have seemingly been possible for the chapel in Bloemfontein, but unlike similar designs, this building seemed to have little visual significance for the local public. The visual significance is therefore only recognised through the visual medium of photography, even though phenomenologists in architecture have been careful of the role of the photograph as a reduction of architecture to mere information. "Images were staged as new kinds of focused architectural experiences meant to stimulate the senses and captivate attention" (Otero-Pailos 2015).

Jenefer Robinson (2012) emphasises that Scruton is more concerned with the visual appearance of materials, and spatial arrangement than with the actual movement through the building. However, the idea of attending to a building in all its completeness is also significant, even when the "complete" building no longer exists. This work may well have had the qualities that Auret (2020: 173) ascribes to works that "dignify" emplaced care. Recognisable architectural works, thus reside in our memory and call us to experience them. The chapel is no longer "complete" neither as a building to be experienced – since Pallasmaa and Jenefer Robinson argue a building should be engaged with, it can also no longer serve as "the building that will call you to follow the same route again tomorrow", as Auret (2020) describes the memorable quality of a beautiful building – nor is it complete as merely a visual work. There are specific photographs of specific moments within the timeline of the building, but these are, as with all photography, only a selection of a specific moment in time.

> Works of architecture have the capacity to dignify our emplaced care, which is why "the beautiful building is the one that would make me follow the same route again tomorrow". For the first step towards making beauty is noticing beauty, and then letting the intensity of its call shape the way we live (Auret 2020: 173).

Yet, if a building is destroyed in the way that the chapel has, some dignity has been lost or forgotten. There is value in recognising the buildings that constitute the lived reality of a city, but to recognise or reaffirm emplaced care, the photograph as trace may be the only entry point. The imagined thus steps in and becomes as necessary as the real:

> It seems to us that there is a value for architects in the pastness of the past, and that there is a kind of aesthetic of the history of places in photographs, which is not exhausted by their evidential role, nor in the moral lesson which they give us of the profligate treatment of built culture. It is commonplace now to disapprove of 'nostalgia' and connect it with the urge to recreate past environments as dioramas into which can step, a practice which ultimately devalues the persistence of real materials from the past. Yet the photograph actually requires us to play such games of projection, in which the real and the imagined are equally necessary (Lambie and MacArthur 1996: 53).

I do not argue in opposition to Merleau-Ponty, Pallasmaa, Sarah Robinson, and other phenomenologists. I agree and would argue that a building is a physical artefact that requires interaction with the real sensorial work, and many interactions over time. However, in cases

where buildings have been demolished (or perhaps altered beyond recognition), there is care in engaging with the visual remnants: "Care draws lived reality near. Spatially, this way of approaching reality implies that people do not inhabit spaces, but places….While the concept of place, as a concrete lived reality, point [*sic*] toward that which is nearest, it is care that draws life and place into nearness" (Auret 2016: 194) To review that which was nearest, which undeniably there (Barthes 1981) but now only resides in the imagination, is to engage with the changing nature of place.

The Chapel

Because the building discussed here no longer exists and the site has been redeveloped, the concept of the palimpsest may come to mind. John Stilgoe (1998: 6) describes the built environment as a palimpsest, "… a document in which one layer of writing has been scraped off, and another one applied." In this case, as with many other documents in the built environment, the layer of writing has been scraped off almost entirely and the new writing is quite bold. Therefore, again to quote Stilgoe (1998: 6): "An acute, mindful explorer who holds up the palimpsest to the light sees something of the earlier message, and a careful, confident explorer of the built environment soon sees all sorts of traces of past generations." The exploration of the chapel site has been slow, and the traces are often difficult to see.

This study is partially an attempt to discover these traces and reveal the context of the previous layer of text, an attempt to reveal a building that was erased with indifference, and to record it as it is represented in images. When researching buildings, the notion of the palimpsest has often, and perhaps to the point of cliché, featured as a metaphor for the process. But the research here is also a process of imagining and of dealing with indeterminacy, so has therefore rather engaged with the concepts of trace and proximity. To enact care through images, the place, that is therefore the context of this building through time, is relevant.

The Park West and Westdene area in Bloemfontein has seen significant changes in the fabric and character of its built environment, especially in the last two decades (Roodt and Steÿn 1996, Hoogendoorn and Visser 2007; Auret 2016; Marais 2021). in this case the "loss" of the building was not driven by anything more than typical commercial elements, so the process of demolition was not recorded in a journalistic or historical sense, as other sites of more valuable "lost" buildings are often recorded. Still, images have been the keys to this exploration, and I have selected seven photographs made during the "life" of this building to signpost the discussion.

The drawings obtained from the Mangaung Metropolitan Municipality by B Arch Hons students at the UFS (sometime in the 2000s) and then photocopied, indicated a date of 1956[1] and the name of the practice. This was the first step in finding the architects and establishing the history of the building and its authors. Starting from this date, it follows that the chapel was built sometime after 1956.

Like many contributors to the built environment of Bloemfontein in the late 1950s and 1960s, both Ronald (Ron) Roberts (1923-2007) (figure 3) and Graeme Cooper (Peter) Cassells (figure 1) (1919-1955) were the sons of immigrants and trained at the newly formed University

[1] Subsequent visits to obtain drawings from the municipality have not been successful.

of Pretoria school of architecture[2], during the early days of its program[3] (Cassells 2020), before coming to the Free State to make their architectural mark. Roberts was a little younger than Cassells and would presumably have completed his studies a few later. It is not a surprise that these young architects who received their training at the new architectural school, would be searching for new idioms within architectural design and were influenced by modernist trends.

Figure 1
Graeme Cooper (Peter) Cassells (1919 -1955) Unknown Photographer (ca 1940)
(source: courtesy of Cassells 2020).

Although their influence as individuals is now scarcely visible in Bloemfontein, these two architects brought a modernist architectural language, that was later built on and expanded by architects such as Henk de Bie (Peters and Raubenheimer 2019: 38) and his contemporaries. Peters and Raubenheimer mention that little of note occurred in Bloemfontein in the late 1950s. This further indicates that the chapel in Zastron Street received almost no notice, even though it is rather sculptural and shows evidence of skill in design and construction like the Public Library of 1957 designed by JJ van Voorst, [4] and the Civic theatre of 1958, designed by Manfred Herner. It was of course of a smaller scale but designed and built at a time when the public projects started to show the new influences in architectural circles. Furthermore, it, fits within the larger idiom of Brazilian-influenced modernism evident throughout South Africa, forming part of a search for "a new architectural identity" (Barker 2017). This search was motivated by not only various reactions to the status quo of Modern Movement canon, "but also technological failures, poor climatic responses, the establishment of new local industries and the inauguration of the new Nationalist party government in 1948" (Barker 2017: 18). The second-wave modernism had a significant following in Pretoria and surrounds: "Spreading in the fifties and sixties from Pretoria to other parts of the country, the Brazilian-inspired regionalism was a crucial contribution to our cultural patrimony" (Gerneke 1998: 197) This movement was, as described

[2] The degrees were initially taught in collaboration and conferred by the university of the Witwatersrand up to the point that UP became an independent institution. (https://www.up.ac.za/architecture/article/1915700/history-of-the-school)

[3] Cassells, G. 2020. *Information about GC (Peter) Cassells, with his son, G. Cassells*. Email communication to W. Odendaal on 11-23 September 2020.

[4] No Author. 1959. Public library, Bloemfontein. In *Architect and Builder. October*. Pages: 36-39 (available through the University of the Free State)

by Tomer (2016: 231), "an approach to architecture concerned with the 'local' in regards to both what was possible to produce and as a generator of formal expression."

It follows that Bloemfontein would soon be in step with the search for a new architectural identity. With young architects moving to the Free State with their training in Pretoria fresh in their minds, the designs would soon speak the same language. Bloemfontein provided the unlikely site of a collaboration that prove the skills of this single-project partnership. An English-speaking client from the United States, needed architects who could interpret their brief for a chapel in, at the time a small city in the heart of the country now under the rule of the National Party, and they found their architect in Peter (GC) Cassels.

The design for the chapel is strikingly similar to the church of St Francis of Assisi, Pampulha, Belo Horizonte built in 1943 by Oscar Niemeyer,[5] again showing the South American influence (Allen 2016). The Bloemfontein chapel resembles the Belo Horizonte church building in the design of the vaulted spaces. "The concrete barrel vaults are the main structural elements that draw one's attention. In this case the free-standing tower is absent, and a small spire is integrated into the structure" (Verster 2013: 75). There is only a single main barrel vault present here, and the remaining space is covered with an undulating roof rather than further vaults (compare figure 2 and figure 8).

Figure 2
Oscar Niemeyer, Church of St Francis of Assisi, Belo Horizonte.
(retrieved from the public domain https://www.flickr.com/photos/ludmila_tavares/1340879541/).

It is within this context of the modern movement, a changing political climate in South Africa, and a small mainly Afrikaans city, that Roberts and Cassells entered a partnership to complete the chapel. It is unclear exactly when this was done, but Cassells was aware of a cancer diagnosis and quite ill by the time that the commission was on his drawing board. As mentioned in an interview by Felicity Roberts[6] "…I think that Cassells went to Ron and said 'Look, I need a partner because this is my problem. I am terminal and I need the practice to go on. And there

[5] E-architect. 2019. Pampulha Church in Belo Horizonte: Modern architectural restoration project in Brazil – 20th century design by Oscar Niemeyer Architect. Retrieved from https://www.e-architect.com/brazil/pampulha-church-in-belo-horizonte on 30 April 2021.

[6] *Interview about Ron Roberts*, with F. Roberts by W. Odendaal, 1 November 2020. Roberts, F. 2020. *Ron Roberts life and partnership.* [Interview (recorded and transcribed). Stilbaai, South Africa. 30 November 2020.

are certain projects that we have on the board.'" A recognition of one's mortality at a relatively young age, and a last commission to complete may have led to a more daring approach for a final design.

Figure 3
Ron Roberts (1923-2007) Caricature by d'Ory
(source: *Architect and Builder, July* 1959: 71).

To remember this building is also to go in search of its authors and the instances of the changing urban environment of Bloemfontein. "Memories, by turns found and sought, are therefore situated at the crossroads of semantics and pragmatics. To remember is to have a memory or to set off in search of a memory" (Ricoeur 2004: 4).

The partnership only existed for this project – a last chance for a dying man to complete a design for a building that now also no longer exists as a physical artefact. The series of images of the building and this paper are the result of a partnership formed for a single lost building. I could find no sketches or earlier drawings of this project.[7] I discuss the selected images that were used to engage with this building in the following section.

The images

This section is a retracing of the steps of the building's existence through the traces (the photographs), that remain of the structure. The earliest image that could be obtained for this paper was found in an article in *Ensign*, a publication of the Church of the Latter-day Saints, which includes a reference to the chapel in 1973. That is why I start the exploration here a few decades after the construction of the chapel and rely on a series of photographs and similar images, rather than on the reconstructed drawings. The image in the use of historical research and our engagement with the past is emphasised in the following statement by Ricoeur:

> …the presence in which the representation of the past seems to consist does indeed appear to be that of an image. We say interchangeably that we represent a past event to ourselves or that we have an image of it, an image that can be either quasi visual or auditory (Ricoeur 2004: 5).

The image developed for the representation of the past, in this case, came through the research process and the viewing of each of the selected photographs in this short series.

[7] Some of Cassells' earlier drawings survive, but all of Roberts's were lost due to, of all things, a burst geyser.

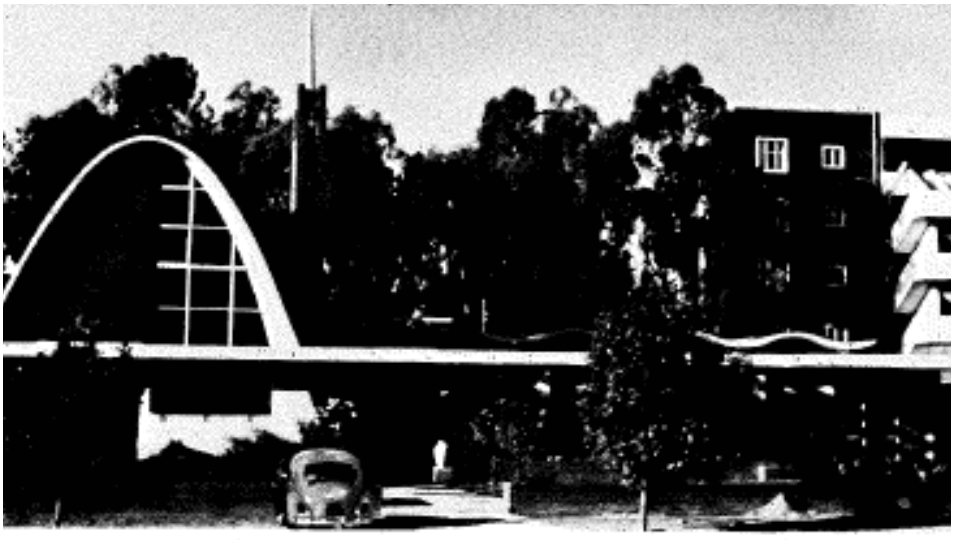

Figure 4
Photocopied Photograph circa 1973 showing the South façade
(source: : Cummins 1973: 8, unknown photographer).

In this low-quality reproduction (figure 4), the building and its surrounding context are represented as a reduction of light and shadow. The modernist arch and spire of the chapel are clear, although more as a silhouette than as an accurate depiction. This reduces the building to its most typically modernist features and may draw this design back into the accusations of occularcentrism associated with this movement. Most of the image is obscured by the shaded silhouettes of trees. The Volkswagen beetle in the foreground serves as a reference point to determine the time and context of the image. The apartment block (Smutsdene) to the east is recognisable as an additional evidentiary trace. Interestingly, there seem to be large windows in the southern façade of the arched space that are not present in the more recent images (figure 8). Much as memory fades and becomes distorted and reduced, the image of the building merely 14 years after its construction is also unclear, incomplete and distorted. This image is of course no Cezanne, and Boehm's (2009) analysis regarding the logic of images refers to artistic works such as painting, rather than photocopied printed photographs. However, the imaginary does start to play a role here. An unclear, even opaque image that has traces of the real object of the building does have layers, and it may be said that the "factual is transformed into the imaginary, and a surplus of meaning results that allows mere material to appear as a meaningful view" (Boehm 2009: 228).

Although meaningful, this image does not reveal much of the context of 1970s Bloemfontein. Minimal physical development occurred in Westdene between 1950 and 1970 as most of the lots had been occupied (Hoogendoorn and Visser 2007: 334). A decade or so would pass before the next image was taken. With some luck, it reveals the chapel in its larger context.

A 1985 aerial photograph by Charles Corbett shows the context of a developing city. The Free State rugby and athletics stadium and Loch Logan waterfront are prominent in the foreground. The recently completed Sand du Plessis Theatre and Fidel Castro (then CR Swart) Buildings are the largest structures visible toward the right of the image. The neighbourhood of Westdene is seen toward the top of the image with the residential scale notable. Third Avenue cuts vertically across the right of the image with Second avenue forming the second artery

toward the left. This area is typified by the developments of the 1970s and the Westward shift of institutions toward Markgraaff street (just out of frame). (Hoogendoorn and Visser 2007: 334; Auret 2016:207) It must be said that the interpretation of this image assumes a familiarity of place with the city of Bloemfontein and the changes that occurred to the built context here over the last thirty years. The phenomenological cannot be distanced in understanding the place of this building as it changes over time. So, in comparing a lived experience of the changing city with the static image, the photograph may again become "indeterminate". With a lack of familiarity with the reality of the city, the birds-eye view and passage of time further distances the viewer, and the imaginary is then foregrounded.

Figure 5
Charles Corbett. 1985. Free state Rugby Stadium and Loch Logan. Note the residential context and the location of the chapel in the upper left corner
(photograph by Charles Corbett).

The image requires further scrutiny to reveal the chapel that is the key role player in this research, a careful search within either a known context or a specific iconography if the context is unknown. Therefore, in this next image, by cropping and zooming the image provided by Corbett, the recognisable profile of the chapel roof could be identified more clearly. From the small building visible in the left corner of the original photograph, in the zoomed image the vaulted space is an out-of-focus object, but still recognisable.

Figure 6
Detail with chapel indicated adapted image from Corbett, C. 1985
(photograph by the author 2022).

The next available image, in the chronological process of engaging with this building, is one provided by the Church of the Latter-Day Saints dating from 2000 (figure 7). Again, several decades intercede and in this case, vast socio-political changes had taken place throughout the 1990s. Westdene at this time was undergoing rapid change, including the development of the Southern parts with new blocks of flats (Hoogendoorn and Visser 2007: 334).

Figure 7
May 2000 toward the Firmitas Building.
(Unknown photographer. Supplied by CDL Heuwelsig).

In this image of slightly better-quality (figure 7), the Chapel is now more clearly visible in the centre of the image. The curved profile of the barrel vault and the spire are prominent. Two women are walking along a well-trodden path across the lawn of the sidewalk. The Firmitas

building[8] by Jan Ras Argiteksgroep in 1996, is visible in the background. The vaulted main space is prominent. The glazing visible in the earlier image must have been bricked up in the intervening two or three decades and white painted brick now completes the facade. A low fence with a residential quality marks the edges of the chapel property.

Figure 8
Roberts and Cassells ca 1959. The Chapel of the CLDS as viewed from Zastron Street (photograph by JL Du Preez, 2005).

Between the image above and this photograph of the Southern Elevation of the building, by local architect and lecturer Kobus du Preez, not much seems to have changed. The image reveals much of the design and aspects of the context, of the area as it was in 2005, but it is not dissimilar to the 2000s and perhaps 1990s. The photo is framed from the busy main route of Nelson Mandela Avenue, but the setting seems to be much more residential. It is only the glimpse of larger buildings on the edges of the image that reveals a denser more urban context. The Firmitas building, is visible toward the west, and the now also demolished apartment block toward the east. The chapel itself has a residential scale and setting, and a footpath leads to the entrance through a small gate in a low green fence, complete with a small free-standing post box to the side. A well-kept suburban lawn completes the boundary of the site before it reaches the concrete sidewalk next to the road. The detail on the windows and doors is visible, as are the distinct arch of the main space and the waved curves toward the remaining space. The next image is one of the clearest not taken in the last years leading up to the demolition of the building. Figure 9 provides a view of the northern elevation about eight years after the image by du Preez. The similarity to the Oscar Niemeyer church (figure 2) is most directly visible here.

[8] The building housed UNISA offices in the past, and currently EduVos.

Figure 9
Northern façade 2013
(photograph by the author).

The chapel was photographed most comprehensively before its demolition in 2013, by students at the UFS Department of Architecture. For this study, however, only specific images have been selected. The demolition was reported in the *Bloemfontein Courant* (Kock 2013) but the destruction elicited little response. During the research process, local architect Hennie Lampbrechts took an image and video of the demolition of the building. This visual evidence was itself the product of chance. Lampbrechts only happened to pass the demolition site at the time of the final destruction[9] and was able to record the short video and a few images (figure 7).

Figure 10
Roberts and Cassells ca 1959. The Chapel of the CLDS as viewed from Zastron Street during demolition.
(photo: H. Lamprechts, August 2013).

[9] The demolition took place during the last weeks of August 2013, coincidentally and perhaps ironically during the same time that the UFS Architecture Department's prestigious Sophia Gray memorial lecture took place, with laureate Kate Otten.

In this figure, as before, the green lawn of the sidewalk and the low fence are foregrounded. This photograph is not a striking image or a significant work. It is not composed with any particular intention other than recording the moment of destruction, yet it has value beyond having recorded this particular moment, in that it also provides proximity. The destructive act of the building's demolition is centred in the frame, with the construction worker resting on the low wall of the perimeter fence, as the outstretched arm of the concrete breaker takes aim at the remainder of the central arched structure. In this image, the duality of the residential, suburban quality and the half-destroyed building are drawn together in the casual viewer seated as if the demolition itself is a rather mundane form of entertainment.

Indifference to a trace of the modernist and apartheid urban landscape is perhaps apt, but as (Landman and Makakavule 2021: 545) suggest urban landscapes may benefit from remembering, re-imagining and transforming. In contrast, this site was unrecognised, forgotten and replaced by the cliché of a parking lot for a bank (figure 11).

Figure 11
2022 The Site on Nelson Mandela Avenue shows the parking lot that replaced the chapel (photograph by the author).

In this final image of the timeline of this site, I attempted to replicate in 2022 the point of view of du Preez from 2005. The only physical remnants of the previous building can be seen in the difference in paving material, the red brick perimeter walls, and the garbage-covered steps. The trees on the sidewalk and the Firmitas building to the west indicate the remaining similarities to the 2005 photograph. The residential fence has been replaced with the ubiquitous devil's fork palisade fencing, (beloved by commercial developers and residential property owners alike) and the rest of the site has been levelled, scraped clean of trees and covered in shade netting to protect cars from the harsh Free State sun. This image, the final in this series of snapshots, requires the greatest effort of imagination and is perhaps the furthest removed from the chapel. Has the sense of place here remained? Probably not, nor has it been renewed. This building, which had long gone very much unnoticed, suffered the fate as described by Auret (2016: 209), as first

being strangled and then demolished, only to be replaced by an utterly backwards-looking urban solution. That solution is not one where re-imagining, transforming, or renewing has been given a chance, or where the trace of the original has been given thought.

Conclusion

The appearance and vanishing of a building can be recounted through images. In the case of this modernist chapel, the process was presented chronologically, from the earliest available images to the video stills of its destruction and a final image of a redeveloped site. It was an attempt not to restore, but to view this section of the city with a sense of care. I rely on Barthes (1981) to reveal the role of the photograph in this view of the chronology of a specific building and urban context:

"The photograph does not call up the past…. The effect it produces upon me is not to restore what has been abolished (by time, by distance) but to attest that what I see has indeed existed" (Barthes 1981: 82). The chronological series of images form a series of instances on a timeline within the changing urban context of a city, to attest that this small building did in fact exist and it provided some value in a changing lived space of Bloemfontein.

Acknowledgement

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Works cited

Allen, E. 2016. Sixteen examples of stunning modern architecture by Oscar Niemeyer, *Architectural Digest*. Retrieved from https://www.architecturaldigest.com/gallery/stunning-modern-architecture-oscar-niemeyer on 30 April 2021.

Auret, Hendrik A. 2016. Bloemfontein (1848-2015): Mapping eight moments in time: measuring and appreciating that which is nearest, *New Contree* 76 (supplement) November: 193-212.

Auret, Hendrik A. 2020. The responsibility of architecture: Beauty, justice and the call of care, *Acta Theologica* Suppl 29: 152-72. Retrieved from https://doi.org/10.18820/23099089/actat.Sup29.9.

Barker, Arthur. 2017. Modern movement mediations: Brazilian modernism and the identity of post-war architecture in Pretoria, South Africa, *Paranoá: Cadernos de Arquitetura e Urbanismo* 18(18) August. Retrieved from https://doi.org/10.18830/issn.1679-0944.n18.2017.04.

Barthes, Roland. 1981. *Camera Lucida: Reflections on Photography.* New York: Hill and Wang.

Boehm, Gottfried. 2009. Indeterminacy: On the logic of the image, in *Dynamics and Performativity of Imagination: The Image between the Visible and the Invisible,* edited by Bernd Huppauf and

Christoph Wulf. New York: Routledge: 384.

Cummins, Lawrence E. 1973. *The Saints in South Africa*. Retrieved from https://www.churchofjesuschrist.org/study/ensign/1973/03/the-saints-in-south-africa?lang=eng on 5 August 2021.

Gerneke, Gus. 1998. From Brazil to Pretoria: The second wave of the modern movement, in *Architecture of the Transvaal*, edited by R.C. Fisher, S. le Roux and E. Maré. Pretoria: University of South Africa: 196–229.

Groat, Linda. and Wang, David. 2002. *Architectural Research Methods*. New York: John Wiley and Sons.

Hoogendoorn, Gijsbert. and Visser, Gustav. 2007. The evolving South African neighbourhood: The case of Westdene Bloemfontein, *Urban Forum* 18(4): 329-49. Retrieved from https://link.springer.com/article/10.1007/s12132-007-9017-2.

Kock, Owen. 2013. Demolishing of buildings in Bloemfontein. *Bloemfontein Courant* July 26. Retrieved from https://www.bloemfonteincourant.co.za/demolishing-of-buildings-in-bloemfontein/ on 21 July 2022.

Lambie, Lisa. and MacArthur, John. 1996. Grasping the intangible: Some thoughts on a photograph of demolished buildings, *Architectural Theory Review* 1(2): 53-9.

Landman, Karina. and Makakavhule, Kundani. 2021. Decolonizing public space in South Africa: From conceptualization to actualization, *Journal of Urban Design* 26(5): 541–55. Retrieved from 10.1080/13574809.2021.1880885.

Marais, Lochner. 2021. Bloemfontein: Three decades of urban change, in *South African Urban Change Three Decades After Apartheid: Homes Still Apart?*, edited by Anthony Lemon, Ronnie Donaldson and Gustav Visser. Edinburgh: Springer: 117-27.

Merleau-Ponty, Maurice. 2004. *The World of Perception*, translated by Oliver Davis. London: Routledge.

Otero-Pailos, Jorge. 2010. Epilogue: After architectural phenomenology, in *Architecture's Historical Turn: Phenomenology and the Rise of the Postmodern,* edited by J. Otero-Pailos Minneapolis, MN: University of Minnesota Press: 251-62. Retrieved from https://doi.org/10.5749/minnesota/9780816666034.003.0006 on 5 August 2022.

Pallasmaa, Juhani. 2005. *The Eyes of the Skin*. Chichester: Wiley.

Peters, Walter H. and Raubenheimer, Hein. 2019. The architecture of Henk de Bie and Van Wijngaarden in Bloemfontein of the 1960s: Rooted in purpose, time and place, *Architecture SA* 95: 38-48.

Petterson, Mikael. 2011. Depictive traces: On the phenomenology of photography, *The Journal of Aesthetics and Art Criticism* 69(2): 185-96.

Ricoeur, Paul. 2004. *Memory, History, Forgetting,* translated by Kathleen Blamey and David Pellauer. Chicago: University of Chicago Press.

Robinson, Jenefer. 2012. On being moved by architecture, *The Journal of Aesthetics and Art Criticism* 70(4): 337-53.

Robinson, Sarah. 2021. *Architecture is a Verb.* Routledge: New York.

Roodt, Anton. and Steÿn, Das. 1996. The transformation of social space in the neighbourhood: Aspects of a case study:

Westdene, Bloemfontein, *Town and Regional Planning* 41: 19-30. Retrieved from: https://journals.ufs.ac.za/index.php/trp/article/view/2466 on 2 August 2022.

Scruton, Roger. 1979. *The Aesthetics of Architecture.* London: Methuen.

Stilgoe, John R. 1998. *Outside Lies Magic: Regaining History and Awareness in Everyday Places.* New York: Walker.

Tomer, Sharone. 2016. *'After' Modernism: Architectural Articulations of Apartheid's End in Cape Town*. Unpublished PhD thesis. Berkley, CA: University of California. Retrieved from: https://escholarship.org/uc/item/60t1t0sk on 8 November 2022.

Verster, Wanda. 2013. *A Study of the Life-cycle, Re-use and Adaptation of Places of Worshop in Bloemfontein from 1948 to the Present, with Specifc Reference to the Afrikaans Reformed Churches.* Unpublished M Arch dissertation. Bloemfontein: University of the Free State.

Zimmerman, Claire. 2014. *Photographic Architecture in the Twentieth Century.* Minneapolis, MN: University of Minnesota Press.

Zimmerman, Claire. 2017. Reading the (photographic) evidence, *Journal of the Society of Architectural Historians* 76(4): 446-48.

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What contemporary practicing architects buy to read: a global overview

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An increasing focus on the cultural and social dimensions of architecture in scholarly literature prompted the question: What do contemporary architects actually buy to read, particularly those in practice? To answer the question, the writer analysed the 56 bestsellers in books on architecture on Amazon.com. Amazon is by far the biggest bookseller in the world. The study provides evidence that the fields of knowledge they rely on to be able to do their work is still aligned with the Vitruvian principles of *firmitas*, *utilitas*, and *venustas* (durability, convenience, and beauty).
Keywords: Amazon.com, architecture books, architectural knowledge, Vitruvian principles

Wat lees hedendaagse argitekte?
'n Toenemende fokus op die kulturele en sosiale dimensies van argitektuur in wetenskaplike literatuur, het die vraag uitgelok: Wat lees hedendaagse argitekte eintlik, veral dié in die praktyk? Om die vraag te beantwoord, het die skrywer 56 topverkopers in lys van boeke oor argitektuur by Amazon.com ontleed. Amazon is by verre die grootste boekeverkoper in die wêreld. Die studie bied bewyse dat die kennisvelde waarop hulle staatmaak om hul werk te kan doen, steeds strook met die Vitruviaanse beginsels van *firmitas*, *utilitas*, en *venustas* (duursaamheid, gerief en skoonheid).
Sleutelwoorde: Amazon.com, argitektuurboeke, argitektoniese kennis, Vitruviaanse beginsels

Ida Engholm of the Royal Danish Academy of Fine Arts, Schools of Architecture, Design and Conservation, investigated the changing emphasis in historical research in great depth in a 2011 paper titled *Positions in contemporary design research*. She found that the study of the history of architecture is expanding from the realm of art to social and cultural history (Engholm 2011: 51). Subsequently, while writing an article on the relationship between culture and architecture, I surveyed a substantial amount of literature on the social dimension of architecture, as well as on related issues, such as spatiality, context, regionalism and designing for people. These themes feature prominently in academic publications, but are rarely discussed among practising architects, which prompted the question: are practising architects globally interested in them? What are their reading and buying habits.

Architecture is commonly described as "the art and technique of designing and building, as distinguished from the skills associated with construction" (Collins *et al.* 2021).[1] Unlike (say) statuary, a building must not only be attractive (a relative notion), but also be appropriate for its intended function and use.

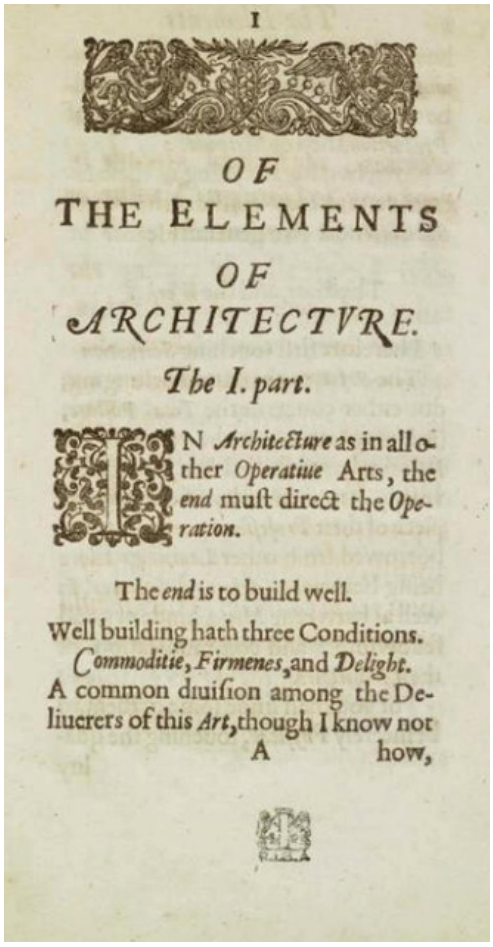
The Roman architect and engineer, Marcus Vitruvius Pollio (first century BCE), generally known as Vitruvius, defines the essential requirements of good architecture as *firmitas*, *utilitas*, and *venustas*. This so-called often referred to as "durability, convenience, and beauty" as translated in the classic English language version which is still in print (Vitruvius and Morgan 1960: 17).[2] Collins *et al.* (2021) articulate these as "structural stability, appropriate spatial

[1] Some sources define architecture as the art and science of designing buildings and structures.

[2] Marcus Vitruvius Pollio (c. 90 – c. 20 BCE), known as Vitruvius, was a Roman military engineer and architect who wrote the first known treatise on construction, titled *De Architectura* (On Architecture), in circa 27 BCE.

accommodation, and attractive appearance", noting that different authors, such as Leon Battista Alberti (1404–1472), Andrea Palladio (1508–1580), Étienne-Louis Boullée (1728–1799) and Jean-Nicolas-Louis Durand (1760–1834), have offered different sequences over the ages. Sir Henry Wotton's seminal book, titled *The Elements of Architecture* (1624), retains Vitruvius' sequence (figure 1). Nevertheless, they imply that durability and convenience are "essential logical prerequisites of architectural beauty" (Collins *et al.* 2021). However, the concept of "beauty" in this context must be viewed with circumspection. Le Corbusier 1931: 95) writes of "beauty in the sense of good proportion". Estelle Alma Maré (2017: 60), in an article entitled "Fear and pleasure aroused by built environments", does not use the term "beauty" at all, but claims that successful architecture gives pleasure in a qualitative sense.

Considering the Vitruvian perspective, this study aims at determining what architects read. It does not differentiate between actually reading a narrative, looking at images, or consulting for information. It is not a review of the literature, but rather an investigation into the nature of knowledge that practising contemporary architects rely on in order to do their work well. In that sense, the article relates to *What Designers Know* by Bryan Lawson (2004). Only books, rather than articles, are considered. After all, as Richard Dawkins (2021: 176) suggests, book-length publications tend to be more influential than brief articles. These inevitably include books that architects may have in their own reference libraries, as well as textbooks bought as students.


1

OF
THE ELEMENTS
OF
ARCHITECTVRE.

The I. part.

IN *Architecture* as in all other *Operatiue* Arts, the *end* must direct the *Operation*.

The *end* is to build well.

Well building hath three Conditions. *Commoditie*, *Firmenes*, and *Delight*.

A common diuision among the Deliuerers of this *Art*, though I know not

A how,

Figure 1
First page of *The Elements of Architecture* (Wotton 1624).

Sources and method of analysis

The data were collected from Amazon.com – unquestionably the largest online bookstore in the world – in mid-2020, by listing the first 65 bestselling books on architecture. Andy Hunter (2021), founder and CEO of Bookshop.org, estimates that Amazon.com had a market share of approximately 54% when this study was done (figure 2). Since 10% is widely considered to be a good sample size for statistical analysis, Amazon's data is sufficiently representative.

Figure 2
Amazon's share of the book market
(source: Hunter 2021).

Amazon's fine-grained classification and ranking of topics are helpful. Although the rankings are inevitably in a state of flux, they have remained relatively constant over the past two years. As an example, *A Pattern Language* (Alexander *et al*. 1977) was Amazon's bestseller in Architectural Criticism on 5 June 2020, and still was on 30 July 2022 (figure 3).

Figure 3
Bestsellers Rank
(screenshot on 5 June 2020).

Amazon's classification of titles seems arbitrary at times.[3] Not everybody would agree that the number 2 bestseller in Architectural Criticism, namely *Architecture: Form, Space, & Order* (Ching 2014), and the number 3 bestseller, namely *The Poetics of Space* (Bachelard 1958/1994), belong in that category. As an academic, researcher, architect and active participant in the local institute of architecture, I am constantly engaging with the prevailing areas of concern. For this survey of the literature, I identified the following broad streams, namely architectural history, architectural precedent, architectural theory, building construction, design norms, practice guidelines, regionalism, and sustainable design. Since architects' responsibilities are basically the same worldwide, it is assumed that the reading preferences of South African architects are similar to those of their peers globally. The process starts with a concept and design development, which must consider the parameters and constraints impacting on the project; relevant user requirements, climatic and environmental conditions, the physical and socio-economic contexts, legal guidelines and budgetary ceilings.

Amazon's official bestselling book in the field (*Architectural Digest at 100* edited by Amy Astley 2019) was eliminated as it was also number 1 in Architectural Photography and number 2 in Photography. The runner-up, namely *Structures: Or Why Things Don't Fall Down* (Gordon 2003), was also number 1 in Architectural Materials, Structural Engineering and Civil Engineering. As their readership is much larger than merely the architectural fraternity, all interior design books, as well as all structural books that seemed too technical for architects, were removed from the list. It resulted in a list of 56 books, with number 56 being *Transcultural Architecture* (Botz-Bornstein 2015); one of the important sources in my previous research.

Results

An earlier analysis to determine the prevalence of references to intangible architectural characteristics served as a steppingstone (Appendix A from Steyn 2021). The 12 books then analysed were randomly selected to represent a range from the purely descriptive (*Architecture Now*, Jodidio 2015) to the philosophical (*The production of Space*, Lefebvre 1974/1991). The ranking of these 12 books were subsequently compared to that of Amazon's bestselling books on architecture. Since mapping was concluded with a book titled *Transcultural Architecture* (Botz-Bornstein 2015), it is not a coincidence that the first and last books in the list were cited in the earlier article. The analysis was based on the list of 56 books, but a shorter list, deliberately cut off at *The Production of Space* for a more intelligible overview of the trend, is included for convenience (figure 4).

[3] Architecture, Buildings, Criticism, Decoration and Ornament; Drafting and Presentation; Historic Architectural Preservation; History, Individual Architects and Firms; Interior Design, Landscape Architecture, Project Planning and Management; Regional Architecture, Security Design, Sustainability and Green Design; Urban and Land Use Planning; Vernacular Architecture.

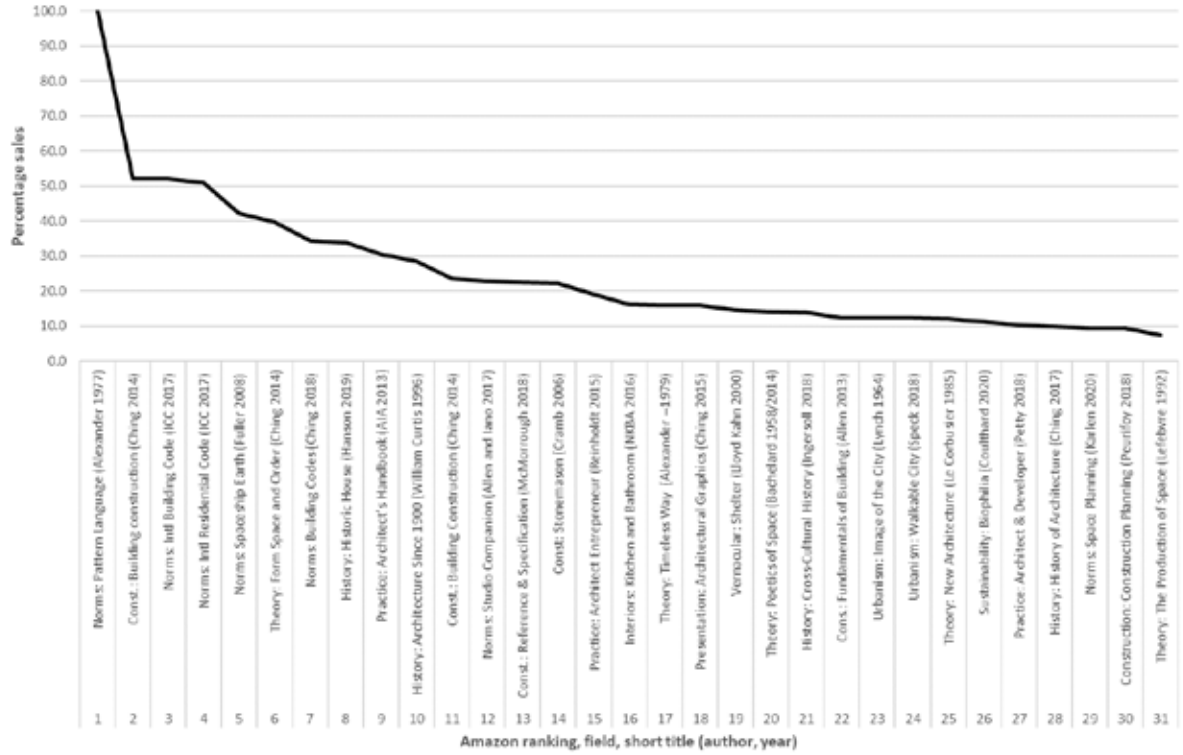


Figure 4
Ranking of the top 31 bestselling architectural books on Amazon (source: Steyn).

At this point, it is perhaps prudent to ask what *should* architects be reading? The South African Council for the Architectural Profession (SACAP) is very specific about what the skills and knowledge of an architectural professional should be. A document titled "The SACAP Competencies" describes the competencies required for each of the categories of architectural professionals, as defined in Architectural Profession Act, 2000 (Act No. 44 of 2000).[4] It was compiled by the Standards Generating Body (SGB) for Architecture and was intended as the interface between academia and practice. The document describes 10 outcome fields that represent "[t]he essential skills and knowledge required to practise architecture in a sustainable, socially responsible and financially viable way" (figure 5). In 2012, when these competencies were first published, the outcome fields were ranked with design first and office practice last. In 2021, office practice was ranked first, design in the middle, and building services last. The significance of these rankings has never been explained.[5] Worldwide the training and practice of architecture are guided and regulated in a similar manner and broadly according to similar criteria.

[4] https://www.sacapsa.com/document/view/appendix-a-the-sacap-competencies-final-2021.

[5] Together with Professors Karel Bakker, Roger Fisher and others, I was a member of the original Standards Generating Body (SGB) for Architecture. The ranking was discussed, but being academics, it was decided that design should come first. The ranking is merely numbering, however, and has no implications.

COMPETENCIES FOR THE ARCHITECTURAL PROFESSION	RANKING	
	2012	2021
Office practice, legal aspects and ethics	10	1
Computer applications	9	2
Contextual & urban relationships	5	3
Architectural history, theory and precedent	6	4
Architectural design	1	5
Environmental relationships	2	6
Contract documentation and administration	8	7
The structure of buildings	4	8
Construction technology	3	9
Building services & related technologies	7	10

Figure 5
Competencies for the architectural profession
(source: Steyn).

When the first 56 books were ranked according to architectural field (or category), the results were surprising. Books on building construction and practice guidelines were selling much better than design guidelines (100 and 90%, respectively, versus 36%). Books on history, theory, precedent, and regionalism comprised only 3% to 7,5% of sales per category. It is interesting how these figures relate to SACAP's ranking of competencies. Except for practice guidelines, which were ranked at number 10 in 2012, but number 1 in 2021, there was no alignment between what architects were reading and the perceived importance of the competencies associated with the various outcomes (figure 6).

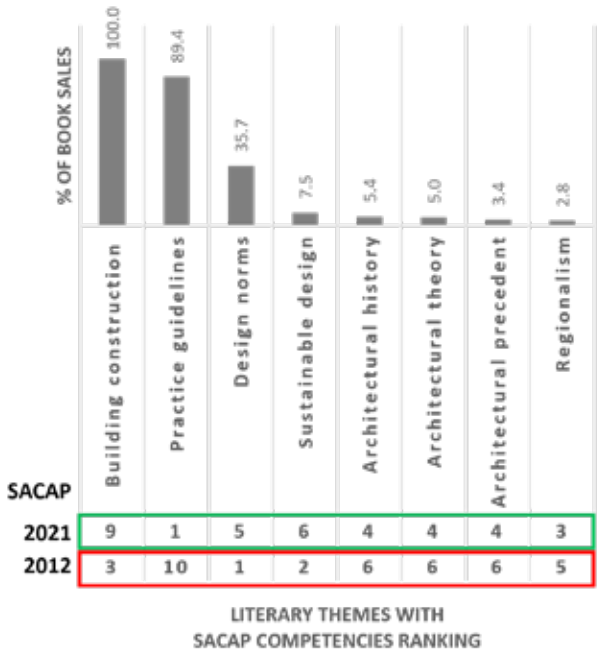


Figure 6
Sales statistics compared to SACAP's competency rankings
(source: Steyn).

Building construction

Apart from foundations, walls, floors, and roofs, building construction involves openings in walls and roofs, vertical circulation, building services, and finishes and fittings. Architects must understand the essential elements of building construction and stay informed with rapid developments in building technologies and materials. *Building Construction Illustrated* (Ching 2020) had consistently been the bestseller in this category. This could of course also be due to the fact that it is still a popular prescribed textbook at many schools of architecture. Francis DK Ching, Professor Emeritus at the University of Washington, had four books among the first 30. At times, his *Architecture Form Space and Order* (Ching 2014) even outsells *A Pattern Language*.

Other popular books in this category were *The Architecture Reference & Specification Book* (McMorrough 2018), *Fundamentals of Building Construction* (Allen and Iano 2018), and *Construction, Planning, Equipment, and Methods* (Peurifoy *et al.* 2018), all highly technical reference books.

Practice guidelines

The profession of architecture is subject to many constraints. Besides complex briefs, budget restrictions, demanding clients, and the conflicting requirements often inherent in multidisciplinary collaboration, many other factors inhibit design solutions, such as building and town planning regulations, bylaws, and energy, environmental, heritage and conservation legislation. To these limitations must be added the fact that architecture is not a particularly lucrative profession. Therefore, achieving and ensuring financial viability is challenging.

It is not surprising that *The Architect's Handbook of Professional Practice* by the American Institute of Architects (AIA 2013), which was first published in 1920, is now available in its 15th edition. Costing $214, it comprises almost 1 200 pages and consists of four parts, namely (1) The profession, (2) Firm management, (3) Project delivery, and (4) Contracts and agreements. This book was followed by *Architect Entrepreneur* (Reinholdt 2015) and *Architect & Developer* (Petty 2018).

The professional bodies in most countries offer documents similar to *The Architect's Handbook*. The South African Institute of Architects (SAIA) publishes and updates its *Practice Manual* regularly.[6]

Design norms

In the architectural field, practitioners, academics, and critics adopt what Peter Rowe (1991: 122) calls "normative positions".[7] Building codes and occupancy standards are the most basic norms.

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[6] Available on https://eportal.saia.org.za/search?q=practice+manual.

[7] Peter Rowe is the former Dean of the Harvard Graduate School of Design and a pioneer in the field of conceptual approaches to design.

Rowe adds that although Christopher Alexander's work is sometimes labelled "explanatory theory", it represents "norms founded on a strong sense of behavioural determinism and a popular or consensus view of what is proper". His bestseller by far – and for many years – has been *A Pattern Language: Towns, Buildings, Construction*. Published by Alexander and his colleagues at the University of California, Berkeley, in 1977, it is generally considered passé in schools of architecture. However, it has been the bestselling architectural book for an exceedingly long time and by a huge margin. *His Timeless Way of Living* (1979) is also on the list.

There were a number of normative books trailing *A Pattern Language*, such as *International Building Code* (Thornburg and Kimball 2021), *Building Codes Illustrated* (Ching 2018), *The Architect's Studio Companion* (Allen and Iano 2017) and *Space Planning Basics* (Karlen and Fleming 2016). *Architects' Data* (Neufert 2019) is now in its 5th edition and a standard reference manual in many practices. *A Pattern Language* and Neufert's *Architects' Data* are obviously at opposite ends of the normative spectrum, with the former more conceptual and the latter more prescriptive (figure 7).

A Pattern Language is based on the fundamental principle that humans had evolved archetypal designs for places which solve recurrent problems and satisfy complex human needs. The authors describe their 253 patterns as "timeless" and claim that they offer a practical language for building and planning based on pragmatic considerations. What really distinguishes this book from most others in the field is the social aspect of design, which considers that since physical patterns develop from behavioural ones, the social dimension is embedded in the approach: the outcome of each pattern is the human experience.

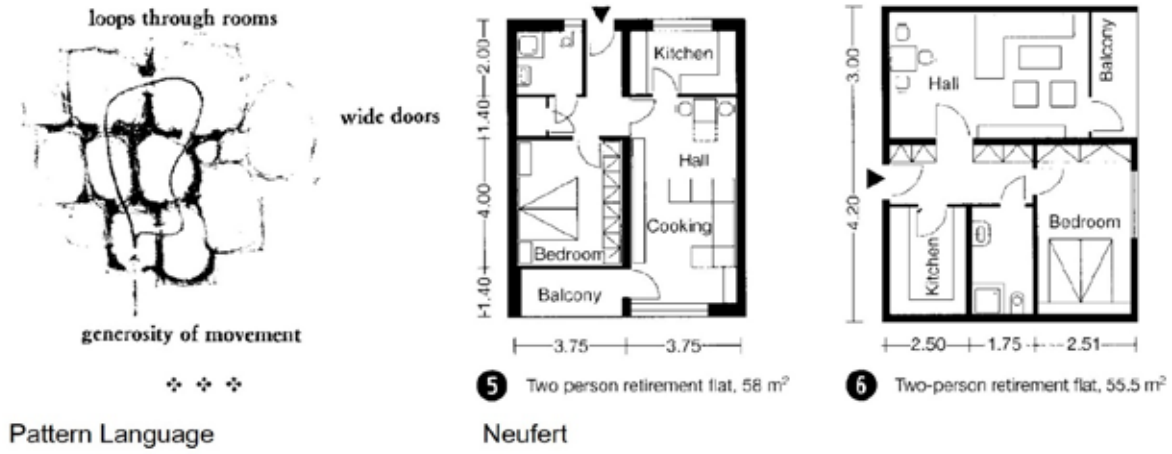

Figure 7
A comparison between normative information:
Left: Pattern #131 The flow through rooms (Alexander *et al.* 1977: 631)
Right: floor layouts for retirement flats (Neufert 2019: 168).

Sustainable design

Sustainability unquestionably overlaps with design norms. All three bestsellers, namely *Healthy Buildings: How Indoor Spaces Drive Performance and Productivity* (Allen and Macomber 2020), *Biophilia: A Handbook for Bringing the Natural World into Your Life* (Coulthard 2020) and *Rules of Thumb for Low Energy Architecture* (Heywood 2013), offer guidelines.

Most countries have introduced legislation in this regard. In South Africa, SANS 10400–XA 2nd edition (2021) of the National Building Regulations force architects to comply with strict conditions pertaining to energy usage in buildings.[8] Could it be that architects feel that since internalising the conditions for compliance is already challenging, further reading will not add much value?

Architectural history

Not all practising architects would agree with Christian Norberg-Schulz (1977: 21) who once wrote that "[t]he historical analysis orders our experience and makes judgement of solutions possible". However, several books in this field, such as *A Global History of Architecture* (Ching 2017), *Modern Architecture Since 1900* (Curtis 1996) and *Modern Architecture* (Frampton 2020), have been selling reasonably well over a considerable period. At many schools of architecture, *Sir Banister Fletcher's A History of Architecture* used to be the standard handbook. Now in its 20th edition (edited by Cruickshank 1996), it lags far behind other books, perhaps as it is very expensive ($280). I suspect many architects believe that owning one history book, the one they had to buy in university, is sufficient.

Architectural theory

If architectural history is about *what* has been built previously, then theory is about *why*. History is descriptive and theory is supposed to be explanatory. In this category, *Architecture Form Space and Order* (Ching 2014) was the undisputed bestseller, with numerous informative hand sketches and succinct, straight-forward explanatory text (figure 8).[9] It was followed by *The Timeless Way of Building* (Alexander 1979). Surprisingly, Le Corbusier's *Towards a New Architecture* (first published in English in 1931) was ranked third in architectural theory, followed a way down in the list by *Poetics of Space* (Bachelard 1958/2014), *The Production of Space* (Levebvre 1992) and *Analysing Architecture* (Unwin 2020). It is interesting that Le Corbusier never thought in terms of theory. He declared (1927: 145, 148) that "[a]rchitecture is governed by standards. Standards are a matter of logic, analysis and precise study. Standards are based on a problem which has been well stated." What he clearly meant was that standards, or norms, evolve from proven solutions. *Theorizing a New Agenda for Architecture: An Anthology of Architectural Theory 1965 - 1995* (Nesbitt 1997) is popular with lecturers, but certainly not with practitioners; without a single illustration, and focussing on philosophy rather than normative theory, the relationship of much of the contents to practice is tenuous.

[8] Available on https://store.sabs.co.za/catalog/product/view/id/2143705/s/sans-10400-xa-ed-2-00/.

[9] Even with 464 pages, this is not an intimidating book. Ching makes it easy to access information, dividing the index into Buildings (6 pages), Designers (2 pages) and subject matter (5 pages).

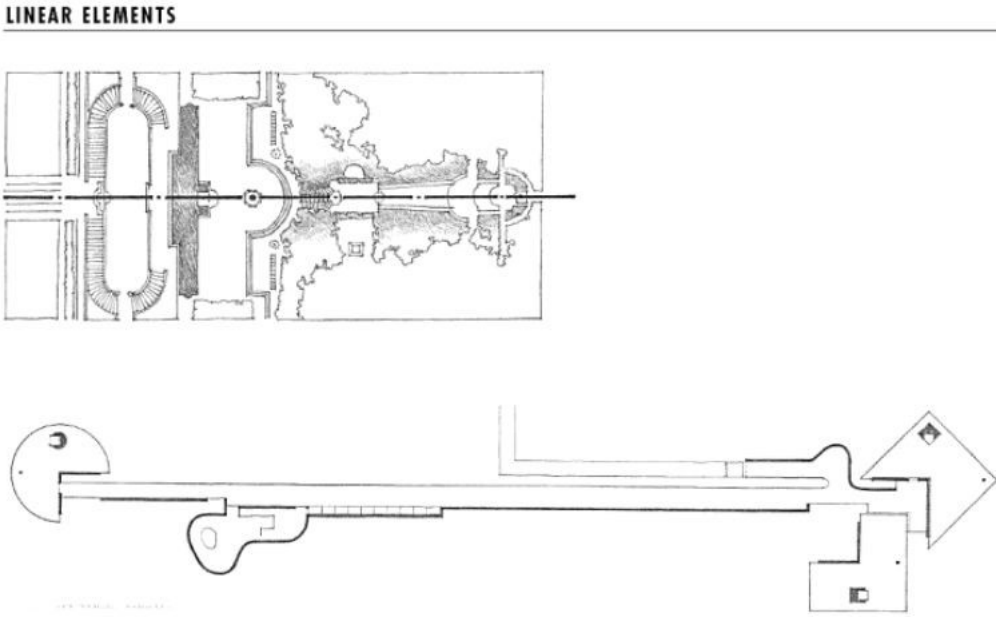

Figure 8
Illustrating linear configurations
(Ching 2014: 12. Text erased).

Peter Rowe (191: 149-150) allocated only one-and-a-half pages out of 288 to theory, making the point that theory must strike "a balance between aloof abstractions providing for nearly infinite interpretations and concrete prescriptive principles". If the explanatory dimension of theory cannot be sufficiently substantiated, the adoption of a theory becomes "merely a matter of personal taste". Here he clearly refers to what Mallgrave and Goodman (2011: 193) describe as a "trove of fashionable theory that few could truly digest or intelligibly apply to their work". These are obviously the writings of Martin Heidegger (via Norberg-Schulz), and what Dawkins (2021: 57) describes as the "lamentably influential school of francophoney obscurantism", referring specifically to Jacques Derrida and Michel Foucault (2021: 157). Derrida is closely associated with deconstructivism, as interpreted by Peter Eisenman, but impossible to understand to the extent that Francis Mallgrave and David Goodman (2011: 154) write of Derridean elusiveness.

Prescribed reading in schools of architecture unquestionably boost sales of books such as *Lefebvre for Architects* (Coleman 2015), *Foucault for Architects* (Fontana-Giusti 2013) and *Derrida for Architects* (Coyne 2011). It must be noted that Gaston Bachelard's *Poetics of Space* (1958/2014) is selling quite well, undoubtedly as domesticity is the topic and because of the translation skills of Maria Jols. Derrida and Lefebvre are not doing so well. Of the latter, a reviewer wrote: "It goes into the classification of a book that must have sounded more brilliant in French." [sic!]

The value of philosophers commenting on architecture is questionable. Most try to explain how environments are understood, but the question arises whether they are truly qualified to do that. In conversation practising architects sometimes suggest that academia is embracing the popular philosophers simply to mystify architectural theory (personal observation).

Architectural precedent

Most architects in practice – people who must earn a living designing buildings – rarely share academics' enthusiasm for theory. Rather, conceptualisation in architecture is mostly dependent on precedent (Fawcett 2003: 1). Harsha Munasinghe (2010) sums it up as follows: "[An] architect is not commissioned to do research, but to design. At his/her best, the architect may look at some built environments in the name of precedent studies." Precedents can be historical, but in most instances, they are recent trend-setting buildings.

Caroline Choi (2005: 153-178) explains how James Stirling studied Le Corbusier's *Oeuvre Complete,* as a student and as an architect. Besides Le Corbusier, Stirling owned books on other architects such as Alvar Aalto, Richard Neutra, Alfred Roth and Marcel Breuer, but only one on theory.[10] It was a prescribed handbook from his days as a student at the Liverpool School of Architecture.

At present, the bestseller in this category is Bjarke Ingels' (2008) *Yes is More*. Ingels' firm, BIG (Bjarke Ingels Group), is currently producing some of the most remarkable and original architecture globally, and *Yes is More* explains in considerable detail how they arrived at solutions. That level of describing a design process is rare in architectural literature. *Yes is More* is followed by books such as the *Architecture Now* series by Jodidio (2005-15), and then come monographs such as James Steele's (1999) *Complete Balkrishna Doshi*.

The question arises as to why books on precedent, the prime source of inspiration and ideas for practising architects, sell even less than books on theory. I suspect the answer lies in the prevalence of digital media. The latest architectural designs are not only presented on websites such as Dezeen.com and ArchDaily.com, but most architectural firms display their projects on their own websites (figure 9).[11] With an abundance of up-to-date information for free and instantly available, there is simply no need to buy books on precedent.

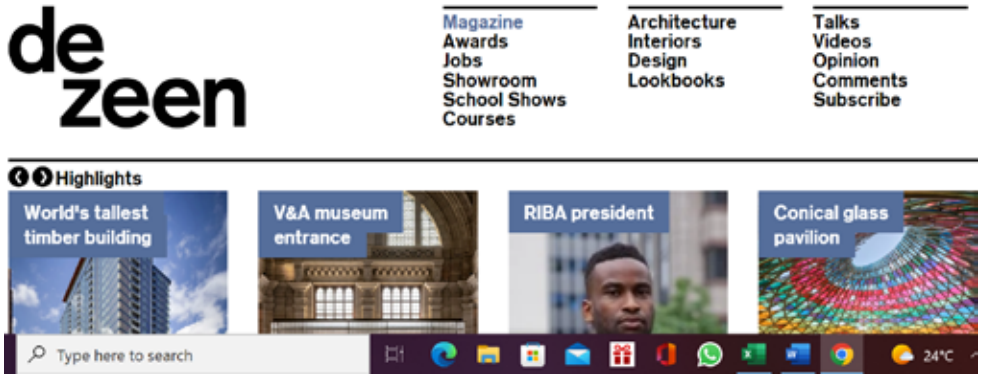

Figure 9
A fragment of Dezeen's home page
(screenshot on 6 August 2022)

[10] *Towards a New Architecture by Gunnar Asplund and Alfred Roth (1943).*

[11] ArchDaily claims to have more than 17 million monthly readers (https://www.archdaily.com). It has become one of the 1 000 most visited websites on the Internet, making it the most visited architecture network in the world.

Regionalism

Although most architects claim to follow regional sensibilities, regionalism is the least popular theme. Apparently practising architects do not think it is necessary to read about it. As an accomplished architect told me, he derives "identity" from the context, by reinterpreting elements of the local vernacular and respecting the architecture of the place.

For those interested in reading, there are a number of enlightening publications. *Architectural Regionalism* (Canizaro 2007) provides an overview of the theories of the most pertinent authors. The writings of the stalwarts, Lefaivre and Tzonis, remain interesting, including *Architecture of Regionalism in the Age of Globalization: Peaks and Valleys in the Flat World* (2012) and *Critical Regionalism: Architecture and Identity in a Globalized World* (2003). The least popular book in this category, and in fact of all the books listed, namely *Transcultural Architecture: The Limits and Opportunities of Critical Regionalism* (Botz-Bornstein 2015), is a well-argued book, but aimed at scholars.

Conclusion

Although the statistics present a snapshot of the ranking of architectural books on Amazon.com at a specific moment, there is indisputably a relatively consistent trend in the buying profile. With books on building construction and design norms outselling the other categories by a considerable margin, it seems as if Vitruvius' sequence of structural stability and appropriate spatial accommodation preceding attractive appearance is still valid. The low sales of books on precedent does not indicate a lack of interest, but is rather evidence of the evolution of Internet-based sources of information.

The average sales per category also obscure the popularity of publications such as Ching's *Form Space and Order*. The sales statistics show absolutely no correlation to SACAP's "ranking" of competencies. With ever-increasing regulatory restrictions impacting projects, and a very competitive environment in which to practise architecture, the market for good practice guidelines is expected to grow. Of the philosophers, only Bachelard made it into the top 31. Their contribution to designing good buildings remain questionable. On the other hand, books like *A Pattern Language* and *Form Space and Order* provide the knowledge for the seamless transition from a school's design studio to an architectural firm.

Works cited

Alexander, Christopher. 1979. *The Timeless Way of Building*. New York: Oxford University Press.

Alexander, Christopher, Ishikawa, Sara and Silverstein, Murray. 1977. *A Pattern Language: Towns, Buildings, Construction*. New York: Oxford University Press.

Allen, Edward and Iano, Joseph. 2017. *The Architect's Studio Companion: Rules of Thumb for Preliminary Design*. New Jersey: Wiley.

Allen, Edward and Iano, Joseph. 2018. *Fundamentals of Building Construction: Materials and Methods*. New Jersey: Wiley.

Allen, Joseph and Macomber, John. 2020. *Healthy Buildings: How Indoor Spaces Drive Performance and Productivity*. Cambridge, Massachusetts: Harvard University Press.

AIA (American Institute of Architects). 2013. *The Architect's Handbook of Professional Practice*. New Jersey: Wiley.

Amy Astley, Amy (editor). 2019. *Architectural Digest at 100: A Century of Style*. New York: Abrams.

Bachelard, Gaston. 1958/2014. *The Poetics of Space*, translated by Maria Jolas. New York: Penguin Classics.

Botz-Bornstein, Thorsten. 2015. *Transcultural Architecture: The Limits and Opportunities of Critical Regionalism*. New York: Routledge.

Canizaro, Vincent (editor). 2007. *Architectural Regionalism: Collected Writings on Place, Identity, Modernity, and Tradition*. New York: Princeton Architectural Press.

Ching, Francis. 2014. *Architecture: Form, Space, and Order*. New York: Van Nostrand Reinhold.

Ching, Francis. 2017. *A Global History of Architecture*. New Jersey: Wiley.

Ching, Francis. 2018. *Building Codes Illustrated: A Guide to Understanding the 2018 International Building Code*. New Jersey: Wiley.

Ching, Francis. 2020. *Building Construction Illustrated*. New Jersey: Wiley.

Choi, Caroline. 2005. Stirling's coming of age: The development of James Stirling's style in reaction to the late work of Le Corbusier, *Contrapposto 4* (the annual academic student journal of the Fine Art Department of the University of Toronto): 153-178.

Coleman, Nathaniel. 2015. *Lefebvre for Architects*. London: Routledge.

Collins, Peter, Gowans, Alan, Ackerman, James and Scruton, Roger. 2021. Architecture, *Encyclopedia Britannica*, retrieved from www.britannica.com/topic/architecture on 29 July 2022.

Coulthard, Sally. 2020. *Biophilia: A Handbook for Bringing the Natural World into Your Life*. London: Kyle.

Coyne, Richard. 2011. *Derrida for Architects*. London: Routledge.

Cruickshank, Dan (editor). 1996. *Sir Banister Fletcher's A History of Architecture*. London: Architectural Press.

Curtis, William. 1996. *Modern Architecture Since 1900*. London: Phaidon.

Dawkins, Richard. 2021. *Books do Furnish a Life: Reading and Writing Science*. London: Penguin.

Engholm, Ida. 2011. Positions in contemporary design research, *Swedish Design Research Journal* 2(11): 48-62.

Fawcett, Peter. 2003. *Architecture Design Notebook*. London: Architectural Press.

Fontana-Giusti, Gordana. 2013. *Foucault for Architects*. London: Routledge.

Frampton, Kenneth. 2020. *Modern Architecture: A Critical History*. New York: Thames & Hudson.

Gordon, James. 2003. *Structures: Or Why Things Don't Fall Down*. New York: Hachette.

Heywood, Huw. 2013. *Rules of Thumb for Low Energy Architecture*. London: RIBA.

Hunter, Andy. 2010. Every book lover should fear this graph, retrieved from https://medium.com/@andyhunter777/every-book-lover-should-fear-this-graph on 2022 11 28.

Ingels, Bjarke. 2008. *Yes is More*. Köln: TASCHEN.

Jodidio, Philip. 2015. *Architecture Now!* Köln: TASCHEN.

Karlen, Mark and Fleming, Rob. 2016. *Space Planning Basics*. New Jersey: Wiley.

Lawson, Bryan. 2004. *What Designers Know*. Oxford: Architectural Press.

Le Corbusier (1931) *Towards a new architecture*, translated by Frederick Etchells. London: John Rodker.

Lefaivre, Liane and Tzonis, Alexander. 2003. *Critical Regionalism: Architecture and Identity in a Globalized World*. Munich: Prestel.

Lefaivre, Liane and Tzonis, Alexander. 2012. *Architecture of Regionalism in the Age of Globalization*. London: Routledge.

Lefebvre, Henri. 1974/1991. *The Production of Space*, translated by Donald Nicholson-Smith. Oxford: Blackwell.

Mallgrave, Francis and Goodman, David. 2011. *An Introduction to Architectural Theory: 1968 to the Presen*t. Chichester: Wiley-Blackwell.

Maré, Estelle Alma. 2017. Fear and pleasure aroused by built environments, South *African Journal of Art History* 32(1): 57-86.

McMorrough, Julia. 2018. The *Architecture Reference & Specification Book Updated & Revised: Everything Architects Need to Know Every Day*. Beverley: Rockport.

Munasinghe, Harsha. 2010. Introduction to an Architectural Theory: Design as Theory Application, *Built-Environment – Sri Lanka* 08(01): 20-2.

Nesbitt, Kate. 1997. *Theorizing a New Agenda for Architecture: An Anthology of Architectural Theory 1965-1995*. New York: Princeton Architectural Press.

Neufert, Ernst. 2019. *Neufert Architects' Data*. New Jersey: Wiley.

Norberg-Schulz, Christian. 1977. *Intentions in Architecture*. Cambridge, Massachusetts: MIT Press.

Petty, James. 2018. *Architect & Developer: A Guide to Self-Initiating Projects*. New York: PostScript.

Peurifoy, Robert, Schexnayder, Clifford, Schmitt, Robert and Shapira, Aviad. 2018. *Construction, Planning, Equipment, and Methods*. New York: McGraw-Hill.

Reinholdt, Eric. 2015. *Architect and Entrepreneur: A Field Guide to Building, Branding, and Marketing Your Startup Design Business*. Mount Desert, Maine: CreateSpace.

Rowe, Peter. 1991. *Design Thinking*. Cambridge, Massachusetts: MIT Press.

Steele, James. 1999. *Complete Balkrishna Doshi*. London: Thames & Hudson.

Steyn, Gerald. 2021. The culture and design of contemporary South African single dwellings, *South African Journal of Art History*, 36(2): 23-41.

Thornburg, Douglas and Kimball, Chris for ICC (International Code Council). 2021. *International Building Code Illustrated Handbook*. New York: McGraw-Hill.

Unwin, Simon. 2020. *Analysing Architecture: The Universal Language of Place-Making*. Abington: Routledge.

Vitruvius, Pollio and Morgan, M.H. 1960. *The Ten Books on Architecture*. New York: Dover Publications.

Wotton, Henry. 1624. *The Elements of Architecture*. Edited by Charles Davis with an anthology of critical commentary. London: John Bill.

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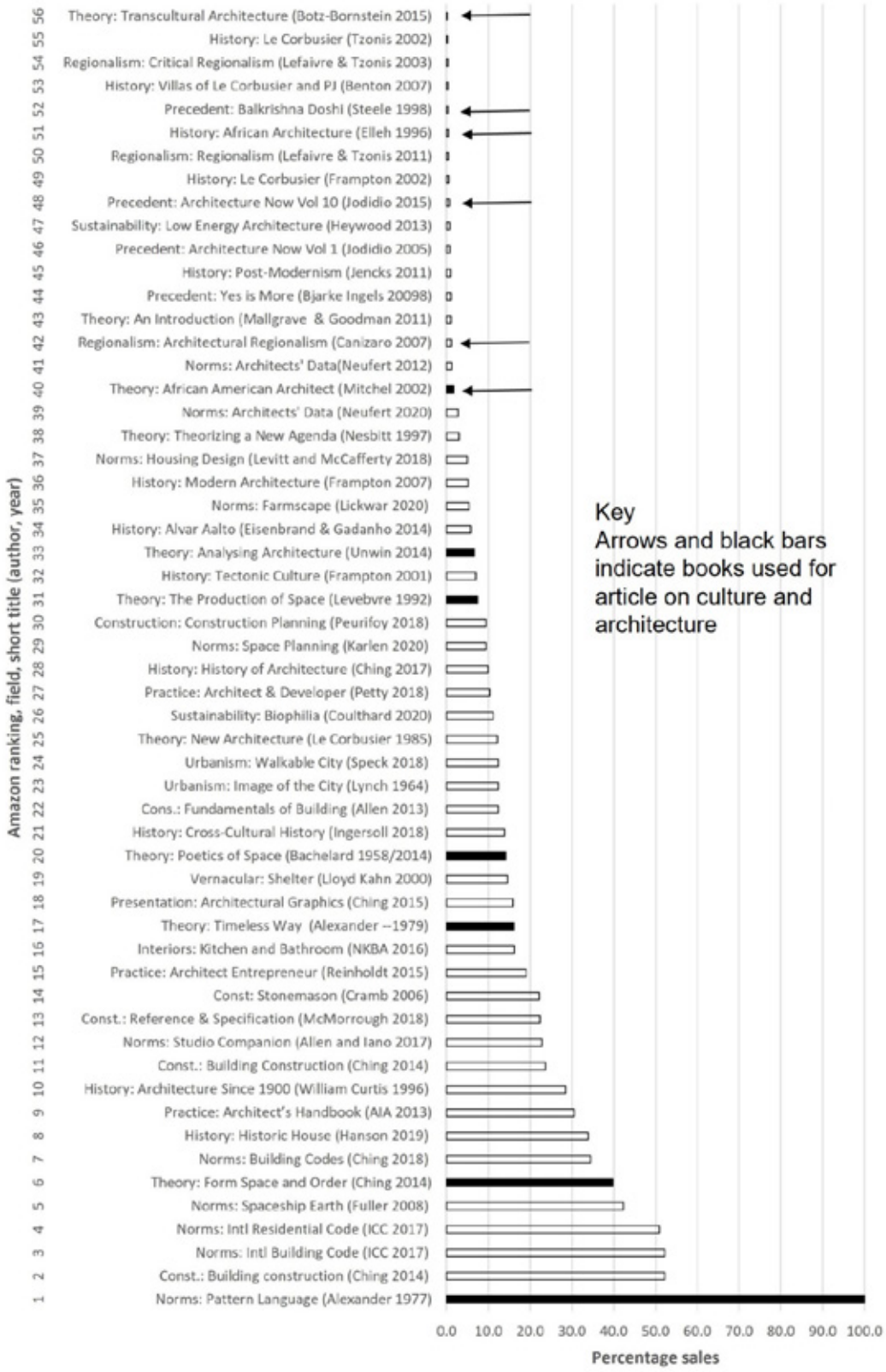
Appendix A

Rank	Title of book	No of pages	Space/ spatial	Place	Context	Culture	Tradition	Region/ —al/—ism	People	Word count	Words/ page
1	Architectural Regionalism (Canizaro 2007)	464	114	206	71	225	167	354	143	**1280**	**2.76**
			0.25	0.44	0.15	0.48	0.36	0.76	0.31		
2	The Production of Space (Lefebvre 1974/1991)	400	655	118	57	74	42	26	77	**1049**	**2.62**
			1.64	0.30	0.14	0.19	0.11	0.07	0.19		
3	Transcultural Architecture (Botz-Bornstein 2015)	220	64	73	55	109	78	99	43	**521**	**2.37**
			0.29	0.33	0.25	0.50	0.35	0.45	0.20		
4	Analysing Architecture (Unwin 2009)	336	257	223	16	23	53	7	95	**674**	**2.01**
			0.76	0.66	0.05	0.07	0.16	0.02	0.28		
5	African Architecture (Elleh 1996)	354	48	91	7	133	164	124	130	**697**	**1.97**
			0.14	0.26	0.02	0.38	0.46	0.35	0.37		
6	A Pattern Language (Alexander et al. 1977)	1,169	412	522	189	46	43	48	516	**1776**	**1.52**
			0.35	0.45	0.16	0.04	0.04	0.04	0.44		
7	The … African-American Architect (Mitchell 2003)	320	30	72	26	172	13	20	95	**428**	**1.34**
			0.09	0.23	0.08	0.54	0.04	0.06	0.30		
8	Balkrishna Doshi (Curtis 1988)	181	69	40	13	30	45	19	21	**237**	**1.31**
			0.38	0.22	0.07	0.17	0.25	0.10	0.12		
9	The Timeless Way of Building (Alexander 1979)	522	110	199	31	25	18	45	172	**600**	**1.15**
			0.21	0.38	0.06	0.05	0.03	0.09	0.33		
10	Architecture Form, Space, and Order (Ching 2014)	400	294	57	33	19	17	4	8	**432**	**1.08**
			0.74	0.14	0.08	0.05	0.04	0.01	0.02		
11	Poetics of Space (Bachelard 1958/2014)	304	100	80	0	13	7	18	21	**239**	**0.79**
			0.33	0.26	0.00	0.04	0.02	0.06	0.07		
12	Architecture Now! (Jodidio 2015)	571	91	35	12	0	17	10	12	**177**	**0.31**
			0.16	0.06	0.02	0.00	0.03	0.02	0.02		

Appendix B


Amazon ranking, field, short title (author, year)
56 Theory: Transcultural Architecture (Botz-Bornstein 2015)
55 History: Le Corbusier (Tzonis 2002)
54 Regionalism: Critical Regionalism (Lefaivre & Tzonis 2003)
53 History: Villas of Le Corbusier and PJ (Benton 2007)
52 Precedent: Balkrishna Doshi (Steele 1998)
51 History: African Architecture (Elleh 1996)
50 Regionalism: Regionalism (Lefaivre & Tzonis 2011)
49 History: Le Corbusier (Frampton 2002)
48 Precedent: Architecture Now Vol 10 (Jodidio 2015)
47 Sustainability: Low Energy Architecture (Heywood 2013)
46 Precedent: Architecture Now Vol 1 (Jodidio 2005)
45 History: Post-Modernism (Jencks 2011)
44 Precedent: Yes is More (Bjarke Ingels 20098)
43 Theory: An Introduction (Mallgrave & Goodman 2011)
42 Regionalism: Architectural Regionalism (Canizaro 2007)
41 Norms: Architects' Data(Neufert 2012)
40 Theory: African American Architect (Mitchel 2002)
39 Norms: Architects' Data (Neufert 2020)
38 Theory: Theorizing a New Agenda (Nesbitt 1997)
37 Norms: Housing Design (Levitt and McCafferty 2018)
36 History: Modern Architecture (Frampton 2007)
35 Norms: Farmscape (Lickwar 2020)
34 History: Alvar Aalto (Eisenbrand & Gadanho 2014)
33 Theory: Analysing Architecture (Unwin 2014)
32 History: Tectonic Culture (Frampton 2001)
31 Theory: The Production of Space (Levebvre 1992)
30 Construction: Construction Planning (Peurifoy 2018)
29 Norms: Space Planning (Karlen 2020)
28 History: History of Architecture (Ching 2017)
27 Practice: Architect & Developer (Petty 2018)
26 Sustainability: Biophilia (Coulthard 2020)
25 Theory: New Architecture (Le Corbusier 1985)
24 Urbanism: Walkable City (Speck 2018)
23 Urbanism: Image of the City (Lynch 1964)
22 Cons.: Fundamentals of Building (Allen 2013)
21 History: Cross-Cultural History (Ingersoll 2018)
20 Theory: Poetics of Space (Bachelard 1958/2014)
19 Vernacular: Shelter (Lloyd Kahn 2000)
18 Presentation: Architectural Graphics (Ching 2015)
17 Theory: Timeless Way (Alexander --1979)
16 Interiors: Kitchen and Bathroom (NKBA 2016)
15 Practice: Architect Entrepreneur (Reinholdt 2015)
14 Const: Stonemason (Cramb 2006)
13 Const.: Reference & Specification (McMorrough 2018)
12 Norms: Studio Companion (Allen and Iano 2017)
11 Const.: Building Construction (Ching 2014)
10 History: Architecture Since 1900 (William Curtis 1996)
9 Practice: Architect's Handbook (AIA 2013)
8 History: Historic House (Hanson 2019)
7 Norms: Building Codes (Ching 2018)
6 Theory: Form Space and Order (Ching 2014)
5 Norms: Spaceship Earth (Fuller 2008)
4 Norms: Intl Residential Code (ICC 2017)
3 Norms: Intl Building Code (ICC 2017)
2 Const.: Building construction (Ching 2014)
1 Norms: Pattern Language (Alexander 1977)
Key
Arrows and black bars indicate books used for article on culture and architecture
0.0 10.0 20.0 30.0 40.0 50.0 60.0 70.0 80.0 90.0 100.0
Percentage sales

Drawing with precious metals utilising drawing techniques from Leonardo da Vinci to Joshua Henderson

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Drawing with precious metals is one of the oldest mediums/techniques surviving from the Middle Ages, during which it was used for manuscript illumination. The Renaissance is the time during which the silverpoint medium was primarily used. This medium was widely used until the graphite pencil almost replaced it in the seventeenth century. Silverpoint is closely related to etching because of its directness and the grouping of drawn lines to produce the tone and value of the subject. Silverpoint cannot be used on ordinary paper but requires a specially prepared surface to grip the silver left by the drafter's marking actions. For centuries artists have made realistic and detailed depictions of the world surrounding them in various media. One group of such mark-making media is jointly called metalpoint. Different metals such as lead, tin, silver, gold, and copper can be used to create metalpoint archival drawings. The old masters have favoured metalpoint as an art form and medium for centuries to execute artworks ranging from abstract to conceptual to more traditional and realistic works. In recent years, the draughtsman, Joshua Henderson, indulged his artistic talent in the subtle and challenging medium of drawing with precious metals. This article serves as a guideline for artists wishing to draw with precious metals.
Keywords: metalpoint, silverpoint, drawing, gesso, stylus, precious metals, Joshua Henderson, draughtsman

Tegnieke om met edelmetale te teken van Leonardo da Vinci tot Joshua Henderson
Een van die oudste tekenmediums/-tegnieke wat uit die Middeleeue behoue gebly het, is om met 'n verskeidenheid van edelmetale te teken. Hierdie subtiele tekeninge is aanvanklik gebruik om voorsketse vir geïlumineerde manuskripte te maak. Gedurende die Renaissance is die silwerpunt-medium tot nuwe hoogtes gevoer. Gedurende die die sewentiende eeu is silwerpunt as medium deur grafiet en die grafietpotlood vervang. Silwerpunttekeninge lyk baie soos etse omdat die direkte groepering van getekende lyne gebruik word om toonwaarde en skakerings te skep. Silwerpunt is uniek omdat daar nie op gewone tekenpapier geteken kan word nie. Die metaalpuntmedium vereis dat die oppervlak met verskeie lae gesso voorberei word, voordat die tekenkunstenaar met sy metaalpunt daarop kan teken. Metaalpunt is die versamelnaam om met edelmetale te teken. 'n Wye verskeidenheid van metale soos lood, tin, silwer, goud en koper kan gebruik word om mee te teken. Reeds vanaf die vroegste tye het tekenkunstenaars metaalpunt gebruik. Kunswerke het gewissel van abstrakte en konseptuele werke, tot meer tradisionele en realistiese tekeninge. Die tekenkunstenaar, Joshua Henderson, het tot onlangs die uitdagende silwerpuntmedium gebruik om sy subtiele tekeninge met edelmetale te maak. Hierdie artikel het ten doel om riglyne daar te stel vir tekenkunstenaars wat met edelmetale wil teken.
Sleutelwoorde: metaalpunt, silwerpunt, tekening, gesso, stilus, edelmetale, Joshua Henderson, tekenkunstenaar

Metalpoint, better known as silverpoint, is a Medieval drawing technique many contemporary artists do not practise. Metalpoint and silverpoint, in particular, were extremely popular with Renaissance artists, and then it almost disappeared in the eighteenth century, only to be revived in the nineteenth century. The historic metalpoint medium was referred to as silverpoint until the twentieth century because of the shimmering hue it leaves on the drawn surface. Although many historical and traditional techniques are still used today, the medium was pushed in new directions by contemporary artists that started using unexpected

drawing implements, such as a paper clip, the tines of a cake fork, and the serrated edge of a butter knife,[1] unconventional subject matter, and alternative methods.

In 2019, two contemporary silverpoint artists Tom Mazzullo[2] and fellow artist, Susan Schwalb,[3] have written a comprehensive silverpoint manual. This all-inclusive metalpoint guide entitled, *Silverpoint and metalpoint drawing* gave a historical overview. They described various tools, supports, and drawing mediums used by artists over time. In Mazzulo's latest abstract drawings, he frequently draws diverse subjects, such as warped and coiled paper fragments centrally placed on the drawing surface. See, for example, his silverpoint drawing on casein-prepared birch plywood entitled *Two-part Invention*.[4]

I became interested in practising metalpoint as a medium in 2015 after seeing the British Museum's historical metalpoint exhibition *Drawing in Silver and Gold: Leonardo to Jasper Johns* in room 90 of the British Museum in London.[5] The impressive exhibition of more than one hundred superb metalpoint drawings was organised by the Washington National Gallery of Art and museums and private collections worldwide. Two metalpoint drawings of note were among the exhibition's masterpieces: Leonardo da Vinci's *Head of a Warrior* (figure 1) and Jean Fouquet's *Portrait of a Man*.[6]

In Leonardo's *Head of a Warrior,* he depicts a mighty armoured warrior in minute detail. He portrays him in profile with a stark face, dressed with a lion breastplate and an elaborate and winged helmet on his head. The soft curls of his hair creep from underneath the pointy helmet. The face and armour are painstakingly drawn in detail. The sitter's protective suit of armour (possibly metal), the soft and delicate curls of his hair and his robust facial features are modelled with endless patience line by line to produce shadows and model the facial features.

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[1] Schwalb, Susan and Mazzullo, Tom. 2019: 37.

[2] Tom Mazzullo (American, b. 1968) studied at the Tyler School of Art, Temple University, USA and was awarded a BFA in Printmaking in 1990. In 1993, he obtained a Master of Fine Arts from Syracuse University. He lectured in drawing, and exhibited nationwide, and his artworks are represented in a number of distinguished public and private collections in the USA.

[3] The contemporary, abstract silverpoint draughtsperson, Susan Schwalb, graduated from Carnegie-Mellon University in Pittsburgh, Pennsylvania, in 1965. Her artwork can be seen in many major public collections, including the British Museum, in London, the Museum of Modern Art and the Metropolitan Museum of Art in New York City, and the Kupferstichkabinett, in Berlin.

[4] *Two-part Invention*, 2022, silverpoint on casein-prepared birch plywood, 30.48 x 30,48 cm. Retrieved from https://www.instagram.com/p/ClSJqdJM2tP/?hl=en on 5 December 2022.

[5] London. The British Museum. "Drawing in Silver and Gold: Leonardo to Jasper Johns exhibition," 10 September – 6 December 2015. The show was curated by the keeper of prints and drawings, Hugo Chapman, the art historian Giulia Bartrum and the curator of Dutch and Flemish prints and drawings, An van Camp.

[6] Jean Fouquet's Portrait of a Man. Retrieved from https://www.metmuseum.org/art/collection/search/337088 on 5 December 2022.

Figure 1
Leonardo da Vinci, *Head of a Warrior,* c. 1475/1480, silverpoint on cream-prepared paper. The British Museum, London (retrieved from the public domain https://commons.wikimedia.org/wiki/File:Head_of_a_Warrior_-_Da_Vinci_1.jpg)

Historical perspective

In his biography and artist's statement, Mazzullo stated that he usually draws objects from life, observing and understanding the subject matter he sees in front of him. He continues to say that silverpoint is the primary tool he uses for making his serene drawings "because it demands patience to produce anything good."[7] If one looks at the metalpoint drawings of Mazzullo, especially his *Inventions* series (2021-2022),[8] it is quite clear that he takes his inspiration from the peculiar graphic and geometric (polyhedral) designs of artists such as the etching artist Giovanni Bracelli, the Nuremberg goldsmith, artist and printmaker Wenzel Jamnitzer (1507/1508-1585) icosidodecahedron (figure 2), and Leonardo da Vinci's metalpoint drawings.

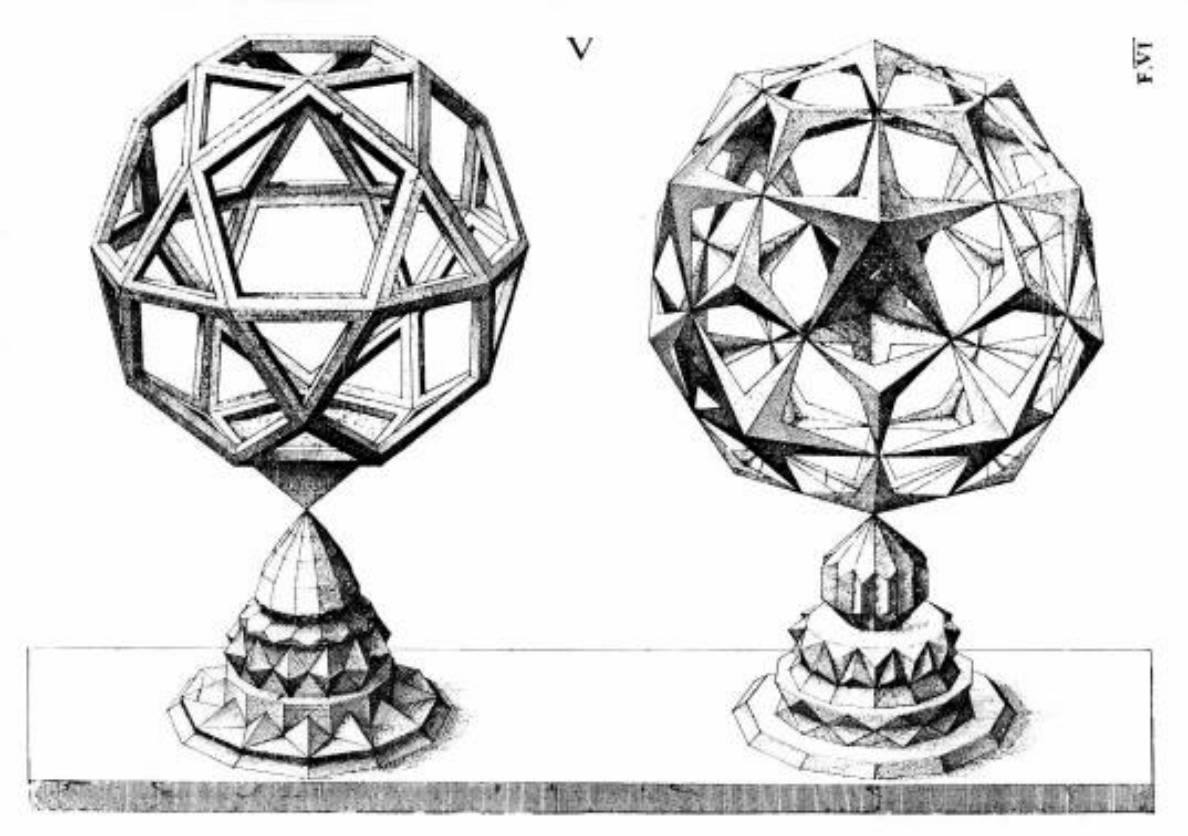

Figure 2
Wenzel Jamnitzer's two conceptual icosidodecahedra with freeform bases. The image on the left follows the style of da Vinci, while the one on the right is entirely original. Both icosidodecahedra rest on conceptual points (retrieved from the public domain https://www.georgehart.com/virtual-polyhedra/jamnitzer.html).

Drawing with silverpoint was frequently used throughout the late Gothic and early Italian Renaissance periods. Integral to this technique/practice is the choice of ground. Coloured and tinted grounds became exceedingly popular during the Renaissance. In Chapter 2 of his treatise, Cennino d'Andrea Cennini (1960) describes the process of tinting paper. During the early 1400s,

[7] Tom Mazzullo – biography and artist's statement. Retrieved from https://www.tommazzullo.com/bio.html on 15 December 2021.

[8] Mazzulo's *Inventions* series. Retrieved from https://www.tommazzullo.com/inventions.html on 5 December 2022.

Italian artists such as Rogier van der Weyden and Leonardo da Vinci started experimenting and tinted their gesso with watercolours, gouache, or pigments to prime their drawing surfaces, grounds, and papers. They added different quantities of yellow ochre, carmine red, green - Terre Verte,[9] blue and brown – raw umber and terra d'ombra bruciata[10] pigments to their gesso to prime their surfaces. Pink-tinted paper can be created by mixing lead white, vermillion, and bone ash to a smooth ground before coating the paper. See, for example, Filippino Lippi's delicate metalpoint drawing of two upright male figures, *Standing youth with hands behind his back and a seated youth reading* (1457/58-1504). This gentle and nuanced metalpoint drawing is executed on a pink-tinted support. On these colour-tinted surfaces, the mid to dark tonal values of the delicate metalpoint drawings on coloured papers are highlighted with white chalk, white gouache lines and white painted areas. Lippi emphasised his drawing of limited tonal value with subtle white gouache brush marks to create subtle tonal effects in his drawing.[11]

Other master silverpoint practitioners were the Flemish painter, Jan van Eyck (c. 1390-1441), the German painter Albrecht Dürer (1471-1528) and the Florentine artists Leonardo da Vinci (1452-1519), and Raffaello Sanzio da Urbino, better known as Raphael (1483-1520). They sought to create delicately toned and detailed drawings. In the oldest self-portrait drawing by Dürer, *Self-portrait at the age of 13* (1484), he depicts himself as a young boy with long hair in a profile view. His long, elegant index finger points to something outside the picture. This silverpoint drawing portrays Dürer's confidence as a draughtsman and artist of the 15th century.

When new drawing mediums such as graphite and drawing chalks became more readily available during the 1500s, the demise of silverpoint was imminent. The Dutch artists, Hendrick Goltzius (1558-1617) and Rembrandt Harmenszoon van Rijn (1606-1669) used silverpoint during the seventeenth century until it became obsolete in the eighteenth century. See, for example, Rembrandt's tiny and sensitive silverpoint drawing, *Portrait of Saskia as a bride* (1633).[12] In this work, Rembrandt depicts his young wife, Saskia van Uylenburgh, wearing a wide-brimmed hat, holding a rose in her hand and smiling at her fiancé and the onlooker. During the Baroque, women were frequently portrayed with a flower, especially a rose, depicting the transience of life and happiness. In the text below the drawing, Rembrandt explains that he showed his twenty-one-year-old wife three days after the marriage.[13]

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[9] Terre Verte (green earth) is a soft green colour which is also known as Verona Green, as it was originally mined near Verona, Italy, until 1940. Terre Verte is a highly permanent pigment. It is primarily composed of the silicate minerals celadonite and glauconite. When heated, it will turn brown (burnt green earth) (https://www.winsornewton.com/na/articles/colours/spotlight-on-terre-verte/). "Historically used as a bole for gilding and as an underpainting for flesh tones in Medieval painting (verdaccio)" (https://gamblincolors.com/terre-verte/).

[10] Terra d'ombra bruciata (umber) is a natural brown or reddish-brown earth pigment containing iron oxide and manganese oxide. Umber is darker than other pigments, such as sienna and ochre.

[11] See the Lippi drawing - https://commons.wikimedia.org/wiki/File:Standing_Youth_with_Hands_Behind_His_Back,_and_a_Seated_Youth_Reading_(recto);_Two_Studies_of_Hands_(verso)_MET_36.101.1_RECTO.jpg.

[12] https://artsandculture.google.com/asset/portrait-of-saskia-as-a-bride-rembrandt/xQFyoOfRaGb5TA.

[13] Rembrandt wrote: "This is a likeness of my wife, drawn when she was 21 years old, on the third day of our betrothal. 8 January 1634. The word 'betrothal' refers to the promise of marriage; the wedding eventually took place on 22 June 1634. It is possible that Rembrandt presented his fiancée with the (presumably framed) drawing as a form of assurance of his promise of marriage." Retrieved from https://artsandculture.google.com/asset/portrait-of-saskia-as-a-bride-rembrandt/xQFyoOfRaGb5TA on 7 December 2022.

In the early twentieth century, the American artist and painter Thomas Dewing (1851-1938) was noted for his figurative depictions of elegant and aristocratic women. In his silverpoint drawing, *Head of a girl* (1895),[14] Dewing draws a young girl in the top right corner of the sheet of buff prepared paper. The elegant girl is drawn in profile with her eyes looking slightly downward. Another traditional silverpoint artist of note is Paul Cadmus (1904-1999). In his work, *Male Nude (NM #62)* (figure 3),[15] Cadmus drew an almost horizontal nude of a young male. His feet are folded under his torso, and his arms reach the top right of the drawing. Cadmus did not try to hide the brush marks on the gesso ground, as these visible and expressive brush marks became part of the artwork. White egg tempera highlights (thin brushstrokes) were added to the silverpoint drawing to enhance the anatomy of the reclining nude male figure.

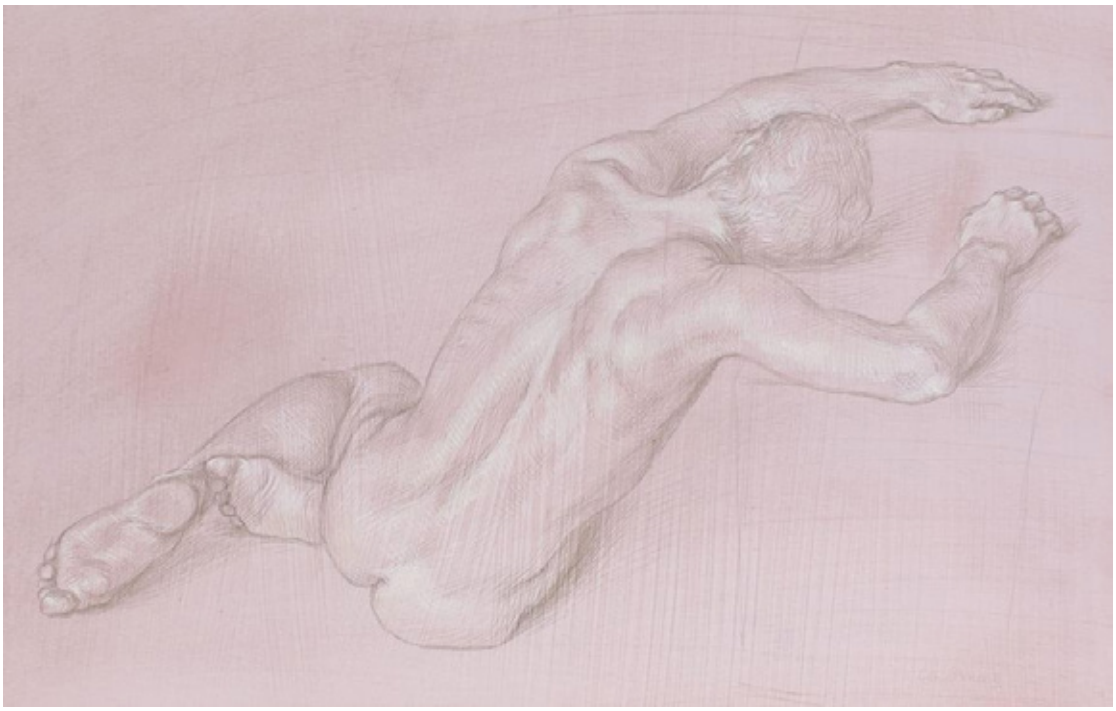

Figure 3
Paul Cadmus, *Male Nude (NM #62)*, 1968, silverpoint and egg tempera on gessoed board (retrieved from the public domain https://www.michaelrosenfeldart.com/artists/paul-cadmus-1904-1999/selected-works/2).

Metalpoint as medium

Once home from the British Museum's exhibition *Drawing in Silver and Gold: Leonardo to Jasper Johns,* I started to draw and experiment with an array of precious metals on different gessoed papers, grounds and surfaces. The newness and distinctive markings of the metalpoint medium on a properly prepared surface and textures fascinated me. Previously, I drew with charcoal, pastels and graphite pencils on cotton paper, which allows the artist to add weight, tone, contrast, and erase areas reasonably easily. But metalpoint is quite different and has several new and other challenges. Because of the hardness of the metal drawing instrument, the drawn

[14] https://www.nga.gov/features/slideshows/silver-and-gold-mod-and-contemp0.html.

[15] https://www.michaelrosenfeldart.com/artists/paul-cadmus-1904-1999/selected-works/2

lines are pretty even, and each line must be carefully considered before adding it to the gesso surface. Metal objects of different precious metals, styluses, grounds, and substrates are needed to make a metalpoint drawing.

Figure 4
After Rogier van der Weyden, *Saint Mary Magdalene*, 1450-1459,
silverpoint on ivory-primed paper, 17.6 x 13 cm, British Museum
(retrieved from the public domain https://www.wikiart.org/en/rogier-van-der-weyden/saint-mary-magdalene).

Metalpoint can undeniably be seen as a predecessor of graphite[16] and later graphite pencils. Silverpoint looks similar to graphite, but it is also vastly different. The disadvantage of silverpoint is that only one shade of tonal value can be produced despite the force applied to the stylus. Silverpoint is a very lively medium as it is the bioactive element silver deposited on the coated paper. See, for example, silverpoint drawings such as *Head of a Warrior* by Leonardo da Vinci (figure 1) and *Saint Mary Magdalene* after Rogier van der Weyden (figure 4).

Metalpoint is a reasonably vulnerable medium as the bioactive metal particles of the silver adhere through a weak electrostatic force and friction to the gesso ground because no binder

[16] Graphite is a common, natural mineral or crystallised carbon (element #6, symbol C) which is mined and shaped to use. The cores of modern pencils are made of powdered graphite that is mixed with clay and shaped in rod form. Graphite is usually dark grey in colour and is available in various degrees of hardness. Graphite is most used for writing, drawing, and sketching.

(like casein[17] gesso or Gum Tragacanth)[18] is involved. Chalk Ground Casein Gesso is a very versatile casein ground that is highly suitable for silverpoint drawing because of its rough and granular surface. Two layers of thinly applied gesso are required for paper surfaces, while wood surfaces require five layers of casein gesso. The metalpoint grounds are inherently irregular to abrade (for example, to attract dust) and very susceptible to ambient moisture because of the porous quality of the gesso ground. Subsequently, a permanent drawn mark is created on the paper. Some prepared papers react in various ways to different types of metal points, as will be discussed in the following section.

Gesso grounds

Gesso is the Italian word for a smooth mixture consisting of white mineral gypsum, chalk, and a binder like rabbit-skin glue. Traditionally it is white or off-white in colour. The ground for silverpoint drawing is prepared by coating the surface (parchment, wood, paper) with a smooth gesso mixture consisting of casein, Chinese white watercolour, or a thin size of glue (like rabbit skin glue) mixed with fine abrasive material such as bone dust. The gesso ground surface is an essential part of any metalpoint drawing because, without it, mark-making is impossible on the support. The gesso ground can be described as the foundation or primer on which creative mark-making happens. The gesso will texturise the surface slightly to accept the drawn metalpoint marks. The gesso can also be sanded to smoothen it to have a finer texture.

Recently, many pre-mixed commercial grounds have become available. These commercial primers are a combination of chalk, a binder and, in some cases, some pigment. The artist can also prepare a homemade ground by mixing white zinc pigment, bone ash, rabbit skin glue crystals and white gesso according to available gesso recipes.

In Da Vinci's time, the unique handmade grounds were made from burning bones until they became spire white (bone ash) through calcination. In Chapter 7 of Cennini's painters manual (1437) entitled *Il Libro dell'Arte*[19] (Cennini 1922: 9), he describes the ground recipe of preparing bone ash pigment (bone white)[20] in detail:

> You must know what bones are proper … take the bones of the thighs and wings of fowls or capons, and the older they are, the better … put them in the fire, and when you see they [have] become whiter than ashes, take them out, and grind them well on a porphyry slab. The chicken wing and turkey bones must be boiled to remove all the oils and connective tissue. Once thoroughly cooked, the bones must dry for roughly a month.
>
> Make a wood fire and throw the bones on the wood to be thoroughly cremated. If the bones are still black, they have not been burnt enough. The bones must be left in the fire until they turn white and fragile. Remove the calcinated bones from the ashes and ground them. Add a little water and grind them fine with a muller on a marble slab until they are mulled into a paste. Leave the mixture on the slab to dry. Once the substance is dry, it must be powdered and bottled in glass jars for later use.

[17] Casein is a "natural painting ground that has all of the same qualities as a traditional chalk ground made with whiting and rabbit skin glue." See https://www.sinopia.com/Casein-Gesso.

[18] Gum Tragacanth is a traditional binder which is used to make artist's pastels.

[19] See Lara Broecke's translation of the Cennino Cennini text.

[20] Bone ash and other types of whitings can be obtained from the ceramic equipment supplier, aardvarkclay.com.

The historical process of making homemade bone ash ground is very laborious. Cennini also outlines how the drawing surface needs to be painted with a smooth mixture of bone ash (calcium phosphate), chalk (calcium carbonate), zinc oxide pigment, mixed with 30-40 gram collagen glue, rabbit skin glue crystals, which was dissolved in water, or gum Arabic as a binding agent. The adhesive will hold all the ingredients together. Once the prepared gesso has a smooth consistency like milk, the whiting gesso can be applied to a paper of medium thickness or a wood panel to create a tactile surface (grit) to execute different metal drawings. If the gesso mixture is too thick, more water can be added and combined with a palette knife for a smooth consistency.

The pre-mixed gesso mixture can be applied with a painter's roller, painted with a broad, good-quality goat hair brush or sprayed onto the chosen surface and left to dry. The goat hair brush will transport the ground evenly over the surface and cut down on the brush strokes. Each layer is perpendicular to the last one.

The chosen surfaces may range from wooden panels or heavy-weight papers or boards, ranging between 140gsm to 350gsm in weight. The surface must first be painted in one direction, left to dry properly and then sanded to a smooth surface. Once done, the second layer of gesso must be painted in another direction. Once dry, the finished board must be sanded again to get a smooth surface for drawing on. Up to twelve layers of the whiting ground, each in a different direction, must be applied to the planned drawing surface to create the perfect base to start the metalpoint drawing. Each layer must be lightly sanded once dried before the following coat is painted. The sanding between the different coatings will remove brush lines and other strokes, becoming visible once the silverpoint drawing is started. However, the surface must not be made too smooth and shiny as the metalpoint will slip and fail to mark the surface.

These days an array of different grounds can be used, such as gesso, casein gesso, homemade grounds, pre-made grounds and commercial interior latex paint products, which are currently available, can be used. It is advisable to prepare extra sheets of grounded paper just in case one must start afresh. Pre-prepared metalpoint papers can also be obtained from certain specialist art shops.

Various other types of grounds

Substrates: wood panel

Cennini specifies that saliva and bone ash must be mixed to paint-like consistency, and the ground mixture is then spread evenly on the wood surface with a finger (1960: location 375 of 552). Once it dries, the ground will lighten, and one can start drawing. The abrasive quality of the bone ash ground causes the silver particles from the stylus to transfer onto the substrate. The wood tablets were used as temporary drawing surfaces because they are sturdy. The drawing on the wood surface can be erased by wetting a finger, rubbing it over and reapplying some ground to the surface. In Leonardo's *A study of woman's hands* (c. 1490), he draws detailed anatomical studies of hands and arms on the same sheet of pale pinkish-buff prepared paper.[21] Leonardo added charcoal lines to the darker areas and accentuated the highlights with white brushmarks.

[21] ww.rct.uk/collection/search#/4/collection/912558/a-study-of-a-womans-hands – retrieved on 10 December 2022.

Substrates: Pergamenata parchment and paper

Cennini states (1960: location 409 of 552) that the bone ash is sprinkled onto the substrate, spreading and dusting it off with a hare's foot. Over time, drawings exposed to direct sunlight will fade and tarnish. Drawing on animal parchment is the easiest because it is a rigid substrate that can handle the gradual build-up of tonal values.

Cennini explains (1960: location 391 of 552): "[Draw] so lightly that you can hardly make out what you first start to do; strengthening your strokes little by little, going back many times to produce the shadows."

The artist can experiment with techniques like regular line drawing and parallel hatching. Leonardo's hatching marks are slanted to the left because he was either left-handed or ambidextrous.[22] A right-handed person's lines will tilt to the right. The drawings of da Vinci and his master, Andrea del Verrocchio (1435-1488), are so similar in style that it is difficult to tell them apart. Verrocchio was, however, right-handed. Many of da Vinci's silverpoint drawings were studies for paintings or sculptures, such as *Rider on a rearing horse* (c. 1482)[23] and *Study for the head of a girl* (c. 1483).[24]

Pergamenata parchment is a synthetic alternative to animal parchment but has a similar translucency, weight, and durability. Silverpoint looks lighter on pergamenata, and it consequently takes more drawn lines to have an illusion of shade.

Paper is the most challenging substrate to work on because of its delicate nature. The paper may tear if the artist uses too much pressure or a very sharp wire, which will be discussed in the following section. Cennini also urged the artists to draw slowly with a lighter hand.

Drawing tools

Metalpoint drawings can be made with a wide variety of standard tools such as silverware, any flat piece of metal, a metal cake fork, electrical wire, mechanical lead holders with metal wire, a pin vice,[25] silver thimbles,[26] a brass house key, wire brushes and metallic wool pads and many other metal items. Lead and tin metalpoint tools can be bought from Zecchi in Florence, Italy. Each unique drawing tool will create different types of marks.

Each different metal, for example, silver, gold, copper, aluminium, brass, bismuth, zinc, pewter, and platinum, has a different colour. The colours of the various metals would also differ depending on whether it was drawn on a white or a black prepared ground. In Schwalb's abstract

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[22] https://www.livescience.com/65225-da-vinci-ambidextrous.html - retrieved on 11 December 2022.

[23] https://fitzmuseum.cam.ac.uk/objects-and-artworks/highlights/PD44-1999 -retrieved on 10 December 2022.

[24] https://www.leonardodavinci.net/head-of-a-girl.jsp - retrieved on 10 December 2022.

[25] A pin vice is a holding device with clamping jaws that holds the thin metal rods or wires in place by means of an adjustable chuck.

[26] See the artwork of silverpoint artist, Linda Hutchins, who draws and makes marks with different types of thimbles (https://www.facebook.com/LindaHutchinsStudio/photos/pb.100067077211440.-2207520000./259372570824359/?type=3 – retrieved 10 December 2022) and spoons on well-prepared surfaces.

and geometric drawing called *Harmonizations XVI* (2021), she draws with several different metals (aluminium, copper, brass and silverpoint) on a black gesso ground, each metal with its distinct colour.[27] By drawing with a metal stylus on a dark, prepared ground, Schwalb adds a more contemporary feeling to her artwork. Her creative use of silverpoint medium has inspired and pointed her to make a diverse range of creative artworks.

Drawings can also be made with various kinds of silver wires of different thicknesses, loaded in metalpoint styluses like a pin vice and lead holders, which hold wires of different thicknesses. These wires can be pointed and sharpened with a file or a sharpening stone to a finer point to produce a thinner line for drawing. The drawing point of the stylus can be polished with a piece of emery paper. The metal points can also be sharpened to different tip shapes, for example, a flat tip, a fine-tapered point, a bevelled point, or a round point. Each uniquely shaped tool will produce different drawing effects.

The stylus

The basic but vague instructions for making a stylus can be found in Chapter 8 of Cennini's painter's manual. Cennini (1922: 9) said, "Then take a style of silver or brass, or anything else provided the point is silver, sufficiently fine (sharp) and polished and good."[28] Any metalpoint stylus will outlast most other drawing instruments and does not constantly need sharpening like a regular pencil. Each metal has its specific lustre, be it gold, silver, nickel, brass, or copper. If the artist draws with a piece of fine wire, no sharpening of the drawing needle is needed, but one needs to be careful not to use too much pressure on the surface as the surface can be torn without difficulty. A flat piece of metal will provide a much bigger and flatter drawing mark.

To create drawings with different tonal values and line thicknesses, making three styluses with dead-soft sterling silver wire nibs is advisable.[29] Two of the styluses must be tapered like a spindle (the shape of Cennini's paintbrushes) – one stylus with a 14-gauge wire and the other with an 18-gauge wire. The third stylus must be double-ended with both gauges. The edges must be sanded to be comfortable for the artist. A hole can be drilled to fit the rod of dead-soft silver wire snugly.

The silverpoint medium allows the artist to create delicate pale-grey lines similar to graphite. Initially, most metals will look silverish. Over time, the metals will oxidise and tarnish as the metal drawing is exposed to air, light, and warm and humid weather. Each kind of metal will oxidise differently. A silverpoint drawing will eventually develop and tarnish to a warm, sepia-brown hue. Unlike other metals, gold will not tarnish. To speed up the oxidising process,

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[27] Susan Schwalb. *Harmonizations XVI* (2021). Aluminium, copper, brass and silverpoint, and black gesso on a wood panel. 76,2 x 76,2 x 5,08 cm. Retrieved from https://www.heathergaudiofineart.com/exhibitions/74-susan-schwalb-convergence-variations/video/?fbclid=IwAR3U2fFtsb4W7OlwtbLGcXigXAGStwqlONJl29lNr_3RDmcSjd6O_vXmDzg on 11 December 2022.

[28] Cennino Chapter 8 – Retrieved from https://archive.org/stream/bookofartofcenni00cennuoft/bookofartofcenni00cennuoft_djvu.txt on 12 November 2022.

[29] Dead-soft sterling silver wire refers to a very soft and malleable artistic silver wire compared to the hardened silver wire of the same type (https://www.rockseeker.com/what-is-dead-soft-silver/ - retrieved on 10 December 2022).

a fresh silverpoint drawing can be placed in a sulphur box for twenty-four hours to reinforce the tarnishing.

If the artist drew with a silver rod, the drawing would be a greyish-silver at the start. Over time it will tarnish to a golden-brown colour because of the oxidation process. The oxidation process could be brought on by lightly spraying the drawn surface with a silverpoint fixative spray. This will immediately tarnish the drawing and leave a protective varnish on the artwork. Fixatives will yellow over time unless they are marked as archival.[30] If the metalpoint drawing is framed under glass, no fixatives are required.

Silverpoint as medium

The metalpoint drawing medium is a delicate mark-making process. The medium is a long, soft silver rod or wire of different thicknesses inserted in a long solid Porte-crayon or metal stylus holder. The Porte-crayon is a metal tube that is split differently at both ends. Each side has a sliding ring that can be loosened or fastened to securely hold a silverpoint rod of different thicknesses.

Silver wires of different thicknesses can be placed inside a stylus, for example, in a Koh-I-Noor stylus or a 15cm mechanical pencil. A thin or medium wire can be inserted into a 0.9-millimetre mechanical pencil, while a thick wire can be inserted into a jeweller's vice. The metal wire rods should be shaped to a fine point to ease the drawing process. A metal sharpener is needed to sharpen the wires as they become blunt over time. A sharp drawing tool is vital for making detailed drawings. A sheet of specially coated paper is the last tool that is needed.

A pliable substance like aluminium foil can be shaped in a stylus form and used to draw marks on a coated surface.[31] However, a prepared drawing surface, coating, or slightly abrasive ground is required. Various soft metals such as gold, tin, antimony, bronze, lead, silver, copper, platinum, and bismuth can be used to make drawings. However, the most common metal used is silver.

Because metal is too hard to make marks on plain paper, a specially prepared, painted, and coated surface is required to create an image or a drawing. The artist must control the drawing pressure to avoid scratching or tearing the paper surface. Draw softly over the last lines to darken the tones.

When the artist draws with the different metal rods, traces of the gold, silver, or copper wire are deposited and inscribed onto the specially treated paper, ranging from bold sketches to more delicate, detailed drawings. See, for example, the detail from Henderson's sensitive silverpoint drawing entitled, *The Monkey Wrench Gang* (figures 5 and 8).[32]

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[30] For example, Krylon, Golden MSA and Lascaux fixative.

[31] Drawing with aluminium foil - https://www.youtube.com/watch?v=0lOvX7Q4r0U.

[32] In the video clip, Henderson shows his drawing process in making his *The Monkey Wrench Gang* silverpoint drawing - https://www.facebook.com/watch/?v=10157971283765963.

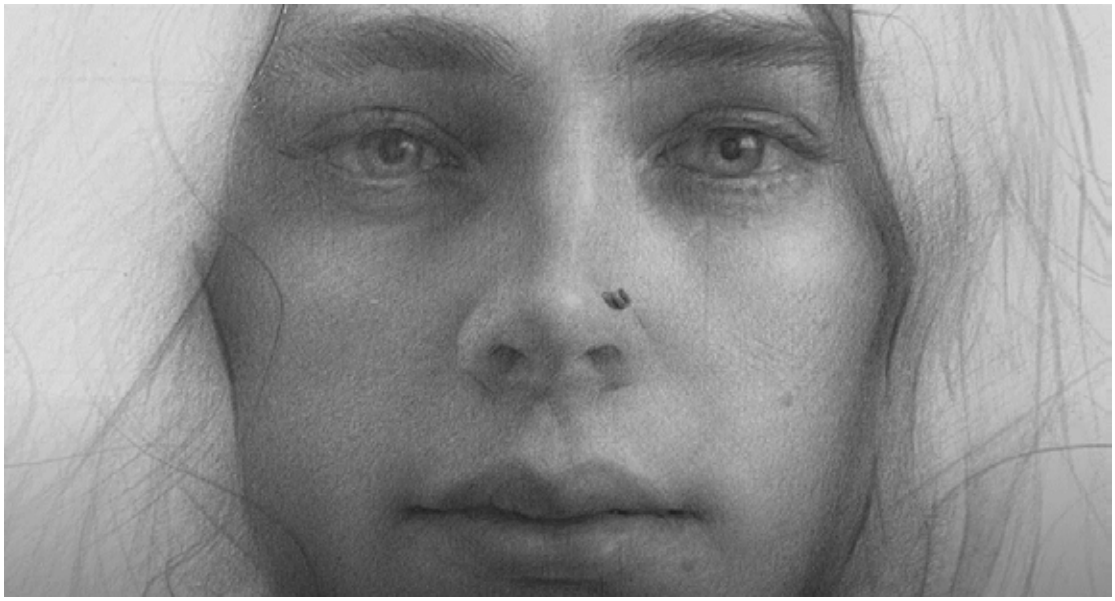

Figure 5
Joshua Henderson, *The monkey wrench gang* (detail), .999-silver and 24K-gold on Legion Art coated cover paper, 22.5 x 30 cm (retrieved from the public domain https://www.instagram.com/p/CMSvPsOnOhY/).

During the Italian Renaissance, young studio assistants were required to master the silverpoint medium to assist the artist with making drawings. Henderson (2021b) states that "it was the chosen training methodology because it is notoriously difficult to master."[33] The trainee assistant learned to draw by painstakingly copying the works of other artists. These drawings were done in sketchbooks kept and treasured in the studios and used for inspiration when working on more significant commissions. The copied drawings were thus a visual archive of figure studies, portraits, animals, and decorative motifs that could later be used by the artist and his studio. The silver stylus was frequently sharpened at both ends, one finer side and one more blunt side, to assist with the drawn line's variety, thickness, and darkness. The silverpoint technique required controlled handling of the stylus, which offered an academic discipline for the trainee artist. Once the trainee assistant was proficient in the silverpoint drawing technique, he could assist the master with more significant painting commissions.

Each metal oxides and usually darkens to a sepia or grey-brown hue over time. X-ray fluorescence tests and other technical analyses must be done to identify which specific metal was used for a drawing.

Highlights can be added to the drawing by painting certain areas or objects with white gouache or watercolour. See, for example, Mazzullo's silverpoint drawing entitled, *Three-part invention no 3 (Sliced sphere)*.[34] Mazzullo added subtle gouache highlights with a liner brush in single thin strokes to the upper part of the sphere and the sliced disc in the drawing.

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[33] Retrieved from https://legionpaper.com/blog/joshua-henderson on 11 December 2022.

[34] Tom Mazzullo. 2022. *Three-part invention no 3 (Sliced sphere)*, silverpoint and palladium point with white gouache on prepared paper, 32 x 38.1 cm. Retrieved from https://www.tommazzullo.com/news.html on 12 November 2022.

Copperpoint

Medieval and Renaissance artists also used copperpoint to make sensitive stand-alone drawings and illuminate their manuscripts. Copperpoint usually refers to a piece of pure copper (99.9%) rod or wire with differently shaped points on both ends. One side is cone-shaped, and the other has a bevelled edge to create different line thicknesses and draw effects. When a copper drawing is exposed to the atmosphere, it will oxidise and tarnish within one to two months to a brown-blackish colour.

Figure 6
Jean Fouquet (ca. 1425 - ca. 1478), *Portrait of Alain de Coëtivy*, ca. 1461, metalpoint, and a little black chalk on white prepared paper, 19.8 x 13.6 cm. Metropolitan Museum of Art. (retrieved from the public domain https://www.metmuseum.org/art/collection/search/337088).

Gold point

The nuanced metalpoint portrait, *Portrait of Alain de Coëtivy* (figure 6)**,** by Jean Fouquet, is one of the finest examples of French draftsmanship from the fifteenth century. Although Fouquet is, in essence, a painter and illuminator, he is best known for his miniatures executed in luminous colours and the indirect use of gold. Fouquet represents a strong, authoritative, and ecclesiastic man in this work. This unidentified man is placed in a three-quarter view and off-centre to the left of the drawing sheet. The portrait's placement on the left side of the sheet adds to his ecclesiastic importance and rank. He has a double chin and stares towards the emptiness in front of him (right side of the drawing sheet). An oversized, knotted scarf encircles his neck, and a tight-fitting skull cap covers his head. The sensitive and detailed drawn marks of this metalpoint drawing on white prepared paper render a monumental, ecclesiastic man. Moreover, a little black chalk accentuates essential details and adds to his cleric stature. None of the sources consulted makes it clear that the *Portrait of Alain de Coëtivy* was executed in gold point.

Technique

Drawings are traditionally two-dimensional works of art made on receptive surfaces or grounds. In the case of metalpoint, the surface is usually limited to surfaces such as paper, parchment, or wood. When the artist executes the drawing, the stylus deposits minuscule metal particles to the gesso surface, the surface of the ground must be exceptionally fine to create a mark.

Drawing in silverpoint poses several challenges for the artist as it is tough to erase or smudge the drawing. The lines cannot be erased once they have been incised. Corrections can only be made by sanding and reapplying some gesso ground to the affected area of the drawing. The artist can easily capture and preserve fine detail, textures, and minute light and flesh tones gradations using the silverpoint medium. A mistake will always be visible.

Erasing is impossible with metalpoint as a medium, as the paper needs to be explicitly prepared. When the artist draws on the prepared sheet of paper, the texture forces minuscule metal particles to be deposited on the surface. Beware of leaving fingerprints and other marks by placing a card under the drawing hand or using a bridge to support the drawing hand.

Silverpoint drawing is quite like drawing with a pencil. The transition from drawing with a pencil to silverpoint will be easier for the experienced draughtsman. The fine metal wire rods lend themselves to delicate line strokes that are layered and spaced to support the linear technique.

Henderson as a silverpoint draughtsman

By using relatively simple means, artists have trained their hands to be more skilful and creative with unusual drawing materials such as silver and gold and other precious metal rods or wires. In the online article, *Joshua Henderson reveals the secrets of silverpoint*,[35] the talented silverpoint

[35] https://legionpaper.com/blog/joshua-henderson - retrieved on 11 December 2022.

artist Joshua Henderson,[36] explains how he started using silverpoint as a drawing medium. He states that his large oil paintings "[were] an expression of sadness, trauma and mental illness, but [he] did not want to contribute more sadness to this world." Consequently, he searched for a new medium, and after attending a workshop by Steven Assael,[37] he decided to conquer silverpoint as a drawing medium. Silverpoint is not only a direct medium but also a rather challenging drawing medium that requires the diligence and patience of the draughtsman. Henderson (2021b) describes the challenges of the medium: "if not technically then psychologically, for me it's both. It's not 'eye candy' like painting, and it's not sharing space with us as sculptures do. It's a subtle medium that requires intense focus; the drawing process becomes a reflective puzzle, and I like that."

Henderson (2021b) chose silverpoint for its plainness, subtleness, and elegance. After completing Assael's comprehensive drawing and silverpoint workshop, Henderson developed his drawing skills to portray his subject matter in a sensitive, figurative, and expressive way within a specific moment. Assael (2021) believes that drawing is the starting point of painting and sculpture and an art form of its own. "It is a selective process that gives meaning and expression to a drawing that influences our skills as painters."[38]

Henderson painstakingly translates three-dimensional form onto a flat drawing surface. See, for example, his silverpoint drawings, *The last samurai* (figure 7) and *The monkey wrench gang* (figure 8). He describes his view of drawing on his Instagram page: "[it] is more than a practice, profession or hobby to me. Drawing has become my life and a way to process feeling without thought."[39]

Henderson (2021b) said he starts on a clean sheet of prepared or coated paper with each new drawing. He asks himself the following questions: What is the fundamental value of drawing, especially in our time? What is my reason and purpose for drawing? Moreover, how does my drawing contribute to the progress of the human species? Once these questions were answered, he started marking the white-prepared paper.

Henderson (2021b) states that his favourite paper is Legion Art coated cover paper[40] because it can withstand his silverpoint drawing actions. This durable coated paper has a velvety sheen

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[36] Joshua Henderson (1987-2021). Henderson completed an MFA from the New York Academy of Art in 2015. Henderson's work has been exhibited internationally in Italy, France, China, and New York and can be found in private collections in New York, Connecticut, Canada, and Texas. Henderson passed away on 24 August 2021.

[37] Steven Assael, American representational painter and draughtsman (New York City, NY 1957 -). He is seen as one of the foremost figurative artists of his generation. Steven is lecturing at the New York Academy Graduate School, New York, NY (https://www.stevenassael.com/about).

[38] https://www.stevenassael.com/about.

[39] *The thinker* drawing on Instagram page: https://www.instagram.com/p/CLZlg_uHMwQ/.

[40] Legion Art Coated Cover paper (White, 270gsm) – 100% high Alpha Cellulose, neutral pH and acid-free; buffered with calcium carbonate:
"Legion Art was created as a quality heavyweight paper with a smooth surface making it very suitable for the offset printing industry. As a result of the digital printing revolution gaining widespread popularity since the 1990s, many quality offset reproduction projects have switched to a digital process. Legion Art Coated Cover has found a new home in the Silverpoint and Metal-Point fine art medium that dates to the 15th/16th century. Legion Art features an extreme level and smooth, matte clay-coated surface, which gives it an incredibly soft velvety feel. The unique coating gives draughtsmen the ability to create fine-line drawings and spend less time preparing uncoated sheets with a necessary ground or gesso coating." (https://legionpaper.com/legion-art-coated-cover).

and allows the silver particles to build up, slowly making darker drawn areas possible. When the most significant part of the drawing is lighter, the darker areas will feel darker. When the darks are concentrated in a small drawing area, they appear darker. The unique texture of this paper allows a variety of drawn textures ranging from smooth, faint drawn lines, gradually building up in layers, to more robust drawn marks on the durable coated surface. Using different types of metals, drawing tools and mediums, the metalpoint draughtsman can enhance his drawing. A wide variety of techniques can be developed through experimentation with metalpoint as a medium. The medium does not offer a graded value scale and tonal values.

Figure 7
Joshua Henderson, *The last samurai*, .999-silver and 24K-gold on Legion Art coated cover paper, 22.5 x 30 cm (retrieved from the public domain https://www.instagram.com/p/CKHH4k1n_4T/).

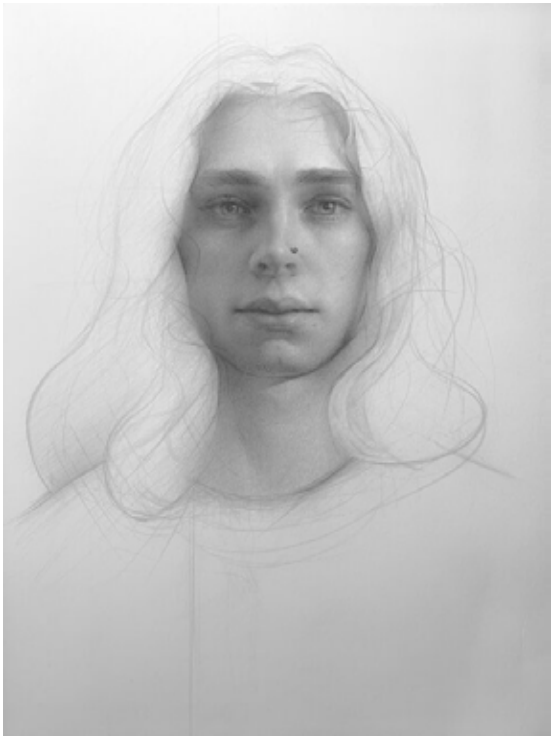

Figure 8
Joshua Henderson, *The monkey wrench gang*, .999-silver and 24K-gold on Legion Art coated cover paper, 22.5 x 30 cm (retrieved from the public domain https://www.instagram.com/p/CMSvPsOnOhY/).

- Adding closely spaced lines and an area of **hatchings** will enhance the tonal value from dark to light of the drawn object.
- the **linear direction of the lines** – individual lines can be distinguished
- using the **cross-hatching technique** will add tonal value and three dimensions to the drawn images. See, for example, Petrus Christus, *Portrait of a Young Woman,* c. 1540, Silverpoint on grey paper.[41]
- an illusion of perspective can also be created by adding diagonal lines to the drawing. See, for example, Andrea del Verrocchio's *Head of Woman* (silverpoint on paper) and Domenico

[41] Petrus Christus, Portrait of a young woman, silverpoint, framing lines with black chalk and a black ink pen, on grey prepared paper. Retrieved from https://wsimag.com/thenationalgalleryofart/artworks/117472 and https://www.boijmans.nl/en/collection/artworks/71780/portrait-of-a-young-woman on 12 November 2022,

Ghirlandaio's *Head of a man wearing a cap* (ca. 1495 – 1505). In this work, Ghirlandaio portrays the man's head in a three-quarter view while gazing at the viewer. His facial features and the contours of his hair are sensitively highlighted with white crayons on the reddish-orange prepared paper.

The darker areas of the drawing can be darkened further by drawing thin black lines with genuine Historical Carbon ink.[42] The Old Masters frequently used genuine historic ink to darken specific areas of their silverpoint drawings on the prepared paper. In *Study for the Last Supper*, 1495, Leonardo da Vinci added pen and ink highlights to his silverpoint drawing on blue prepared paper (145 x 113 mm, Graphische Sammlung Albertina, Vienna). This drawing is most likely a study for the disciple Peter. Peter's figure is painted more dynamically in *The Last Supper*.

Henderson states that silverpoint drawings have value for him "in the optimistic resilience cultivated by exercising the mind with it. I believe the fundamental value of drawing is to process ideas and emotions. To me, this means nurturing healthy mindsets. Leonardo used silverpoint to design things; I use silverpoint to design the mind."[43] Henderson stressed the importance of making mistakes, exploring, and starting afresh in his writings on the medium: "Don't worry about erasing or restarting; work through it, even if the paper tears, let your mistakes exist among your best work."[44]

In an online silverpoint/metalpoint drawing tutorial[45] by the lecturer, Jan Bustin, he mentioned that the art of drawing played an essential role in the creative process of the Flemish artist, Jan van Eyck. This is true both artistically and technically. To paint well, the artist is required to draw exceptionally well, which van Eyck achieved in his preparatory silverpoint drawing for the oil portrait painting of Cardinal Nicollò Albergati (1431).[46] The elderly Cardinal is portrayed in a near full-frontal pose, with deep lines below his eyes. He is dressed in his Cardinal's robe with a luxurious fur collar (figure 9).

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[42] In his *Il Libro dell' Arte*, Cennino Cennini describes his method of gathering carbon to make the archival Historical Carbon Ink. The ink is exclusively available at the art supply store L. Cornelissen & Son, in London. Carbon inks were made by burning materials such as tar, resin and oil to a soot consistency that contains pure carbon and oxidised materials (https://irongallink.org/iron-gall-ink-history.html#:~:text=Carbon%20ink%20preceded%20the%20use,pure%20carbon%20and%20oxidized%20materials) which were mixed with gum Arabic (ancient Egypt) or animal glue (China) to a smooth soot ink. Modern-day Carbon ink is a highly opaque and thick ink made from black pigment mixed with rainwater, oak gall ink and gum Arabic (https://londonpigment.com/products/carbon-black-ink).

[43] Retrieved from https://legionpaper.com/blog/joshua-henderson?rq=resilience%20 on 11 December 2022.

[44] Retrieved from https://legionpaper.com/blog/joshua-henderson?rq=resilience%20 on 11 December 2022.

[45] See Jan Bustin's Facebook post of 22 November 2020 and his lecture of 5 December 2020.

[46] The preparatory drawing of Cardinal Niccolò Albergati is held in the collection of the Staatliche Kunstsammlungen in Dresden, Germany.

Figure 9
Jan van Eyck, *Portrait of Cardinal Niccolò Albergati* (*Bildnis eines älteren Mannes*), silverpoint drawing, 214 x 180 mm, c. 1435/40. Staatlichen Kunstsammlungen, Kupferstich-Kabinett Dresden. (retrieved from the public domain https://en.wikipedia.org/wiki/File:Jan_van_Eyck_-_Portrait_of_Cardinal_Niccol%C3%B2_Albergati_-_Google_Art_Project.jpg).

Conclusion

Before the introduction of graphite and later graphite pencils, artists used metalpoint to execute drawings. Beautiful silverpoint drawings from the Renaissance up to the twentyfirst century inspired me to engage with these vanishing craft traditions. I have tried reconstructing the historical drawing materials and equipment and comparing them with modern-day alternatives. Silverpoint has an advantage over other traditional drawing materials in that it is not easily erased like graphite, for example, or smudge proof in comparison to chalk and pastels as a medium. Over time these delicate silverpoint drawings became a much sought-after art form worth collecting. It is of the utmost importance that dedicated silverpoint draughtsmen who try their hand at historical drawing mediums, methods and culture, be allowed to keep drawing with precious metals alive for generations to come.

Works Cited

Bean, Jacob. 1986. *Fifteenth – Eighteenth-Century French Drawings in the Metropolitan Museum of Art*. New York: Metropolitan Museum of Art.

Bustin, Jan. 2020. "Free Lecture on Van Eycks Working Methods and Materials." *Facebook.* Online at: https://www.facebook.com/jan.bustin.39/posts/1546465135540359 Accessed: 27 December 2021.

Cennini, Cennino d'Andrea. 1922. *The Book of the Art of Cennino Cennini: a Contemporary Practical Treatise on Quattrocento Painting*. London: George Allen and Unwin. Retrieved from https://archive.org/stream/bookofartofcenni00cennuoft/bookofartofcenni00cennuoft_djvu.txt on 5 December 2021.

Cennini, Cennino d'Andrea. 1960. *The Craftsman's Handbook "Il Libro dell'Arte"*, translated by Daniel V. Thompson, Jr. New York: Dover.

Guthrie, Anabeth. 2015. *Mysteries of Metalpoint Technique Revealed in a First Comprehensive Exhibition at the National Gallery of Art, Washington.* Retrieved from https://www.nga.gov/press/exh/3758.html on 4 December 2021.

Hansen, Tony. *Bone Ash*. Digitalfire.com Reference Library. Retrieved from https://digitalfire.com/4sight/material/bone_ash_123.html on 4 December 2021.

Henderson, Joshua. 2021a. "How To Draw Like A Pro: With Silverpoint". *YouTube*. Online at: https://www.youtube.com/watch?v=8arnyjYUW1c. Accessed: 15 December 2021.

Henderson, Joshua. 2021b. *Joshua Henderson Reveals the Secrets of Silverpoint*. Retrieved from: https://legionpaper.com/blog/tag/Silverpoint on 15 December 2021.

Mazzullo, Tom. 2020. *Pirate: Contemporary Art – Tom Mazzullo*. Retrieved from https://www.pirateartonline.org/tom-mazzullo on 15 December 2021.

Mazzullo, Tom. 2021. *Tom Mazzullo*. Retrieved from https://www.tommazzullo.com/ on 15 December 2021.

Schwalb, Susan and Mazzullo, Tom. 2019. *Silverpoint and Metalpoint Drawing: A Complete Guide to the Medium*. New York: Routledge.

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