MOSAIC AS AN EXPERIMENTAL SYSTEM IN CONTEMPORARY FINE ART PRACTICE AND CRITICISM

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Abstract

This thesis examines the conventional definition of mosaic and argues against the dominant narrative that subordinates it to painting. It asserts the specific character and general applicability of mosaic as a paradigm for image-construction, presenting the necessity for rethinking mosaic, in terms of both practice and theory, as a constituent presence affecting consideration of certain practices within contemporary art.

More specifically, this thesis argues that the principles of mosaic art, characterised by compositions made through the use of partible serialised units derived from an additive method of construction that is pertinent to art and technology, inform a fluid paradigmatic art category that can be traced back to antiquity and experienced through actual environments, such as in architecture, and in the virtual environments of recent digital technologies. This category is identified in the research as the *mosaical* and presents a formal set of concerns that provide a new analytical framework for particular debates on sculpture and installation art that is also relevant to art education and digital aesthetics.

The methodological approach used here combines qualitative research that draws on art-historical literature, with visual evidence extracted from artworks through the analysis of formal compositional elements. Philosophically, the study uses a Deleuzian rhizomatic approach to undermine specific art-historical hierarchies. It is also influenced by Laura Marks' concept of enfolding-unfolding aesthetics, underpinned by an understanding of how historical clues and visual evidence inform a historical horizon constituted of folds. Furthermore, it relies on a space for experimentation that bridges the divide between art and science, in keeping with Hans-Jörg Rheinberger's concepts of graphematic and representational spaces.

This practice-based PhD advances mosaic as an experimental system, conceptually and experientially, embracing the historicity of mosaic as well as its phenomenological ramifications. It proposes a new aesthetic formalism for the digital age by tracing a particular way of structuring the visual where mosaic principles enable the passage from the actual built environment to the image-based virtual environment of digital technologies. Through modernist experiments with the grid, in combination with the use of elemental units of composition, this thesis argues that the ancient tessera has evolved into the contemporary voxel.

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Preface

It seems strange that anyone might be interested in mosaic today. So much of what is currently produced tends to relate to digital technologies in one way or another, and as such mosaic art can appear strangely old-fashioned and outdated. Growing up in the 1970s and 1980s, having access to low-resolution videogames and a keen interest in history and material culture, triggered in me an unconscious interest in mosaic art and its principles, associated with the heavily pixelated images of low-resolution graphics. It is something that has remained within me my entire life and the present thesis is the latest consequence of its unfolding.

Since an early age, my approach to making has been associated with a sense of order, something that I used to think of as a neurotic behaviour or even a typological impulse: organising things in a certain way, mostly for pleasure. It was surely not a sense of filling up vacant areas in a *horror vacui* manner nor a chronic condition. I was interested in colour, and materials in general, but being an artist was out of the question for someone living in a small town in Brazil under a military dictatorship. Combined with videogames, art making was a rewarding pastime, but never considered a viable profession to pursue. For an untrained artist, collage work was the obvious outcome. My instincts connected me to an additive method of making observed in early computer graphics that remained with me and became part of my artistic identity. Actual mosaic making appeared later in life and found no resistance in my already fine-tuned mind.

During my studies of Byzantine history at the Federal University of Paraná in Curitiba, I came across Francis Fèvre's book about the life of Theodora, the Byzantine Empress. Her mosaic image on the cover of the book intrigued me. Every time I looked at it, I felt as if the image was trying to tell me something I did not know. The strong gaze of Theodora bothered me. That strange feeling only made sense a decade later when I moved to the UK to pursue my interests in classical archaeology. With an offer of a place for the MSc in Classics at The University of Edinburgh and the opportunity to participate in digs in Cyprus, I made my way to Scotland. However, I soon realised that I was not suited to digging up graves and gave up the idea of the MSc altogether. Nevertheless, for a short while I continued learning about ancient Greek language and culture for research purposes, which further connected me to the idea of creating artefacts based on ancient techniques. In a sense, I aimed at becoming an experimental archaeologist, a path that introduced me to mosaic making.

Mosaic contaminated me, taking over like a virus. Quickly, I became obsessed with it, its processes and methods. If my 'sense of order' never felt like a chronic condition, mosaic making began to do so. While in Edinburgh, I made work like an addict. Soon, the works that I produced became noticed and found their way into books and magazines, marking the starting point of my practice as an artist, which I have sustained for almost twenty years. Mosaic paved the way for my sculptural practice and, eventually, I joined the University for the Creative Arts in Canterbury for a MA in Fine Art.

During the MA, I realised that I had been using a mosaic methodology to produce works that seemed closely related to Minimalist art rather than mosaic itself. My final exhibition piece was an installation work that I came to understand as paradoxical (see fig. 7.27). How could an obvious Minimalist installation be related to mosaic? I had no answers then, which bothered me even more. So, to resolve my conflict, I decided to pursue a PhD in Art Practice in search of answers and an attempt to understand the link between an ancient methodology and contemporary fine art practices. A connection that, in my view, was present in my work all along, even in my early collage work. It was also easily observed in old computer graphics, but in educational terms, these practices were taught as disconnected and distanced. Consequently, my engagement with a practice-based PhD allowed me to reveal a narrative for mosaic art that is commonly hidden within the interstices of normative art-historical discourse. The research evidenced how principles of mosaic making are necessarily connected to the historical avant-gardes and present in the approach of the Minimalists.

Writing a coherent narrative based on enfolded events was not an easy undertaking. It required the review of a vast number of books and articles on several subjects looking for clues and implicit references, which, eventually, became the written component of the thesis. The making of artworks informed the logic of this narrative and strengthened its arguments experientially. Consequently, a coherent narrative is offered here as the written component of the PhD, but this is not necessarily the only form that the text could take.

In addition, the research contributed to the development of a method of writing and making new work exclusively derived from the process as a whole: reading, writing notes, typing, then folding the handwritten notes into separate specific units of knowledge. A way of making influenced by my contact with the writings of Gilles Deleuze and Marshall McLuhan, the ideas of the fold and the rhizome combined with the mosaic method developed as a non-visual structure for media studies.

The entire PhD process of research not only revealed an analytical framework, but also offered, through the making, reading and writing, a methodology that supported the production of a unique final 'all-encompassing' work, a rhizomatic 'text-installation' that is almost incomprehensible in objective terms, but experientially, more sensorial. It is a work that, as an artist, I understand to be my actual 'all-in-one' PhD thesis. However, my experimental text is not offered here as the main written component, which would be difficult to judge effectively in the context of the logic of a PhD. However, it has been turned into a publication in its own right titled *Enfolded Thesis*. In this way, I am also interested in probing the possible outcomes by exposing an alternative path that might lead to new unthought connections. In the appendix section, I include four texts developed concomitantly with the research exploring my analytical framework based on mosaic principles that were published between 2016 and 2018 by *Mosaïque Magazine*, a French publication specialising in contemporary mosaic art edited by Renée Antoine Malaval. The artists reviewed in these texts are Isabel Ferrand, El Anatsui, Eugenio Rivas and Maher Dawoud.

All in all, my full PhD submission is the consequence of my practice as an artist and researcher: the combination of my interest in mosaic as an experimental system in contemporary fine art practice and criticism, not only as a traditional and historical technique.

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Acknowledgements

Declaration

I declare that the research contained in this thesis, unless otherwise formally indicated within the text, is the original work of the author. The thesis has not been previously submitted to this or any other university for a degree and does not incorporate any material already submitted for a degree.
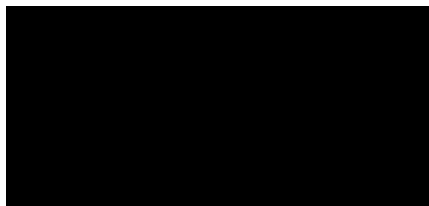
22 July 2019

Introduction

Diana's funeral was the inaugural of the pixelated planet.

(Mirzoeff, 1999:253)

Original in Colour

Fig. i.1. de Melo. Detail of *Shattered Dreams* (2004)

Nowadays, 'life takes place on screen' (ibid:1). We live in a time of fragmented iconicity, immersed in real and virtual environments and subjected to an unstoppable stream of information and an unfathomable number of images shared daily online through social media platforms. 'Seeing is not believing but interpreting' (ibid:13). Considering this digitally interconnected reality, is it possible to argue that aspects of mosaic art and its structuring principles of image making are all around us and seem to have become the norm? At first, associating an archaic mode of picturing such as mosaic to contemporary visual culture and the field of digital technologies might sound incongruous. Overall, mosaic art in its traditional embodiment is notably absent from collections of modern

and contemporary art around the world and what exists is usually relegated to the confinements of a historical practice. Is it possible that millennia of mosaic tradition have vanished from sight in contemporary visual culture? The present thesis argues otherwise.

The mosaic medium has a history that is over five thousand years old yet it has not been taught widely by degree-granting educational institutions in the UK, the USA[1] and other Western countries. Except for Italy[2] and France,[3] mosaic art and practice do not seem to be a main subject of interest. Compared with painting and sculpture, mosaic seems to occupy an insignificant position. According to Marshall McLuhan (2011 [1962]:145), a misunderstanding about 'mosaic form' both in 'art and experience' is widespread and this merits further research; for him 'the evidence is much needed.'

It is interesting that analogies to *mosaic* populate the world so vastly that we take mosaic art for granted and pay no attention to how these analogies came into existence. For instance, if the word mosaic is typed into a search engine such as Google[4] it is possible to see how semantically the word can encompass a great number of things that are loosely brought together under the generic umbrella term of *mosaic*, from web browsers to solar panels, while reference to mosaic in the world of contemporary art is, at best, limited.[5] Examples of mosaic art are rare; there are only a few institutions[6] dedicated to collecting and even fewer are investigating contemporary manifestations of mosaic work. Mosaic is considered a historical practice and is rarely part of important contemporary art collections, including those of applied art or even craft-based collections.[7] In Italy, the climate for contemporary mosaic is more favourable and tiling

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[1] In the USA, two MA dissertations have been found through this research: Brown, 1958 & Newman, 1965.

[2] *Accademia di Belle Arti di Ravenna* has a BA and a MA devoted to mosaic art within the fine art context (ABA, 2014: 1 & ABA, 2016: 1-2). Bologna, Venice and other universities in Italy offer an average of one hundred hours dedicated to mosaic within their design courses.

[3] Mosaic is taught at *École Nationale Supérieure des Beaux-Arts* in Paris and Lyon (ENSBA, 2013: 65-76).

[4] Due to a dynamic use of algorithms based on the user's activity on Google, the research results of this platform can vary considerably, and in my case, the word mosaic tends to return an expected number of results linked to artworks and artefacts that no longer shows how diversified a generic search on Google used to be.

[5] The academic study of contemporary art, the production, exhibiting and collecting of contemporary art.

[6] The Vatican Museum Contemporary Art Collection and the MAR in Ravenna are the better-known collections.

[7] In October 2015, a year after the start of this research, The *Stedelijk Museum Amsterdam* displayed *Tree* (1920) a mosaic work by Jacoba van Heemskerck alongside works by Vilmos Huszár and Mondrian. The mosaic is part of the design collection of the museum. However, it is listed under *painting*. The *Boijmans Van Beuningen Museum* in Rotterdam has mosaic works by J. T. Prikker which are not usually on display.

companies such as Bisazza[8] and Sicis[9] maintain design collections dedicated to mosaic. However, these are essentially showrooms to promote their interior design products to a growing international market.[10]

The main aim of this research is to show that mosaic art, and its principles, inform not only the domains of contemporary art, but also contemporary visual culture and digital technologies. The current state of fragmented iconicity is a direct consequence of thousands of years of mosaic practice, from Ancient Mesopotamia to the Byzantine Empire and beyond. The influence of mosaic is so deeply engrained that an interdisciplinary approach is required to reveal how it occurred. The examples are plenty and point towards a new interpretative model that this thesis articulates, as well as a new contemporary materiality where mosaic principles are a driving force.

This thesis is divided in three parts: part one, consisting of chapters one, two and three, is a contextual overview that maps out the field of investigation, provides a review of literature and reconceptualises the term mosaic for contemporary use; part two, consisting of chapters three, four and five, addresses a moment in history within which mosaic principles enfold and become a language applied to painting and are further developed three-dimensionally within sculpture by the historical avant-gardes; and, part three, comprising of chapters seven and eight, analyses contemporary practice by discussing aspects of particular works of the 1980s generation both in Britain and Brazil. It also discusses the new materiality of mosaic within digital aesthetics and presents a reflection on my own practice.

Chapter one begins with a methodological statement that outlines my creative strategic approach in relation to the analytical elements of the thesis and the propositional aspects, both in terms of new thinking through mosaic and its effects upon practice. It introduces the research question and the concept of experimental systems and how it functions in the production of knowledge through artistic research. It is a notion that places materiality and the artwork at the centre of the investigation based on ideas developed by Hans-Jörg Rheinberger. This concept of experimental systems is combined with the rhizome developed by Gilles Deleuze and Félix Guattari and the mosaic approach by McLuhan that provide an overarching methodology for the

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[8] https://www.bisazza.it (accessed 24.07.2018).

[9] http://www.sicis.com (accessed 24.07.2018).

[10] Another example of recent market interest in mosaic materials for interior decoration was the purchase of Orsoni Smalti, a Venetian company founded in the 19th century, by the Trend Group in 2003. http://www.orsoni.com (accessed 24.07.2018).

research. This chapter also provides a rationale for how the contextual material is dealt with and clarifies the historiographical path. It also discusses the relationship between the practical work and the written component of the thesis, evidencing how they operate alongside each other in the context of an experimental system of research.

Chapter two contextualises mosaic as it is conventionally understood historically. It discusses mosaic's additive method of picturing, the basis for my approach to making – a section that is illustrated by historical mosaics and contemporary works from the mosaic art scene in Ravenna, as well as my own work. This chapter proposes a re-evaluation of the notion of scale in mosaic based on the concept of point-horizon discussed by Maurice Merleau-Ponty in *Phenomenology of Perception* (2002) [1945] and explored by Alex Potts in *The Sculptural Imagination* (2000). This chapter also highlights the hierarchical issues involved in the study and analysis of mosaic work, evidencing the need for a reconceptualization based on a mosaic-centred approach that is not subservient to painting theories.

Chapter three further develops historical and methodological issues and provides a synthesis of various cognate concepts such as the grid, *kunstwollen* and modulation as well as additive synthesis and the electronic mosaic, thus enabling this thesis to produce a new concept of mosaic that operates beyond the conventional limits of its understanding. In this way, the chapter presents the concept of the *mosaical* within fine art, defending the categorical value of mosaic.

Chapter four focuses on the influences of mosaic principles in painting at the turn of the 20th century, when the tessera is repackaged for modernity by the historical avant-gardes. It is a period when mosaic becomes an experimental method in painting that subverts the naturalistic tendencies propagated by the European fine art academies, shattering the paradigm of the single-point perspective inaugurated in the Renaissance. This chapter focuses on two main geographical areas: the first is France, exploring Post-Impressionist practice and its deployment of colour theories in painting through the notion of additive synthesis. This section pays attention to three artists in particular: Georges Seurat, Paul Signac and Robert Delaunay; the second location is Russia, focusing on the influence of the Russo-Byzantine revivalism of the 19th century on the Russian avant-garde. It is an analysis based on Maria Taroutina's thesis *From the Tessera to the Square* (2013) in which she evidences how mosaic work propelled Mikhail Vrubel to knowingly reproduce tesserae in oil paint in several of his works. This section evidences how the tessera that enfolded within Vrubel's work unfolds in Kazimir

Malevich's Suprematism as architectural modular units. This experimental climate affected other parts of Europe such as Germany and the Netherlands, regions that are also visited in this chapter through an exploration of works by members of the Bauhaus and the group *De Stijl.* This section pays particular attention to the work of Johan Thorn Prikker and his connection to both Josef Albers and Piet Mondrian. In short, chapter four traces the mosaical as it enfolds and unfolds in painting within a historical horizon, highlighting the implications of mosaic for contemporary fine art practices and digital aesthetics.

Chapter five continues to trace how the Russian avant-garde explored mosaic principles and iconicity through a drive towards three-dimensionality and the sculptural form. It considers the issue of faktura and pays close attention to Vladimir Tatlin's constructive process, based on material heterogeneity, and Aleksandr Rodchenko's material homogeneity and the concept of modularity. This chapter also introduces the phenomenological dimensions of architectural mosaic and the embodied experience of viewing, which are further developed in chapter six. The final section of chapter five presents a discussion of assemblage, which focuses on the way that the material heterogeneity of mosaic icons within Tatlin's work unfolds as assemblage and acquires its own categorical value in an exhibition curated by William Seitz at the Museum of Modern Art in New York in 1961.

Chapter six explores how the concept of modularity coupled with seriality becomes the focus of attention of the sculptural debate through Minimalist practice. It discusses site-specificity and how mosaic principles influence aspects of installation art by addressing the phenomenology of viewing. This is undertaken through a comparative analysis of mosaic work and Minimalist art. This chapter concentrates on the work of Donald Judd and Carl Andre suggesting an alternative reading of their production: an experimental yet unconscious mosaic practice.

Chapter seven brings the debate up-to-date by discussing material modulation in contemporary practice and connecting it to the current drive towards digital aesthetics. It evidences the influences of mosaic on digitality and explores what can be described as an increasing rematerialisation of the pixel through traditional means and 3D-printing, as showcased in works by Daniel Rozin, JODI, Jonathan Wright and Shawn Smith, among others. In terms of material modulation, this chapter explores works by artists of the 1980s generation such as Tony Cragg, Antony Gormley and Julian Opie in Britain, and José Damasceno in Brazil. It also introduces my practice highlighting works

that connect the ancient modulation technique found in geometric Roman black-and-white mosaic floors to contemporary encoding methods such as QRs and barcodes.

Chapter eight is a reflection on my own practice developed through the articulation of the Brewery Tap gallery in Folkestone, an old pub converted into a project space. This chapter articulates how art practice can produce knowledge through research. It further develops the notion of experimental systems within my practice and evidences how continued iteration can generate unexpected results derived from the research itself and can reveal new paths for production and future conceptual avenues to explore.

As an overview of contents, it is good to note that the methodological framework and the supporting literature are not used in isolation, but can be divided into four groups: Firstly, the writings of Daniele Astrologo Abadal, Bruno Bandini, Daniele Torcellini and Renato Barilli help to locate the current debate on mosaic art, connecting it to contemporary art practices and digital aesthetics; Secondly, the writings of Paul Crowther, Gilles Deleuze, Félix Guattari, Laura U. Marks, Maurice Merleau-Ponty and Marshall McLuhan offer the philosophical framework needed for conceptualising the transhistorical importance of image making and artistic production. Their concepts help to dissolve art-historical hierarchies and evidence how ideas and materials enfold and unfold within a historical horizon; Thirdly, Philippe Bruneau, Katherine Dunbabin, Rosalind E. Krauss, Giorgio Vasari, Maria Taroutina and Meredith Hoy, among others, are employed to trace mosaic techniques and historical influences. They also enable an understanding of how mosaic has unfolded in contemporary practices and data visualisation, mapping out how the intellectual climate opened to a broader frame of reference; Lastly, the writings of Briony Fer, Miwon Kwon, Michael Schwab and Richard Sennett, among others, serve to locate my practice and provide a theoretical framework for the production and analysis of my artistic output.

PART ONE: CONTEXTUAL OVERVIEW

Chapter One: Methodology and Literature Review

The present chapter is divided in to two parts: the first part functions as a methodological statement that characterises my approach to making and provides a rationale for how the contextual material is dealt with, emphasising an approach to history influenced by the Deleuzian rhizome and the dissolution of art-historical hierarchies; the second provides a review of literature that surveys the suggestions made by some art historians and theorists regarding the transhistorical character of a mosaic method.

Preliminary Methodological Considerations

Mosaic is commonly understood as a pictorial discipline,[11] or discussed in terms of decoration and design (Bandini, 2012:84; Bowersock, 2006:3; Farneti, 1993:23). In terms of practice, it seems to be mostly a continuation and preservation of an ancient technique (ibid). Studies by Italian and French scholars have shown that mosaic has a very particular methodology, and it is not simply secondary to painting as a means of representation.[12] Nor is it merely a design feature. From this angle, mosaic is a language[13] in its own right, with a distinct formal grammar of fragmentation, modulation and repetition, reliant on an additive method of construction and composition. As such, it carries an expressive potential that exceeds its historical origins.

It can be argued that materiality is at the forefront of art production today (O'Sullivan, 2010:190; Schwab et al, 2013:108) and a reconciliation between the fine and applied arts has taken place allowing for merging and exchange between art disciplines (Moszynska, 2013:8; Barilli, 2012:40). Within this context, this thesis proposes, and argues for, the framing of mosaic language and method as a tool for understanding and reconsidering particular aspects of artworks such as image construction, composition and site-specificity, along with concomitant phenomenological relationships. Agreeing with Kubler, that art 'as a system of formal relations' has been neglected (1962:vii),

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[11] Taught under the category of painting.

[12] Such as Gespach (1881), Argan (1959), Fiorentini-Roncuzzi (1984), Bruneau (1987) and Lavagne (1988).

[13] Language here is used metaphorically in the sense of principles or a mode of structuring.

this research evidences how formal elements of mosaic composition and construction are used to create works in an Aristotelian sense, that is, as Aumont suggests (1997:234-235), by paying attention to the poetics: 'the study of the creation, the construction of works.'[14] Consequently, this research allows for an evaluation of the presence of mosaic principles in a wider context of contemporary fine art practice, extending the analytical framework to Minimalist and Post-Minimalist practices, as well as the relevance of mosaic to digital aesthetics. Within the context of my practice-based research, the main question addressed in the studio is: *How can mosaic principles offer a new framework for the analysis of spatial articulation through colour modulation in contemporary sculpture and installation art?*

My artistic practice explores the above question through experimentations involving the use of separate, or *partible*, units that can be combined with each other to form a consistent whole. Previously, my reflections on this practice have focused on the materiality of things, and how one experiment leads me to making the next. Focusing on the principles of mosaic making, and its language of fragmentation, modulation and repetition, begins to reveal aspects of colour, texture and spatiality producing those *material ideas*.[15] Through this, I have explored the relationship between my own art practice and theory, while also locating it historically and experientially evidencing the contributions of mosaic to contemporaneity. Consequently, an important concept for my practice has been *thinking through making*, which takes up the position explored in Richard Sennett's book *The Craftsman* (2008). In this, Sennett argues against the separation between 'artists as thinkers' and 'craftsmen as makers.' He emphasizes the role of *prehension*, a technical term specific to an action or movement made by the body in its anticipation of data received sensorially, which 'gives a particular cast to mental understanding as well as physical action' (Sennett, 2008:154). For instance, this encompasses knowing when a glass contains hot or cold liquid and preparing the hand instinctively before grasping it. For Sennett, prehension is an embodied mental grasp based on tacit knowledge.[16] In his critique of Hannah Arendt's contempt for *animal laborans* in her philosophy, Sennett places thinking[17] on a par with making, a

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[14] The word poetics or ποιητικῆς in ancient Greek literally means *making*.

[15] Materialised ideas through the act of making (see Fer, 2005).

[16] For Polanyi, 'tacit knowledge is more fundamental; the base on which all knowledge resides' (Kolb, 2014:187).

[17] For Merleau-Ponty 'thought does not itself suffice for recognizing things' (Langer, 1989:58).

gesture explored by Briony Fer in her essay 'The Scatter' (2005), in which she works with the concept of *thinking through making* and the idea of prehension. For her,

> [...] material process is a thought process, not a product, let alone a finished product. Conversely, thought is manifested as material. Thinking occurs through things, where material things are necessarily conditions of thought. This suggests that we do not think about things so much as through things (Fer, 2005:224).

Within my practice, the formal elements of mosaic composition and construction can be understood as a methodological tool used to produce works of art (fig. 1.1). In other words, mosaic principles function as an *experimental system*, located within a paradigmatic framework centred on mosaic introduced by Marshall McLuhan in the 1960s.[18] Furthermore, considering that this is a practice-based PhD, it is necessary to understand how art practice can produce knowledge within this context. The present research engages with concepts developed by Hans-Jörg Rheinberger around the idea of experimental systems in art and science that are indispensable: graphematic and representational spaces, and epistemic things.

Original in Colour

Fig. 1.1. de Melo. *Soft Corner* (2015)

Rheinberger's concepts in relation to art have been studied by a diverse group of practitioners including Michael Schwab who has edited a book titled *Experimental Systems Future Knowledge in Artistic Research* (2013) that analyses and engages with Rheinberger's propositions. This line of thought places art and its aesthetic value at the centre of attention and considers the *material turn* that contemporary art has taken

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[18] McLuhan's concept of mosaic is developed further within this chapter.

recently. This reasoning places making at a par with thinking very much in line with the approach advocated by Sennett (2008) and Fer (2013), as introduced above.

Art making is necessarily material production, and, for Schwab, the experimentation process proposed by Rheinberger functions as casually as shifting stuff around a room, until a novel element or procedure is discovered (Schwab, 2015:lecture). For Rheinberger,

> [...] the interaction of the experimenter with his or her material lies at the centre. If one is not immersed in, even overwhelmed by, the material, there is no creative experimentation (Schwab, 2013:198).

This experimental process takes place through the *repetition of material activity* within a space defined as graphematic, relevant to both art and science. It is a non-linguistic space of graphemes, where the traces of material activity count (ibid:208). In other words, the repetition of material activity in a studio or a lab generates new elements or unexpected things through the experimental process. Furthermore, when a new element arises in this way it is still unknown; it is simply an *epistemic thing* and in need of further analysis. The unknown novel element is scrutinised by the artist, who resolves it and eventually makes its knowledge available through an appropriate means of dissemination, defined as a representational space, a linguistic space or, as in this case, the writing of a PhD thesis. In this way, the discovered element ceases being unknown within the graphematic space and asserts its *matter-of-factness* within a cultural context. What is relevant for Rheinberger is not artistic subjectivity but the uniqueness of an artist's practice (ibid:209). Furthermore, in this sense, the establishment of a set of constraints is key to the success of an experimental system.

> [D]edication to a limited set of materials, attention to detail, continuous iterations, and the inclusion of contingent events and traces in the artistic process, allow[s] the material substrata to come to the fore as a site where traces are assembled (ibid:7).

As articulated by Rheinberger, these concepts are highly relevant to my art practice, which has been set up within certain constraints that are based on the principles of mosaic as an experimental system that 'allows for modes of artistic thinking to come to the fore that may otherwise be missed' (ibid).

In light of the above, the central research method is my own art practice, an experimental system[19] constrained by mosaic principles. It is a creative strategy where experiments take place within a graphematic space through fragmentation, inclination, modulation and repetition, an approach that pertain to a mosaic practice and are studied as principles of mosaic making. While these strategies have been occasionally alluded to within contemporary fine art, they have not been drawn together to argue for the categorical value of mosaic alongside those of sculpture, painting and installation art.[20]

For Rheinberger (Schwab, 2013:82 & 212), experimental systems have the potential to reveal submerged or enfolded narratives, fragments of older narratives and traces of unrelated narratives, which enables us to understand aspects of the history of a specific phenomenon and its boundaries. This unfolding potential has been a crucial aspect of my research; through experimental making, I uncovered the need for a historical overview to take place alongside my exploration of the broader cultural significance of the principles of mosaic making. Practical work provided a means to test the experiential and phenomenological issues pertinent to an understanding of the significance of mosaic, which, in turn, revealed an enfolded narrative or a *re-historicising of events*. The practical work has been an essential component of the research as it has pushed further the sensation of mosaic principles through the direct exploration of some of its aspects. History and philosophy alone do not allow the embodied experience that my practical work provides; they do not produce new experiential sensations and lack the matter-of-factness of an artwork. Here, history is a consequence of making and encountering a submerged narrative within the experimental system.

The concept of the rhizome, developed in Deleuze and Guattari's *A Thousand Plateaus: Capitalism and Schizophrenia* (1988), has been an essential aspect of the critical approach taken in this study. The rhizome is a visual metaphor or *image of thought* inspired by actual living rhizomes.[21] Philosophically, it is a theoretical model of knowledge that offers a non-hierarchical way of working. Within this thesis, it is used

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[19] An expanded articulation of my practice as an experimental system is provided in chapter eight, my reflection on practice per se, which is centred around my installation work produced for the Brewery Tap in Folkestone. This is presented within the last chapter due to the structure of this narrative, which is necessarily led by an historical overview.

[20] Note that these categories – painting and sculpture in particular – have themselves been problematised and analysed within an expanded field of practice.

[21] Botanic rhizomes are subterranean stem of plants such as ginger, turmeric and irises among others.

methodologically to allow visual connections and ideas to be drawn out from a disparate number of choices in a non-chronological way, both in terms of analysing art historical material throughout the text and in terms of my practice within the experimental system. The rhizome is a crucial approach for understanding mosaic in all its epistemic complexity, by informing the overall methodology of the research. It is a concept that resonates with Rheinberger, Marks, Borgdorff, among other authors, reverberating throughout this thesis.

As a model, the rhizome was conceived in response to structuralism, linguistics and disciplines that operate on *binary logic*, so dominant in Western thought (Deleuze & Guattari, 1988:5). In other words, it contests knowledge that is based on a root-tree system or *arborescent model*, an ontological model characterised by hierarchical positioning of data, or single-entry points, that reinforces dominance and control. Art History is a good example of this model; the discipline relies on, and produces, vertical, hierarchical lineages of arborescent descent and operates with a binary, European centric, view of the world. The rhizome, in contrast, is a model that operates horizontally and allows for multiple entry or exit points. It does not produce lineages like in a root-tree system but creates connections through *lines of flight*.[22]

According to Deleuze and Guattari, the rhizomatic model can also interact with root-tree systems by infiltrating and creating rhizomes with them.

> A rhizome ceaselessly establishes connections between semiotic chains, organizations[sic] of power, and circumstances relative to the arts, sciences, and social struggles (ibid:7).

The most interesting example of this in Deleuze and Guattari's text relates to the way a wasp interacts with an orchid forming a rhizome (ibid:10). However, as they point out this model has a wide appeal. In the case of artists, the rhizome seems to offer a way to overcome the 'deep-rooted' tendency to hierarchise and compartmentalise, and instead create engaging visual metaphors and horizontal connections between disparate things. In this way, the rhizomatic model of thinking provides the present research with an overarching framework that dissolves art-historical hierarchies to support new unthought connections in relation to the conceptual thinking and physical construction of mosaics, both in analytical and perceptual terms.

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[22] According to Brian Massumi, a line of flight (*fuite* in French) has a broader range of meaning covering 'not only the act of fleeing or eluding but also flowing, leaking, and disappearing into the distance […] it has no relation to flying' (Deleuze & Guattari, 1988:xvi).

To clarify how the rhizomatic model functions within my research it is useful to note that there are two distinct sides to my practical work and explain how they operate in the production of knowledge. On one hand, through my practice I produce works within an experimental system that is constrained by the principles of mosaic making and stretches the limits of its methods. This practice involves selection or preparation of the units for each artwork and putting them together according to the pertinent rules of mosaic production. This allows for the inclusion of other elements or ideas that might be revealed during the experimental process, including the interpretation and analysis of art-historical literature that inform the written component of the thesis. On the other hand, once the artworks are completed, they are shown publicly. This allows the viewer to engage with them and, consequently, have new sensations through an embodied experience. The making of new work, the historical re-evaluation triggered by the experimental system and the exposition of the works produced reveal connections between aspects of mosaic and Post-Minimalism, for instance, approaches to art-making that would not otherwise be connected or explored. In this way, my practice creates its own rhizome by drawing mosaic and Post-Minimalism together. This unique relationship begets lines of flight that further connect my practice, or experimental system, with other art traditions, concepts and submerged or fragmented narratives. In Deleuzian terms, my practice creates *multiplicities* or other rhizomes as it reveals aspects of mosaic art and the ways in which its principles emerge within the contemporary art world. As such, it undermines the hierarchical structure of Art History, generating new relations and meanings and offering a *counter-history*, an alternative narrative of Modernism consisting of other lines of development.

In addition to my experimental making based on mosaic principles and the non-hierarchical rhizomatic methodological framework supplied by Deleuze and Guattari, this thesis also draws on McLuhan's book *The Gutenberg Galaxy* (2011) [1962]. This seminal text provides with a clear overarching cultural analysis that explains the fragmentation and hierarchisation of knowledge in Western thought and as such provides an invaluable dimension to the analytical framework developed in this thesis.

According to McLuhan, alphabetic technology combined with the printing press and the serialised production of books propelled the fragmentation of thought through an emphasis on the visual sense that culminated with the private viewpoint of modern man, lineal and sequential thought in a Cartesian notion of space. This was a departure from the audile-tactile tradition of tribal man in which all senses combined and played a role in perception, production and dissemination of knowledge. In analysing the

particulars of this modern *Gutenbergian era* in contrast to our own *Electronic era*, McLuhan uses mosaic art as an actual and conceptual departure point for his theorisation of a 'mosaic pattern of perception' (McLuhan, 2011:299), which has become an influential approach to cultural analysis and writing.[23] As something of a visionary, McLuhan predicted our interconnected world, coining the phrase *the global village*. He also argued that electronic culture would see the consolidation of mosaic principles in the organisation of data visually and the restoration of an all-encompassing experience, a resurfacing of pre-modern ways of sensing.

> It has been the effort of this book [*The Gutenberg Galaxy*] to explain how the illusion of segregation of knowledge had become possible by the isolation of the visual sense by means of alphabet and typography (ibid:287).

Mapping the Field

In addition to my own practice, the inspiration for this doctoral investigation into the nature of mosaic art was provided by the writings of Daniele Astrologo Abadal, Bruno Bandini and Daniele Torcellini, who are based in Italy and are engaged with mosaic art within an academic context. Their ideas point towards a new understanding of mosaic art by placing it within the wider context of contemporary fine art practice, offering an important way of readdressing the construction and analysis of artworks regardless of traditional disciplinary categories.

In the text 'Mosaic Thought' (2012) Abadal develops the idea of thinking in mosaic terms. His argument departs from a more conventional notion of mosaic, as simply the creation of relatively flat or textured surfaces constructed in serialised separable units and arrives at the idea that mosaic principles exist conceptually and formally in broader art practices. He emphasizes mosaic as a mental activity that is not specific to the genre *mosaic* in its historical context. It is a concept

> [...] that is no longer limited to a specific genre [mosaic] developed between antiquity and the middle ages, but rather one that is open to the entire historical breadth of a heterogeneous art world (Abadal, 2012:9).

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[23] For instance, the recent publication by Betancourt & Taroutina (2015) and the writings of Barilli (2005 & 2012).

For Abadal the act of making a mosaic is concerned with the *forma mentis*.[24] Therefore, mosaic is understood as 'a process by which a structure is composed of different elements unified into an organic system' (ibid). Here mosaic is an approach, a way of configuring where the act of making is a central point. Abadal's insights are useful in understanding mosaic as a complex phenomenon that encompasses many aspects of our world, which to him is divided into optical, psychological and chemical criteria. Aligning this approach with Pointillism, where the purity of every individual colour comes together in the retina to form a whole experience, Abadal proposes that mosaic can no longer be thought in terms of art objects, but in processual terms; it requires a philosophical instead of an art-historical approach. For him, mosaic is first and foremost a conceptual phenomenon, one that incorporates countless visual forms of expression and must be understood in all its complexity. However, Abadal's idea of *an organic system* is far overreaching and places mosaic as a natural phenomenon equal to fractals, responsible for *controlled* agglomerations of pebbles on a riverbed (ibid:13), for instance. In this respect, Abadal seems to disregard the cultural use of orthogonal or other organisational principles and place mosaic as a universal organisational force.[25] Furthermore, Abadal does not address the phenomenological encounter between the viewer and the artwork, a discussion that is the focus of the present thesis and essential for the understanding of mosaic as an approach to making, and as an analytical framework that adds to the debate on sculpture and spatial practices.

Bruno Bandini's text 'Just Mosaic?' (2012) investigates the nature of mosaic as an art form and defines its current practice. Bandini argues that mosaic today is practiced in three distinct ways: 1) conservation of the technique in traditional terms such as reproduction of paintings and religious icons; 2) mass production of works including designing objects such as tables, lamps, and so on, and architectural features such as murals and surface covering works; and 3) artistic research comprised of contemporary works mainly dealing with the intrinsic qualities of mosaic composition and its internal logic.[26] For Bandini, artistic research into mosaic is comprehensive and pursued by mosaic artists and non-mosaic artists alike. He notes that this research is mostly

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[24] Forma mentis is a Latin phrase that literally means 'form of the mind'. It is used mainly in philosophy and psychology when referring to the specific way of conditioned thinking and acting, or even to a habit.

[25] In recent study, French neuroscientist Georges Chapouthier (2018) created a theoretical model for natural complexity based on mosaic principles. In his book, he describes complex systems based on the principles of juxtaposition of similar units and the integration of similar units that are combined to produce structures at a higher level. The independent units of these mosaic structures maintain a certain level of independence and autonomy; based on direct observations of living organisms.

[26] Bandini's analysis focuses on the current mosaic art scene centred in Ravenna, which also informs Torcellini's writings.

concerned with the idea of material modulation,[27] that is, working with discrete, partible units in opposition to mixing or smearing blobs of colour, and with the frequency of placement of units spatially, which can be controlled to create the formal composition of a work as well as tell a conceptual story. For Bandini, mosaic is essentially a language of fragmentation, modulation and repetition encompassing a diverse range of contemporary materials and experiences. He argues that mosaic should not just be understood as a technique, but as an approach that surpasses the limitations of the technique.

In the article 'Mosaic? Post-Mosaic? Neo-Mosaic? Non-Mosaic?' (2012), Torcellini attempts to make sense of a new wave of artists who are dealing specifically with mosaic related issues. These contemporary mosaic practitioners are a product of the two main education centres in Italy, namely the Mosaic School of Friuli in Spilimbergo and The Fine Arts Academy of Ravenna, institutions that have mosaic art at the centre of their curriculum.[28] In his article, Torcellini attempts to redefine what mosaic is and can be by setting out clear parameters for contemporary mosaic artists. He relies on formalist concepts[29] to propose that, first and foremost, these artists need to engage with analytical work to explore the material possibilities of the medium. In a later article titled 'Critical Issues' (2013), Torcellini employs the concept of *meta-modernism* to define this new wave of analytical mosaic work – a term borrowed from Robin van den Akker and Timotheus Vermeulen.[30] In Abadal's, Bandini's and Torcellini's texts the emphasis is placed on mosaic as a methodology, which indicates a shift in the way mosaic art has been studied.

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[27] The concept of modulation is taken up and developed further in chapter three.

[28] The focus of these institutions on mosaic art is a consequent of a renewed interest in mosaic that was influenced by Post-Impressionism and Italian Futurism. For instance, the Mosaic School of Friuli was founded in 1922. However, the interest in mosaic began to spread only after the Second World War, through the efforts of Gino Severini and other Italian artists and intellectuals such as Antonio Rocchi and Giulio Carlo Argan (Farneti, 1993 & Fiorentini-Roncuzzi, 1984). Severini is a key figure in this respect. He advocated mosaic making as an independent and expressive medium in Italy that culminated with the current mosaic art scene centred in Ravenna. Mapping out this new wave of mosaic artists does not take priority in my contextual review for the simple reason that Severini's approach to mosaic and his influence in Italy and France is subject of a PhD currently in development at the Prince's School of Traditional Arts in London by Lillian Sizemore. Also, writers such as Abadal, Torcellini and Bandini have been studying and analysing this contemporary production. Nonetheless, some works by this new wave of mosaic artists are included in this thesis to illustrate passages related to mosaic techniques connecting ancient, medieval and contemporary practice.

[29] Torcellini's ideas can be paralleled to modernist painting, very much in keeping with Clement Greenberg's line of thought developed in his article 'Modernist Painting' (1982). In this text, Greenberg supports the idea of experimentation in painting through analytical work that, eventually, evidences flatness as the key characteristic of the medium.

[30] www.metamodernism.com (accessed 20.02.2016).

Traditionally, in art history, mosaic is studied as a technique subservient to painting (Dunbabin, 1999:3 & Molholt, 2011:287) or discussed mainly in relation to its decorative qualities (Bowersock, 2006:3, Davies et al, 2011). In this way, and in the context of Abadal's challenge to *rethink* mosaic, questioning and readdressing mosaic's position and its contribution to contemporary fine art, opens alternative ways of framing a number of contemporary artworks and practices. The source of this line of thought can be traced back to McLuhan's work *The Gutenberg Galaxy* (1962), introduced previously, where McLuhan deploys a mosaic approach to cultural analysis. Renato Barilli in his books *L' Arte Contemporanea* (2005) [1984] and *The Science of Culture and the Phenomenology of Styles* (2012) also considers how the principles of mosaic making are far reaching and fit within the new context of the digital age, using McLuhan to form the backbone of his arguments.

In *The Science of Culture and the Phenomenology of Styles*, Barilli applies the methodological concept of homology to identify equivalences in cultural development. He expounds how the material stratum of technology connects and interacts in equal terms with the ideal stratum of symbolic forms; in his words: 'connecting the "high" stratum of the arts and sciences with the "low" stratum of technology' (Barilli, 2012:89). Barilli uses the metaphor of *connected vessels*, where an imaginary liquid [knowledge] spreads and evens out, in the process revealing aspects of innovation across distinct fields of practice. Barilli offers interesting insights in the relationship between art and technology and makes the case for the importance of mosaic principles as a contemporary mode of structuring the visual.

In art practice, it is only possible to rethink the place of mosaic within contemporary fine art since birth of that which Rosalind Krauss (1999) conceptualised as the *post-medium condition* through her analysis of Marcel Broodthaers' work as 'implod[ing] the idea of an aesthetic medium' (Krauss, 1999:20). Krauss' text and subsequent discussion of the topic, such as Alex Potts' essay 'Tactility' (2004), have provided a theoretical framework for many practitioners dealing with ideas and strategies that transcend medium specificity. Here, the concept of the post-medium condition provides a rich ground for works that might be closer related with mosaic art and its specificities, such as tactility, haptic and optic experience, fragmentation and the phenomenology of viewing, among others. Post-medium practices have their roots in the 1960s when a new panorama of art emerged, which Krauss mapped out in her seminal publication 'Sculpture in the Expanded Field' (1979). Simultaneously, there was also a shift in the way classical archaeology and history conducted research on mosaics. Mosaic works

started to become a valid source for research and cultural understanding of the Hellenisation process[31] of the Near East (Bowersock, 2006) as well as being regarded as an autonomous practice with intrinsic compositional elements (Bruneau, 1987; Fiorentini-Roncuzzi, 1984) to the extent that scholar Katherine Dunbabin (1999:330) declared 'mosaic as picture was unnatural to the medium.'

In terms of the subject of this thesis, the 1960s is a crucial decade for several reasons: it fostered McLuhan's ideas, which lead to current Italian thought on the topic of mosaic;[32] it saw a shift in historical understanding of, and archaeological approach to, mosaic and its importance; and, it witnessed an influx of diverse materials and methodologies that expunged notions of medium specificity, giving rise to a *non-medium-specific approach*, or post-medium condition, that lasts to this day (Moszynska, 2013:8). The conjunction of these factors offers solid support for this research in making it possible to think about the way in which some of the principles closely related to mosaic making have infiltrated the discourse of painting and sculpture, as well as opening up a space for medium-based mosaic practices to flourish in countries such as Italy and France.

To establish a basis for the analysis of contemporary fine art practices, this research engages with the principles of mosaic art from ancient times to the present day, in order to historically contextualise and support this analysis. Consequently, the bibliography included here encompasses works by art historians, classical archaeologists and artists. The key texts are: 'Cavallini and the Mosaic Tradition', the second chapter of Paul Hills' *The Light of Early Italian Painting* (1987), where the author discusses *optical lift-off*, a phenomenological property associated with parietal mosaic works, where the surface perceived by the viewer appears to float at a slight distance from the actual surface of the work, a reconciliation of surface and space, vestment of wall and pictorial illusion, which Hills describes as 'the key to the late antique and early medieval mosaics' (Hills, 1987:31); *Mosaics of the Greek and Roman World* (1999) by Dunbabin, a comprehensive study of mosaics spanning over a millennium in which the author defines strategies for the understanding of mosaic construction and composition; and, the *Technical-Historical Glossary of Mosaic Art* (1993) by Manuela Farneti, which offers

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[31] Hellenisation is the historical spread of ancient Greek culture over the areas conquered by Greeks or brought into their sphere of influence, particularly during the Hellenistic period following the campaigns of Alexander the Great (336-323 BC).

[32] See Abadal, Bandini, Barilli, Panzetta, Torcellini, among others.

a concise historiographical review of mosaic related literature and an impressive glossary of technical terms unifying the vocabulary for international use.

In the context of this study Giorgio Vasari is something of a pivotal figure; he offers a connecting thread from ancient mosaic methodologies to today's practices. Significantly, in his writings *On Technique* (1960) [1568], Vasari discusses mosaic works under the categories of architecture and painting. He also associates mosaics with inlay works, stained-glass windows and enamels as well as tiles and brick work. For Vasari, mosaic is at the base of all these techniques. In a way, they are all derivations of the same thing, that is they employ an additive methodology[33] of composing with discrete, partible units. In her book *The Thames and Hudson Manual of Mosaic* (1973) J. M. Haswell takes up Vasari's ideas and illustrates how the methodology of mosaic making can be found in a diverse range of objects and artefacts throughout history.

John Gage's work has also been of great importance to this research project. His books on colour offer a direct connection with the past and clear the ground for a more substantial consideration of the contribution of mosaic practices to contemporary art. For Gage mosaic works deal directly with the manipulation of light and colour through additive synthesis and on this basis, he suggests that mosaic works triggered the studies of optics carried out by Ptolemy in ancient Alexandria.[34] Gage's *Colour and Culture* (1993) takes a broad approach to colour, tracing some historical threads all the way back to antiquity. For example, his chapter 'Light from the East' offers invaluable insights into the construction of mosaic works, the most interesting being the invention of *tesserae inclination*, as well as colour associations and the *iconography of light*. He also analyses 'the appropriation of the grid by painters of the *De Stijl* movement in the Netherlands. Gage's subsequent book *Colour and Meaning* (1999) investigates colour theories with a view to attaining a unified view of colour. Here, he sets out factors that are essential for studies of colour in the visual arts and points out the ways in which practicing artists and makers necessarily engage with colour articulation and perception as well as clarifying how science and art have had a united concern for colour.

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[33] By adding material, as opposed to the subtractive method, which involves removing material.

[34] This suggestion is corroborated by A. Mark Smith the editor of *Ptolemy's Theory of Visual Perception* (1996). It is a view also shared by Kuehni, 2011.

Gage has made considerable contribution to arguments around the fallacy of notions of homogeneity in colour perception across cultures. For example, in one chapter he discusses the Meso-American colour system and uses Aztec-Mixtec mosaic masks to illustrate the fact that there was no distinction in words between the colours 'green' and 'blue'. Gage's texts explore the relationship between medieval mosaic works and theories of optical mixture, which several passages within the chapters 'The Function of the Painted Dot', 'The Point of Pointillism' and 'The Mind of the Mosaicist' link with the work of Seurat and the Neo-Impressionists. However, Gage takes a cautious approach and does not make the necessary leap to explicitly connect mosaic art with contemporary fine art practice. On this topic, most of his insights are implicit and need to be teased out from his texts. Extending Gage's insights, the article 'Mosaics Old and New' (1941) by Rudolph Arnheim offers an important discussion on how the Byzantine mode of representation through mosaic provided a material and conceptual approach to the understanding of Impressionist and Post-Impressionist movements. In this text, the relationships between the medieval past and these modern movements are made clear, explained as a dialectic change-over that occurred between Impressionism and Constructivism.

The PhD thesis *From the Tessera to the Square* (2013) by Maria Taroutina presents an alternative discourse for art and modernity based on the iconic tradition and the Russo-Byzantine revivalist movement of the 19th century. Taroutina uses mosaic, together with religious frescoes and icon-painting, to offer a compelling argument regarding the materiality of the tessera and its evolution into the painted square, as well as an exploration of the phenomenological relationship between mosaic works in situ and the viewer, which she argues shifted the terms of engagement away from those of the Renaissance painting tradition and its prioritisation of single-point perspective. Taroutina's research enables this thesis to connect mosaic art with Minimalism through the Russian avant-garde movements of the late 19th and early 20th centuries. Taroutina's thesis offers an alternative reading of Modernism and provides substantiation for my claims regarding the role of mosaics in contemporary fine art practice.

Øystein Sjåstad's *Theory of the Tache in Nineteenth-Century Painting* (2014) focuses on the French *line of flight* and in doing so provides a useful companion to Taroutina's account. Sjåstad's book connects mosaic works with painting and provides a series of cogent arguments that substantiate the influence of mosaic principles on the application of paint to canvas. The book also describes how colour mixing became a

hot topic in the intellectual circles in Paris in the mid-1880s through the writings of Charles Henry, Eugène Chevreul and Ogden Rood, which were much read by the Impressionists and Neo-Impressionists.

Enfoldment and Infinity (2010) by Laura U. Marks has been useful to this study in terms of connecting mosaic to contemporary art practices and the philosophical implications of those connections. Although Marks does not discuss mosaic art per se, only using the word mosaic in two or three passages in this book, her methodology is crucial for the analysis of mosaic in a 'pan-historical' context. Through her arguments it is possible to infer that mosaic fits in the 'in-between' layers of the visual; that is, to gain an insight into how mosaic principles are used to generate images and ideas connecting the latent to the visible, how they become a way of organising surface, generating image from computer code, or even actualising the virtual.[35] In this sense, mosaic practices offer a way of putting things together that is deeply engrained in our world, which, in fact, has been enfolding and unfolding endlessly throughout history and mostly ignored. In this way, mosaic can be understood as the manifestation of a methodology that can be called structural or *constructive* in a wider sense. Marks proposes an analytical framework called *enfolding-unfolding aesthetics*[36] that can be used to trace the manifestations of mosaic within a historical horizon. Her conceptual framework enables the creation of historical connections in a non-hierarchical manner, as if the historical continuum is made up of multiple layers of enfolded material – like a continuous membrane so tightly folded and compacted that it exposes only its unfolded visible protuberances.

> History proceeds not through ruptures but through folds: what is known at a given moment is the merest surface of enfolded events. History is so deeply enfolded, so thickly interconnected, that it makes more sense to assume historical connections between things than to deny them (Marks, 2010:26).

Consequently, it is possible to map out some incidences of mosaic art, its principles and methodology *in* and *out* of history throughout the centuries. For instance, my works *Macro News Room* (2016) (see fig. 7.23) and the *Interference Series* (2016) (see figs. 3.5 & 7.41 to 7.44) unfold visually mosaic principles hidden beneath human perceptual levels by highlighting the mosaic nature of digital images that enfolded previously within a historical horizon. In a straightforward formal level, these artworks exemplify how the

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[35] Further discussed in chapter three.

[36] Marks' framework is developed through two Western philosophical concepts –the 'fold' by Deleuze and the 'archaeology of knowledge' by Michel Foucault– in combination with Islamic thought.

concept of enfolding-unfolding aesthetics operates within my art practice and the written component of the thesis.
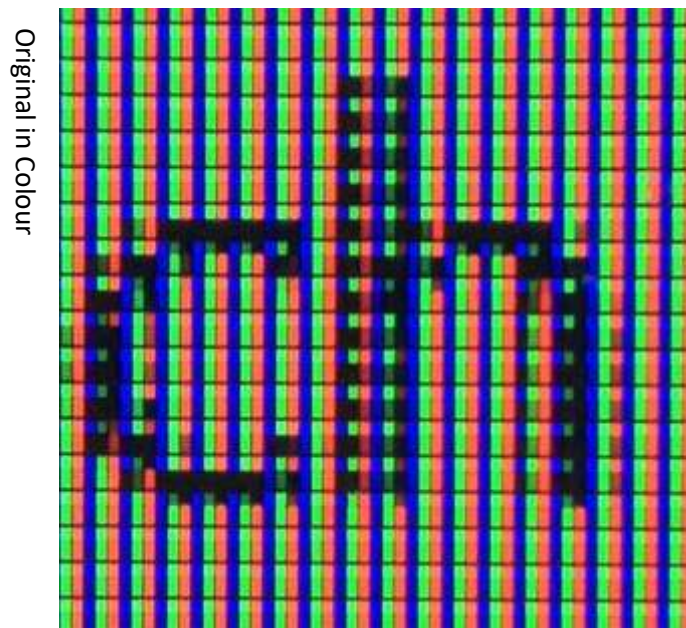

Original in Colour

Fig. 1.2. de Melo. *Individual pixels of an LCD screen* (2018)

As contemporary art is endlessly varied, deriving its influences from a vast range of styles and sources, and is undeniably impacted by a significant cultural shift propelled by 'the intangible space of the internet' (Kholeif, 2014:11), this research also extends its interest to the connection between mosaic art and digital technologies; as McLuhan notes, we live in the *Electronic era*, at 'the frontier between five centuries of mechanism and the new electronics, between the homogeneous and the simultaneous' (McLuhan, 2011:161). Therefore, this research expands to consider mosaic practices in relation to the broader context of optics, perception and phenomenology. In this sense, Marks' *Enfoldment and Infinity* offers useful insights regarding the nature of the pixel and its origins in Baghdad around the year 1000, through the Islamic philosophy of atomism. Marks creates a genealogy that connects Islamic thought with abstract art and new media art. In the same respect, Lev Manovich's PhD thesis *The Engineering of Vision from Constructivism to Computers* (1993) is relevant in that it explores models of 'vision as a code,' 'vision as a way to capture spatial information' and 'vision as information processing.' Professor Rolf Kuehni's *Color Mixture* (2011) contributes an overview of the development of the study of optics and additive synthesis from the ancient use of tesserae to LCD displays in which red, green and blue light forms a pixel (fig. 1.2). In

addition, the aforementioned books by McLuhan and Barilli are important in connecting mosaic work and Pointillism, drawing attention to their shared methodology, additive synthesis, which, in turn, enables the adoption of mosaic principles by digital technologies, as demonstrated in the electronic mosaic of data visualisation.

The book *From Point to Pixel* (2017) by Meredith Hoy[37] offers a plausible genealogy of digital aesthetics that connects the pixel to the painted dot. She articulates a definition for *digital method* that bypasses references to 'the technicalities of contemporary hardware and software' (Hoy, 2010:1). In her arguments, mosaic is mentioned under the category of artefacts as 'the antecedent form' of Pointillism and the Divisionist method of painting (Hoy, 2017:70). In support of these arguments, Hoy employs a series of case studies in which she discusses works by artists such as Paul Cézanne, Georges Seurat, Paul Klee and Victor Vasarely among others. In addition, Ernst Gombrich's books *Art and Illusion* (2000) [1960] and *The Sense of Order* (1979) are instrumental in defining analytical strategies regarding the grid and its relationship with the physiology of vision itself, as well as supporting the notion of mosaics as precursors to modern digital codes.

Maurice Merleau-Ponty's *The World of Perception* (2004) [1948], Monika M. Langer's *Merleau-Ponty's Phenomenology of Perception* (1989) and *The Sculptural Imagination* by Alex Potts (2000), alongside the aforementioned *From the Tessera to the Square* (2013) by Taroutina, provide support for the parts of this thesis that attend to the phenomenological ramifications of mosaic art, its relation to architecture, and 'the relationship between the viewer and the artwork, activating a new kind of bodily engagement with and perceptual experience of art' (Taroutina, 2013:205).

As this review of relevant literature has shown, while it is possible to locate texts that are concerned with exploring the principles of mosaic art in relation to contemporary fine art practices, accounts dealing with this *per se* are sparse. Consequently, it is specifically in this area that this research extends current knowledge and develops an analytical framework that can contribute to interest in mosaic art, its principles and practices within an academic context. This thesis is seminal in bringing together a range of concepts and contextualising contemporary mosaic practices and approaches within

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[37] Hoy's book is the publication of her PhD thesis submitted to the University of California at Berkeley in 2010.

a single text in order to provide a framework for the analysis of mosaic-related issues in contemporary practices.

In sum, this chapter has provided an overview of literature in the field occupied by this study. It has also introduced the methodologies and strategies that frame this research and clarified its function in dissolving art-historical hierarchies. This chapter has also explained the practical dimension of this research, the approach taken to the creation and development of artworks as a form of thinking through making, and the role of prehension within an experimental system constrained by the principles of mosaic art. These latter points are subject to further definition and expansion in chapter two, as part of a comprehensive account of historical notions of mosaic.

Chapter Two: Contextualising Mosaic Art

This chapter discusses the definition of mosaic as it is understood historically. It establishes the formal elements of mosaic making, such as the unit, interstices, substrates, placements, inclination and so on. This discussion is supported by illustrations throughout, comprising of a combination of historical examples and contemporary works from the art scene in Ravenna,[38] as well as examples of my own work. This chapter also proposes a re-evaluation of the notion of scale in mosaic, based on the notion of *point-horizon* adopted by Merleau-Ponty, and considers the hierarchical issues involved in the study and analysis of mosaic work, which has traditionally been subjected to theories drawn from painterly discourses. In light of this, the chapter draws attention to the need for an understanding of mosaic that goes beyond these traditional limitations and interpretative constraints.

Defining Mosaic Art

First and foremost, there is not currently a clear definition of a mosaic work. In fact, it is a contentious issue and opinions are divergent. Even locating the origins of mosaic art is a topic of heated debate that has led to much disagreement among scholars. This debate is largely fuelled by the lack of compelling evidence linking mosaic works found in Mesopotamia and Egypt to their counterparts in Ancient Greece.

According to Farneti (1993), many researchers and writers discredit Sumerian mosaic works as the 'direct forerunners' of the Classical tradition; Sumerian and Ancient Pharaonic Egyptian mosaics are seen as indigenous and not belonging to a Western tradition. Dunbabin (1999:5) states that Greek mosaic works are not influenced by the East and appeared independently in Greece, a view shared by other scholars such as Bruneau (1987) and Fischer (1971). Generally, the consensus seems to be that Greece is the birth place of mosaic art, which is largely due to the fact that archaeologists and historians can easily create hierarchical genealogies and trace mosaic tradition uninterruptedly back to the Greco-Roman world. However, while archaeological evidence suggests that the first pebble mosaics appeared in Crete during the Neolithic period (Dunbabin, 1999:5), this does not go uncontested; several scholars including Ovadiah (1980:148) argue that pebble mosaic has its origins in the East and made its

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[38] This scene is the focus of analysis among the Italian authors reviewed in chapter one.

way to Greece 'through the Persian occupation of Asia Minor in 546 BC' (Farneti, 1993:25). Nevertheless, evidence regarding the Sumerian connection remains sparse and mosaic works from that region (see figs. 2.1 & 2.8) tend to be regarded as isolated manifestations similar to Central American Aztec-Mixtec mosaic works (fig. 2.2), which are also understood to belong to a separate tradition (Anthony, 1935:32).

Original in Colour

Fig. 2.1. *The Standard of Ur* (2600-2400 BC), courtesy of the British Museum
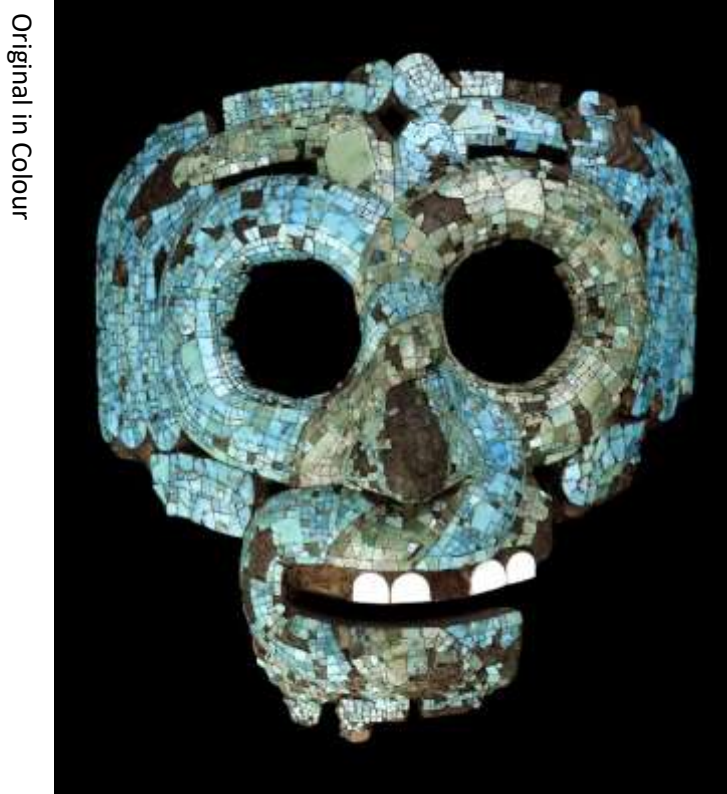
Original in Colour

Fig. 2.2. *Serpent Mask of Tlaloc* (1400-1521), courtesy of the British Museum

While the short overview of the genealogies of mosaic offered here reveals a need for further research and analysis in order to provide a historical understanding of mosaic that moves beyond disciplinary divides, this is not the concern of this thesis. In contrast to the debates around the genealogies of mosaic, the concern of this thesis is primarily to establish the parameters for a working methodology associated with partible units regardless of synchronic development. In this, the research focuses specifically on the act of placing separate units in space side by side to produce works, generate visual effects and narratives, as well as meaning and it is important to emphasise that the use of independent, serialised units had its origin within mosaic practices, in both Western or non-Western traditions whether independently developed or not.

Original in Colour

Fig. 2.3. *Bikini Girls Mosaic*, Villa Casale, Sicily (4th century)

In his book *La Mosaïque Antique* (1987) French archaeologist Philippe Bruneau gives considerable attention to the matter of independent, serialised units and defines mosaic as

> [...] the assemblage of small discrete units through the use of cement destined to constitute a flat or curved surface. The units are prepared in series, in advance, without regards to the place they come to occupy (Bruneau, 1987:9).

This definition of mosaic places considerable emphasis on the idea of interchangeability between the units *prepared in advance*, as exemplified by the magnificent 4th century mosaic of girls playing at the Villa Romana (Piazza Armerina) in Sicily (fig. 2.3). Bruneau excludes works known as *opus sectile* from the category of

mosaic.[39] In his view, *opus sectile* cannot be considered mosaic for the lack of unit interchangeability and the specificity of shapes and placement (fig. 2.4). In his book *Ancient Mosaics* (1998) Roger Ling also keeps *opus sectile* distinct from pure mosaic work.

Original in Colour

Fig. 2.4. *Tigress Attacking a Calf* (325–350 AD)

For this research, *opus sectile* is considered part of a wider cross-cultural mosaic tradition, and its method of using divisible parts *i.e.* individual units that are put together to create an image, cover a surface or add texture to a wall, is seen as relevant to the topic as a whole. The interest here in *opus sectile* lies in the homogeneity of materials used and the divisibility of units that do not necessarily need to be interchangeable from the outset. While Bruneau, Dunbabin and Ling are interested in a combination of archaeological and historical analyses of mosaic in the Greco-Roman world, this research has a broader scope and different purpose. Having said this, Dunbabin offers a definition of mosaic that is more encompassing, and useful to this study:

> A mosaic is a surface composed of discontinuous pieces, and its character reflects first and foremost the nature of the material of which it is made. The shape, size, coloration, and texture of the pieces dictate the use to which they can be put and the effect that can be created (Dunbabin, 1999:279).

For the present research, both Bruneau and Dunbabin's definitions of mosaic are important as a methodological departure point to making that informs my own practice

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[39] *Opus sectile* is a type of inlaid work made up of stone slabs of equal thickness cut into defined shapes and fitted together to form patterns by colour contrast (Haswell, 1973:42; Farneti: 1993:149).

and enables this thesis to engage with artworks that might not be considered mosaic in a traditional sense, such as Tony Cragg's plastic assemblages (1980s) (see fig. 2.26) and El Anatsui's bottle-cap sculptures (2010s) (see fig. 2.27). The notions of heterogeneous and homogeneous shapes and materials in ancient mosaic work is important in relation to notions of assemblage and modular sculptural work that are found in such contemporary examples;[40] as Farneti explains (1993:53),

> [...] the use and combination of new and different materials, typical of the latest avant-garde movements, has been a characteristic feature of mosaic art ever since antiquity.

Also, the concept of interchangeability, which Bruneau attends to, is important when it comes to the new materiality of mosaic within digital technologies as interchangeability is a crucial component in the visualisation of data.[41]

Mosaic as an Additive Method

In the context of the practice-based work developed as part of this thesis, the methodological departure point depends on a clarification of the elements of composition and construction intrinsic to mosaic art. These elements can be defined as: the unit itself, the base, the bonding agent and, consequently, the placement of units, the inclination, the spaces in-between units and the repetition derived from the act of placement. Each of these elements is clarified below, supported by a range of examples.[42]

1. The *unit* in mosaic work is called the *tessera*. Its material origins date back to the 3rd century in Greece (ibid:27). The tessera is the fundamental unit of any mosaic work. It is usually a cube made from stone, glass or, in some cases, terracotta. The word tessera has its origin in the Ancient Greek word *téssares*[43] meaning four, but it came to prominence within the Roman Empire acquiring a more specific meaning as a four-

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[40] These notions are further developed in chapters five and six.

[41] This aspect of unit interchangeability is further developed in chapter seven.

[42] Note that this section is illustrated with historical and contemporary works, including my own. The reasoning behind this choice is to showcase recent work that deals the specificities of the medium, regardless of previous contextualisation. This is in line with the thesis' ambition to present a more fluid approach to the use of examples inspired by the concept of the rhizome.

[43] In the English language the plural of the word tessera is *tesserae*.

sided shaped unit facing the viewer,[44] in other words, a square or quadrangular unit, which is technically a cube (fig. 2.5).

Original in Colour

Fig. 2.5. *Mosaic Tesserae* (6th–15th century)

Fig. 2.6. *Mosaic Cones* (c. 3500)

Original in Colour

Fig. 2.7. Policicchio. *Olga Zakharova* (2014), courtesy of the artist

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[44] *Τέσσαρες* nominative singular [*τέσσαρα* nominative plural] Ionic prose. Perseus: Greek Word Study Tool. http://www.perseus.tufts.edu (accessed 15.10.2014).

In the contemporary context, the word tessera is applied to the wide variety of shapes and materials that are used in mosaic works, from early terracotta cones (figs. 2.6 & 2.8) in Mesopotamia (c. 3500 BC) to varied fragments used by Argentinean artist Sergio Policicchio to portray *Olga Zakharova* (2014). The size of his tesserae ranges from the pictorial, photo-realistic, to the sculptural; from specks of dust to rocks (fig. 2.7).

2. The *base* of a mosaic work is known as the *substrate*. In most cases this is a prepared flat plane composed of cement-based aggregates, although in some instances a wooden base is used, the origins of which date back to the Sumerian period, in other words 'at least as early as 3500 BC' (Collins, 2015:46). The substrate can vary considerably depending on its purpose. Floors, wall, vault and portable works employ different recipes and types of construction. The earliest surviving example of a portable mosaic work is the *Standard of Ur* (2600-2400 BC), which is now on display at the British Museum in London (see fig. 2.1); and the earliest examples of architectural curved substrates are the *Cone Mosaic Columns* (3000 BC) from the Temple of Eanna in Uruk, now at the Pergamon Museum in Berlin (fig. 2.8).

Original in Colour

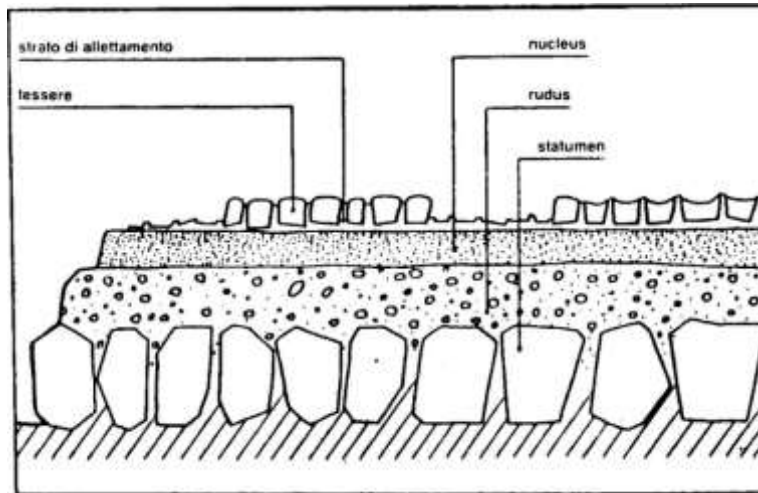Fig. 2.8. *Cone Mosaic Courtyard* (3000 BC)

Fig. 2.9. *Mosaic Floor Setting Bed* (1992) [c. 15 BC]

Original in Colour

Fig. 2.10. Ceccarossi. *Tappeto* (2011), courtesy of the artist and Luca Maggio

Technical descriptions of floor substrates can be found in ancient literature, including Pliny the Elder's *Naturalis Historiæ,* which dates back to AD 77 (Farneti, 1993:33) and Vitruvius' *De Architectura* (c. 15 BC). Such descriptions have underpinned much recent discussion and practice in terms of mosaic construction. For example, Vitruvius' description of a floor base has been illustrated (fig. 2.9) and reproduced by both Farneti (1993:128) and Ling (1998:11). On the other hand, Raffaella Ceccarossi's ephemeral *Tappeto* (2011) (fig. 2.10) is a good example of how, in contemporary mosaic practice,

the traditional approaches set out in accounts such as Vitruvius' might be tested and supplanted; in this case the fixed substrate is abolished and a transitory base is used instead.

3. The *bonding agent*, or glue, used to attach the tesserae to the substrate is usually a cement-based adhesive. This has varied considerably. For example, in Mesopotamia bitumen was used for portable works (Collins, 2015:46) while more recently, PVA based adhesives have been used with increasing frequency. Furthermore, in the same way that the solid substrate can be discarded from contemporary works, the bonding agent is also absent from some more recent mosaic pieces.

4. The *placement* of the units[45] in space, also known as *modulation*,[46] is extremely important aspect of mosaic; it gives the rhythm to a composition and dictates where and how the units are placed. The technical term for this is *andamento.* While this can be loosely compared to brushstrokes in painting, this is a rather problematic comparison as it is less dynamic than a brushstroke and more complex in positioning. Due to the nature of the tesserae as independent units, they cannot be mixed in the same way as paint pigments but must be placed side by side in a rigorous manner. There are a varied number of possible *andamenti* and the most common are *opus regulatum*,[47] *opus musivum*,[48] *opus vermiculatum*[49] and *opus paladianum*.[50] This research is specifically interested in the *opus regulatum*, which is a grid-like *andamento.* This focus allows the research to engage with discussions around Modernist painting and digital technologies and their relation to the grid as a means of organising the surface.[51]

5. Another important technical development derived from the placement of units is the invention of *tessera inclination*, which dates back to the 6th century. This advancement happened after the introduction of metallic tesserae, which are made from a

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[45] Note that a careless placement of tesserae is also a type of placement. There are examples in Byzantine mosaics where the tesserae do not follow the predetermined andamento and look sloppy. This suggests that the mosaicist simply took a handful of tessera and pushed them into the fresh plaster bed carelessly.

[46] Modulation is discussed in chapter three, as its understanding opens the discussion to include movements such as Minimalism and the 1980s generation.

[47] This is a very regular tesserae andamento in a grid pattern, like squares on a chess board.

[48] This andamento resembles ripples on a pond, with repeated rows of tesserae spreading out to fill a background.

[49] This refers to an andamento that employs tiny worm-like tesserae to mimic the chromatic effects of paintings.

[50] This andamento is commonly known as crazy paving.

[51] The idea of the grid as a means of organising the surface is developed in chapter three.

combination of glass and gold or silver leaf. As flat metallic surfaces can reflect light like a mirror, an inclination, usually a fifteen to thirty degree variation from the vertical, was added when setting tesserae to the plaster bed (Farneti, 1997:186; Teteriatnikov, 1998:57) (fig. 2.11). 'Each tessera acted as a tiny mirror reflecting light; each one reflected that light differently because, inevitably, each was set at slightly different angle (James, 2017:86). According to Farneti (1993:186), the level and depth of tesserae placement also varied. Occasionally, tesserae were also 'turned sideways to catch light from a nearby window' (*ibid*). In this way, the vast expanse of the metallic surface would be broken up, properly revealing the image to the viewer down below.[52] This practice of tesserae inclination, also known as angle or tilt, was adopted throughout the Byzantine Empire and can be seen today in monuments in Ravenna, Rome and Istanbul, among others.

> The conservators [of Hagia Sophia] noted that the outlines of the figures and haloes were executed in tesserae installed at an angle to give a sharper contour to the images as well as to reflect light (Teteriatnikov, 1998:57).
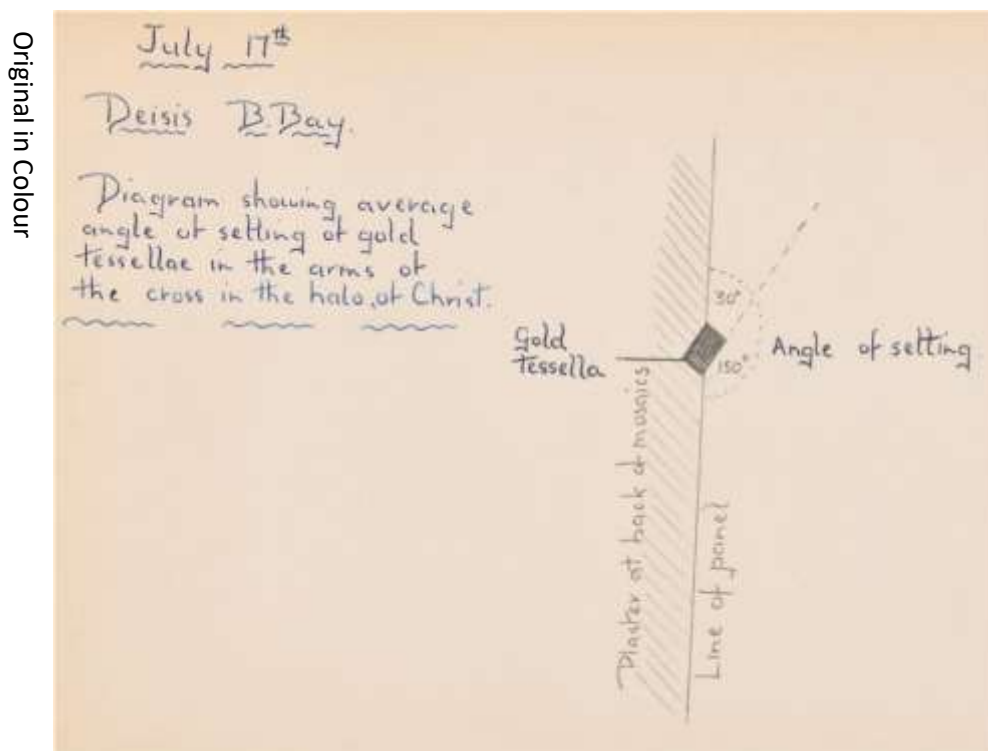
Fig. 2.11. *Tessera Inclination Sketch* (1935), Gregory, William John, The Byzantine Institute and Dumbarton Oaks Fieldwork Records and Papers, c. 1920s-2000s, Dumbarton Oaks, Trustees for Harvard University, Washington, D.C.

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[52] This is due to the nature of mosaic works in architectural settings such as churches and basilicas. In such contexts, mosaics are placed higher up on a wall or vault and not intended to be seen at body height. This generates a phenomenological property called 'optical lift-off', which is discussed in chapter six in conjunction with the work of Minimalist artist Carl Andre.

Tessera inclination is one aspect of mosaic favoured by contemporary artists experimenting with this practice and interested in its materiality. The oeuvre of the Italian trio *CaCO₃* is a good example of this (fig. 2.12). According to Torcellini,

> *CaCO₃*, with an analytical approach, emphasises this expedient [inclination], taking it to its extreme consequences [...]. The tesserae are variably set vertically, horizontally and in all the intermediate stages between these extremes [...] creating surprising effects of chiaroscuro and chromatic variations which profoundly stimulate our visual system (2015:21).
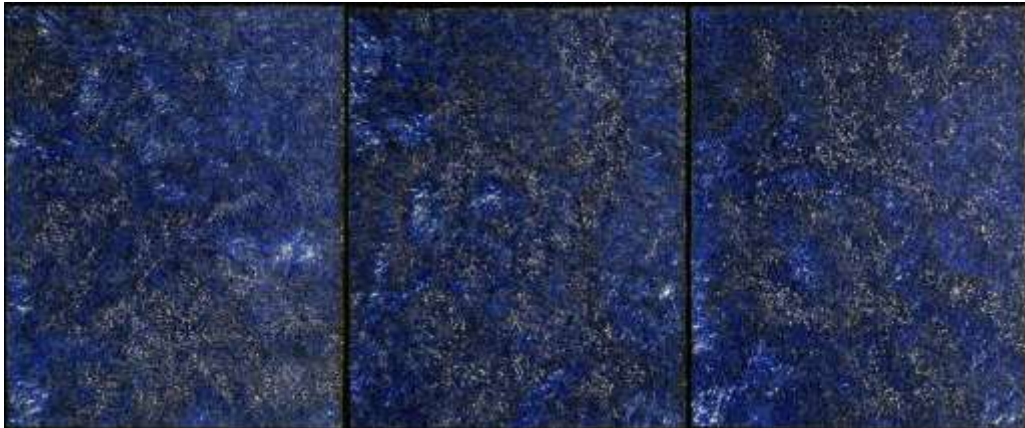

Original in Colour

Fig. 2.12. CaCO₃. *Cattedrale* (2015), courtesy of the artists

Original in Colour

Fig. 2.13. de Melo. *Inclination Plates* (2015)

My work *Inclination Plates* (2015) is another example of how inclination can be evidenced and explored artistically (fig. 2.13). My use of wooden cuboids reveals differences in structure and tone, toys with art's formal qualities and offers a conceptual narrative for colour modulation. *Inclination Plates* is arranged in a mosaic way and reverses the traditional logic of tessera inclination, which was developed for compositions with metallic glass tesserae on vertical surfaces to disperse or capture

light. Here, the units are placed horizontally in a playful manner to reveal aspect of inclination closer to the viewer. The surface is not as luminous as in glass and the units are painted, referencing the pictorial tradition of mosaic art. This work takes mosaic's principles of composition as a point of departure, while simultaneously referring to both painterly and sculptural traditions. This work also alludes to the ways in which the availability of mass-produced goods and the advent of the ready-made enabled the return of mosaic principles within a wider context of art practice.[53]

6. In mosaic work, the placement of separate units on the substrate creates spaces in-between the tesserae. These separations are called *interstices* or *fuga* and can generate interesting plays of light and shadow within a piece, or in some cases these in-between spaces can be as significant as the tesserae themselves. In 2008, Andrej Koruza, a Slovenian artist trained at the Mosaic School of Friuli in Spilimbergo, produced a series of analytical works exploring *fuga* as a formal compositional element (fig. 2.14 & 2.15).
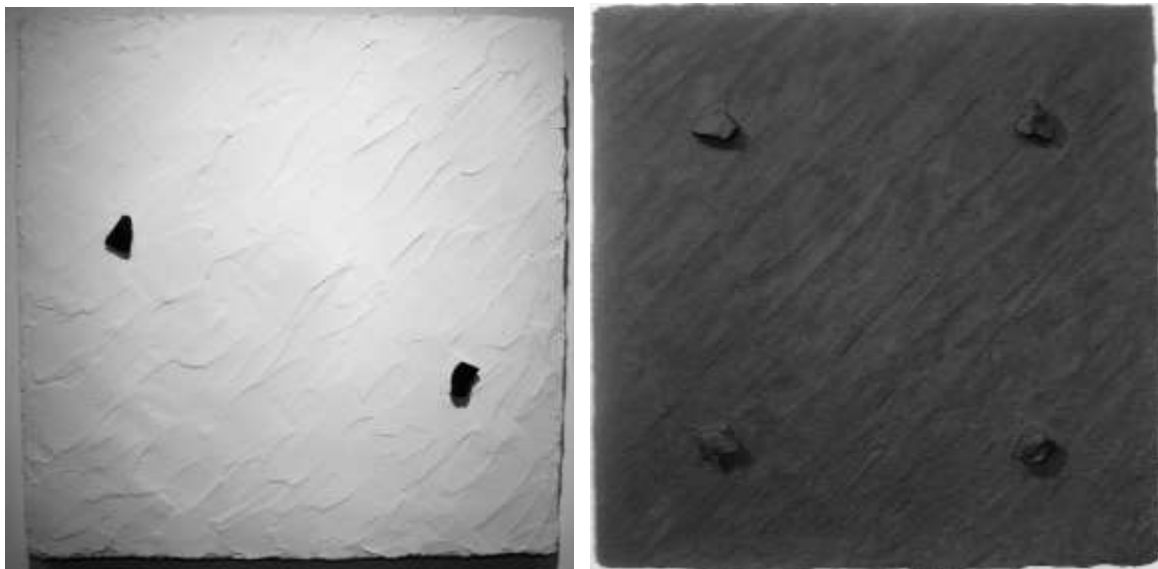

Fig. 2.14 & 2.15. Koruza. *Tessera e Fuga #1* (2008) and *Tessera e Fuga #5* (2008), courtesy of the artist and Luca Maggio

In the 2011 work *Slovenia Structured #1* (Fig. 2.16), Koruza revisits the idea of spaces in-between by deploying a series of linear metal armatures to create the illusion of cubic structures (tesserae or cuboids). This work questions the nature of the tessera itself

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[53] The ready-made, mass produced goods and seriality are further explored in chapters five, six and seven.

and addresses pictorial illusion through an experimentation with fuga.[54] This formal element of mosaic composition has also been explored in my installation *Fuga* (2015) at the Brewery Tap in Folkestone, which is discussed at length in chapter eight.

Fig. 2.16. Koruza. Detail of *Slovenia Structured #1* (2011), courtesy of the artist and Luca Maggio

7. The direct consequence of composing with separate independent units, such as takes place in mosaic work, is a *serialisation* and *repetition* of units. Whenever a vast number of units are placed side by side it will inevitably create lines of composition that are always fragmented. The fact that these units are serialised and mostly interchangeable produces repetitions of units and repetition of chromatic areas.[55] Furthermore, there is no mix of colour on the surface of the work itself. Rather, the images generated through mosaical methods are necessarily formed in the retina of the viewer and entirely dependent on this repetition of units. This aspect of the mosaic technique can be compared to the approach of the Neo-Impressionists (Arnheim, 1941; Bruneau, 1987; Gage, 1999, among others), a discussion that is taken up in chapters three and four, in connection with colour mixtures.

Establishing the elements of mosaic making and how the additive method affects composition is crucial for the development of a definition of a mosaic method that is

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[54] *Fuga* as a formal compositional element derived from mosaic making is also relevant for the analysis of some sculptural series created by Donald Judd, as discussed in chapter six.

[55] This topic is further developed in chapter six in conjunction with Minimalist practice.

valid across centuries of practice. A recognition of the formal elements and constraints of the technique has enabled this research to explore the ways in which mosaic principles function within an experimental system, and in turn this has supported the development of a new interpretative framework for the analysis of colour modulation and spatial articulation in contemporary sculptural practice. In addition to the elements set out above, the issue of scale is another pertinent aspect of mosaic that needs in depth consideration.

Scale and Mosaic

One of the issues concerning the definition of mosaic that is taken for granted and hardly debated is *scale*. Extending the discussion to include the size of the units, or the tesserae, can reveal new ways of interpreting what a mosaic work can be. Considering the size of the tessera brings attention to the relation between mosaic and touch, particularly in terms of the act of handling the units; for our 'fingers, or digits, are perhaps our most direct and intimate examples of discontinuous repeated units' (Hoy, 2017:56-57). There is also the fact that the compositional units in mosaic need to be small enough to allow them to merge optically and form a cohesive image or pattern when seen from a certain distance. It relates directly to the eye and vision itself, and a good understanding of the haptic space versus the optical is also relevant.[56] Such questions of tactility are explored in chapter three in combination with modulation.

The issue of scale is quite pertinent to shedding light on the reasons that underpin the acceptance of a surface composed of large discontinuous units as a mosaic. There is always the issue of a composition or surface pattern created with units bigger than five or ten centimetres that cannot necessarily produce a cohesive image in a pictorial sense. This depends on the distance between the viewer and such work. Additionally, if the interstices between these units are readily perceived by the viewer, it renders the image jagged and unrealistic. When such formal elements of mosaic composition are considered within an experimental practice, they can be explored in ways that extrapolate information regarding the relationship between a tessera and the human body, and its association with hand and eye coordination. Such experimentation can support the claim that, although there are general limits in terms of the relationship

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[56] Haptic and optical spaces are discussed at length in an interesting passage in *A Thousand Plateaus* (Deleuze & Guattari, 1988:492-499).

with the human body, and vision, it is plausible to accept bigger units as tesserae as well. Clearly, a revision of the issue of scale in mosaic work is needed, and the boundaries of interpretative notions made malleable, which can allow particular works by Minimalist artists to be considered within a more encompassing view of mosaic.

Considering that the proportions of contemporary sculpture have grown exponentially, the acceptable size of a tessera can be no longer restricted by tradition, it needs stretching in a similar interpretative way to accommodate monumentality. For instance, a block of steel by Richard Serra in his work *Equal* (2015) could then be understood as a tessera and not simply as a sculptural cube (fig. 2.17).[57]

Fig. 2.17. Serra. *Equal* (2015)

Monumental works by Serra and other contemporary artists such as Anish Kapoor, Christo and Ai Weiwei, make perfect sense in a context in which humanity has moved towards space exploration, from airplanes to space-shuttles, astronauts to probes. Space exploration has caused a massive perspectival change and as a consequence the human body seems to have ceased to be the measure of all things. We might now ask whether the Greek expression *panton metron anthropos*[58] has lost its currency. The iconic image of Earth as a 'pale blue dot' unveiled by Carl Sagan in 1990, which presents the Earth as smaller than a pixel, is extremely important in this context (fig. 2.18).

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[57] Serra's practice has a connection with Tatlin's work and *spatial drawing*, which, in turn, connects with the tessera via Vrubel, a 'line of flight' explored in chapters four, five and six. Also, Serra worked as an assistant to Albers during the making of *Interaction of Colour* (1963).

[58] Πάντων μέτρον ἄνθρωπος [Man is the measure of all things]. Protagoras (c. 433 BC) via Ruck, 1979.

Fig. 2.18. NASA. *Pale Blue Dot* (1990)

If we observe an aerial image of the city of São Paulo or London, these cities look very much like a mosaic work from above. It is simply a matter of positioning and distance. For landscape ecologist Richard T. T. Forman, mosaic has a scalability that pertains to all spatial scales:

> From an airplane, land almost always appears as a mosaic. The glorious mosaics of St. Mark's in Venice or the University of Mexico appear as a pattern of colours patches and strips, usually with a background matrix. Tiny stones of different colours are aggregated to create the patches, strips, and matrix. The land appears much the same. Individual trees, rocks, houses, and so forth are tiny stones. [...] In short, the individual trees, shrubs, rice plants and small buildings, analogous to the tiny stones in the artist's mosaic, are aggregated to form the pattern of patches, corridors, and matrix on land. Mosaic patterns are found at all spatial scales, from submicroscopic to the planet and universe (Forman: 1995:3-4).

In Forman's observation of the landscape, mosaic is used as a metaphor for the patterns apprehended by the aerial camera. In a sense, it relates to Abadal's notion of *mosaic thought* and his suggestion of an organic system. It is challenging to accept mosaic principles as a universal organisational force and the present thesis does not

attempt to do so.[59] However, regarding the issue of scale, Forman's passage is important as it mostly describes things that are observable as cultural interventions on the landscape such as plantations, urban conglomerations, buildings, etc. The reason these cultural patterns, which are observable from on high, are relatable to mosaic is the fact that, visually, they are associated with the constructive nature of human intervention in the landscape and resonate with a pictorial process and principles that have been used to create images since antiquity; that is, composing with partible units. In other words, mosaic principles have unfolded as data visualisation processes that is readily applied to such patterns.[60]

A new understanding of mosaic and scalability has emerged from a perspectival change, which has allowed for a shift in the way artworks are interpreted that turns to an analytical framework based on mosaic principles. For example, Merleau-Ponty's notion of scale, expressed through the concept of *point-horizon*, offers a useful approach to contemporary fine art practice. Significantly, this approach gives weight to an embodied experience in which the qualities of objects reveal themselves to a combination of senses, rather than to any one sense in isolation. In other words, for Merleau-Ponty, we do not see things with a disembodied eye positioned within a mapped out Cartesian space, which is an abstract construction. Rather, he insists that

> [...] the space we see is a realm in which we ourselves, as viewers, are situated, not something we look out at or into. We see things from our own horizon of viewing (Potts, 2000:215).

In his critique of Cartesian space, pictorial single-point perspective and science as an incomplete representation of the physical world, Merleau-Ponty opposes Hildebrand's figure-ground analysis and favours E. Husserl's concept of point-horizon.

> The word horizon emphasises the idea that the perceptual field within which things come into focus is not an objective ground but the very condition of our seeing anything. It registers the situatedness of our act of perception. Point-horizon also suggests that whatever comes to our attention is not necessarily a substantive entity, as the word figure implies. It represents one's seeing something as a process of *focussing on a point or nucleus* that makes what is situated there stand out from what lies around it and less clearly presented to us, while figure-ground could in theory refer to a visible phenomenon being differentiated from its surrounding in a more objectivising way. [...] a horizon is

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[59] See Chapouthier (2018) for a theoretical model of natural complexity based on mosaic principles.

[60] Note that mosaic principles are used in digital technologies to capture image from space. For instance, images produced by the Hubble Space Telescope are composites; the frames are 'stitched together as mosaics' (Milne, 2015:97). These digitally rendered images are the 'electronic mosaic' described by McLuhan. The topic of mosaic and digital technologies is discussed in chapters three and seven.

something that completely surrounds us, defining not only the spatial arena we can survey but also the ambient space we inhabit at a particular moment and within which we move (Potts, 2000:216-217, emphasis added).

In relation to scale, depth is direct and belongs to the world around us, not somewhere else out there disconnected from our embodied experience. We are positioned 'within the horizons of the things we catch sight of' (ibid:217). Therefore, the size of objects is dependent on our positioning within our own horizon of viewing, closer or further away from the objects we are focusing on. For Merleau-Ponty, the appearance of an object is constituted by a displacement in terms of breadth: 'it is the apparent size of [objects] [...] which, relative to their real size, assigns to them place in space' (2002:299). Size is a *relative condition* within the point-horizon concept, which allows for a reinterpretation of what can or cannot be called a tessera, regardless of its real size. For an embodied experience what matters is the relative size of an object within the horizon of viewing.

Original in Colour

Fig. 2.19. de Melo. *Red Cube on White Tessera* (2015)

My work *Red Cube on White Tessera* (2015) explores the issue of scale and takes up relevant debate on the topic within my practice (fig. 2.19). Here, a cube is placed on another cube and the title of the work reverses the expectation of the viewer in relation to a possible definition of the tessera and the sculptural cube. The red and white cubes are separate notions of an instance, and placed together in this way they raise questions about the notions of tesserae and cube. This is compounded by the naming

of the work, which isolating these geometric elements, and reverses the notion of scale in relation to commonly accepted nomenclature. In addition, the work articulates the wall in a manner that draws it in to this consideration of scale in mosaic, sculpture and the pictorial. The placement of the work provides the viewer an intimate, embodied experience within a unique architectural setting. To a certain extent, this work can also be considered an exercise in monumentality and, in overtly referencing Minimalist practices, *Red Cube on White Tessera* pays homage to Malevich's Suprematism.[61] Therefore, the work provides a relevant departure point for the investigation at the core of this research: an exploration of the unit itself.
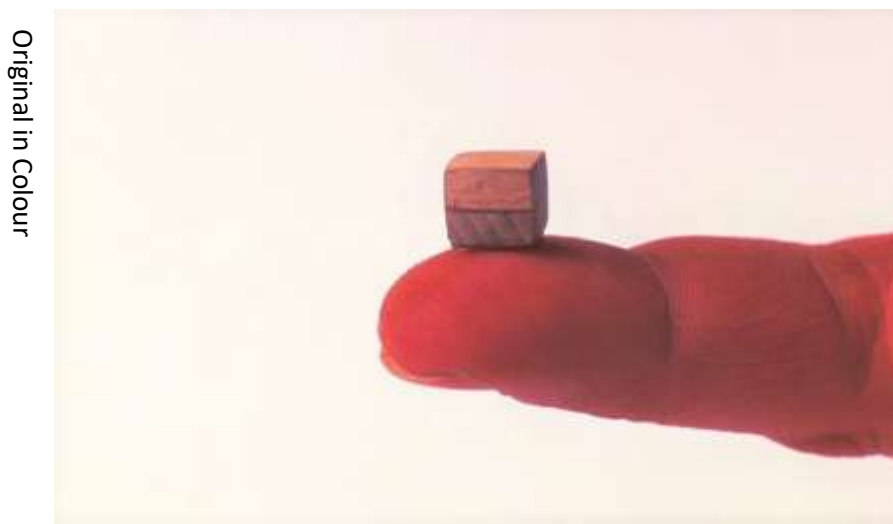

Original in Colour

Fig. 2.20. Meireles. *Southern Cross* (1970)

Like *Red Cube on White Tessera, Southern Cross* (1970) (fig. 2.20) by Brazilian artist Cildo Meireles also offers an interesting example of a possible nomenclature reversal between the tessera and the sculptural cube. It consists of a tiny nine-millimetre cube placed on the floor of a gallery, an action that invites the viewer to relate to it both physically and conceptually: in the first instance by noticing the reduced scale of the cube in relation to the vastness of the room, ideally around two-hundred square metres; and conceptually, as the cube is made of equal parts of pine and oak, material with mystic significance for the Tupi tribes in Brazil. According to Claudia Calirman (2012:116-117), the work has an explosive potential as these materials are used by the Tupi to create fire through friction. This work alludes to the misunderstanding

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[61] The influence of mosaic works on Malevich is developed in chapter four.

between the missionary Jesuits and the natives in their colonisation efforts. In the context of this research, *Southern Cross* is considered an iteration of the tessera.

In the same way that scale has been re-evaluated, the hierarchical structure to which mosaic production has been subjected, and which leads to its continued interpretation through the theories of painting, also needs careful reconsideration. In this way, mosaic has been subject to 'the kind of myopia [Walter] Benjamin describes in his distinction between vertical and horizontal forms of viewing' (Molholt, 2011:287) and, this study argues, needs to be recuperated.

Hierarchical Issues

The subjection of mosaic to a framework of analysis based on painting is a major issue. 'Scholars have tended to regard mosaics as if they were paintings or were created in emulation of painting' (ibid). In the West, after flourishing during the time of the Byzantine Empire, mosaic as an art form suffered a serious decline of status. As Molholt notes, this is not unconnected to the rise of easel painting:

> The rise of easel painting in modern culture has installed an unconscious privileging of this visual medium above all others, with the result that the conditions of viewing attending a painting hung on a wall have become normative for the arts as a whole (ibid).

In light of this, it is useful to consider a brief historical overview of the key moments of mosaic making, when the *material* and the *ideal strata* converge, in order to recuperate and bring to the fore the development of the mosaic technique and its expressive potential and symbolic value.

The first instance in which the constructive line of mosaic making (a base, or low stratum) converge with the pictorial line (its high or symbolic stratum) in the pursuit of what is understood today as art, is found in the Hellenistic period with the production of floor insertions called *emblematas* (fig. 2.21). According to Dunbabin (1999:10), prior to the Hellenistic period mosaic is not concerned with the pictorial; at this time painting is dealing with naturalism and the representation of space, mosaic works are not. According to Dunbabin, pictorial concerns such as these are 'foreign to mosaics of the late classical period' and she concludes that the *Thmuis* mosaic (200 BC) of the Hellenistic period, created by Sophilos, is an early example of a shift of attention toward the pictorial. Indeed, it is clear that this work imitates painting and is executed in fine

opus vermiculatum (ibid:25) (fig. 2.22). Dunbabin adds that the mosaics produced in Pergamon, like those from Thmuis, 'belong to the finest products of Hellenistic mosaicists: fine picture-mosaics in vermiculatum, imitating the effects of painting' (ibid:29).

Original in Colour

Fig. 2.21. *Edible Fish Emblemata* (c. 100), courtesy of the British Museum

Original in Colour

Fig. 2.22. Detail of *Thmuis Mosaic* (200 BC)

According to Arnheim (1941:71), in Hellenistic works the autonomy of the tessera that characterises mosaic making is deliberately supressed. In the attempt to imitate painting, mosaic turns to minute and tightly packed tesserae, which causes the interstices to be almost imperceptible even from a relatively close distance. By using tesserae as paint, the mosaic artist disregards the materiality of the medium and deploys it mimetically. Apart from Sophilos, the maker of the *Thmuis* mosaic, who actually signed his work, the only identifiable mosaic artist of this period is Sosos of Pergamon,[62] famous for his *Unswept Floor* mosaic, who was recorded in literature. However, despite its fame, the original *Unswept Floor* did not survive, only later copies (fig. 2.23).

Original in Colour

Fig. 2.23. *Unswept Floor* [copy] (2nd century)

The Byzantine period was a very important time for mosaic; it became the norm for artistic expression and as such was highly regarded and used to create accomplished works of art. For Arnheim, the full potential of mosaic was realised in early Christian and Byzantine art, not least because at this point the spaces in-between were a considered part of the work, which celebrated mosaic's own materiality. Arnheim suggests that there is conclusive evidence in Byzantine works of an acknowledgement that mosaic is not painting and tessera is not paint.

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[62] Sosos is mentioned in Pliny, the Elder (Dunbabin, 1999:26).

The tessera is not soft like oil-paint or clay [and] it cannot be materially fused with its equals but only placed at their side. [...] It always keeps –or should keep– something of that autonomy of shape (Arnheim, 1941:70).

Arnheim (ibid:70) points out several aspects of Byzantine mosaic that distinguish it from its precedents. For example, a move away from naturalistic representation, which involves an 'elimination of movement' and towards a flattening of the human figure, combined with 'dark contours.' Together these traits cause the destruction of painterly plasticity. Arnheim also draws attention to issues such as an increase in the size of the tessera used, from that of the Hellenistic period, and an increase in surface texture.

The technique of Byzantine mosaics detached itself as it were, from the object represented and revealed its own character to the spectator. [...] [Tesserae] are inserted freely with clearly visible intervals. Some of them project more, some less, and they are irregularly tilted against each other (Ibid:70-71).

In this way, Byzantine mosaic contemplated its full potential by addressing both its own materiality as well as pictorial concerns. In mosaic of that time the constructive and pictorial lines converge in such a way that the technicalities of the medium are preserved, adding to the symbolic value of the image. In other words, Byzantine mosaic does not simply try to imitate painting, it emphasises formal qualities of its own.

Fig. 2.24. *Empress Theodora, San Vitale* (6th century)

It is appropriate to mention here that a counternarrative regarding the visibility of individual tesserae in Byzantine mosaic is offered by Ruggero Pierantoni, in his article 'The Pixel of Theodora' (2007). In this text, Pierantoni claims that the tesserae composing the face of Empress Theodora on the apse of the basilica of San Vitale (fig. 2.24) cannot be perceived individually by a viewer standing at floor level. For him, human visual acuity is limited and does not allow such an achievement: only 'a telephoto lens' brought her face closer to us revealing its discontinuity (Pierantoni, 2007:22). Pierantoni's point may be valid in relation to this particular work. However, he seems to stand alone in his observation in relation to Byzantine mosaics as a whole and the consensus is that individual tesserae are well defined in these works. By noticing the mosaic work on the floor of the basilica and in other positions within the building, viewers, including people not necessarily familiar with the technique, would have known the image was made of a myriad of individual pieces. Mosaic works were widespread at the time, and their principles common knowledge. Most surviving examples of mosaics are floors, which allows anyone a closer material inspection.

Returning to the materiality of Byzantine mosaic, Gage (1999:84) states that '[s]everal writers of the ninth century play on the dual identity of mosaic, as material and as representation,' and explore the connection between mosaic and Ptolemy's treatise on optics.

> This is not to suggest that he [the mosaicist] either wanted, or was able, to read Ptolemy's Optics – which in any case seems to have been little known in the West between the fifth and the ninth centuries – but that both the scientist and the craftsman were exploiting a body of shared optical knowledge (ibid:82).

Another crucial moment in the development of mosaic principles in art is the *mosaical*[63] movement of the late 19th century, better known as Pointillism. Conversely, Bruneau believes that mosaic itself is pointillist:

> Disregarding the narrow sense of the word that defines the historical movement of European painting of the nineteenth century, we can say that mosaic is basically pointillist. Since, if small components are arranged so as to form a decoration, the latter is characterized by the fact that the lines and surfaces meant to be continuous are made of independent units: very different from the continuous surfaces in paintings and even the opus sectile, this discontinuity of the material appears to be the most obvious technical trait that best defines mosaic, thus explaining very well this aspect of its history, according to its practitioners who tried to camouflage it or, on the contrary, tried to use it as effect (Bruneau, 1987:11-13).

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[63] The concept of the mosaical is articulated in chapter three.

In this passage, Bruneau offers a compelling argument that mosaic work and Pointillism share a base methodology or common ground by making use of additive synthesis. While this is a valuable observation, if the underlying technical nature of mosaic and pointillist painting is taken into consideration, this statement by Bruneau should be interpreted as an anachronistic statement. To present his arguments in defence of mosaic as an independent art form, Bruneau resorts to a hierarchical view of art and uses painting to explain compositional elements of the past. By doing so, he reinforces art-historical prejudices. According to Hoy (2017:70), 'mosaic is almost universally marshalled in descriptions of pointillism.' Rather than perpetuating this bias, Pointillism should be understood as a mosaical phenomenon and not vice-versa. The mosaical unfolds by dissolving these hierarchies and reveals an alternative historical underpinning of the place of mosaic principles within other artistic forms. Torcellini (2017:45) comes closer to this understanding in an account of the way in which an interest in colour mixture led the Neo-Impressionist painters to develop mosaic principles as a language in their work. And Gage suggests that;

> [...] for mosaicists as for Neo-Impressionists, optical mixture was an aid to purity; for both, it was close to the elemental operations of nature [...] and the mosaicists chose to use it chiefly in areas where purity and luminosity were the most important aims (Gage, 1999:87).

In fact, through *kunstwollen,* or the life of forms,[64] mosaic unfolds as Pointillism and its divisionist progeny, an argument that is expanded upon in chapter four of this study.

In his text 'Seurat e il Divisionismo,' Barilli (2005) suggests that McLuhan's intuition is correct: that Seurat anticipated the television with his Pointillism. According to Barilli, through *kunstwollen,* Seurat was part of an unfolding of the mosaic technique of the Byzantine era, which fragmented the classico-Hellenistic image through the discontinuity of the varied, serialised tesserae (Barilli, 2005:44). The result is the flattening of the classical image and the creation of icons. For him, the iconic value of the image was created as a result of this shift. Furthermore, this tesseric discontinuity is a conceptual and technological tool that is now used throughout the internet and is the base of human-computer interaction. Elaborating on Barilli, it seems feasible to deduce that the iPhone icon was born in the Byzantine era. According to Barilli, mosaic-like images make more sense in an electronic era, which is dominated by complex, fluid, fragmented networks and communications, as opposed to an era reliant on the line to

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[64] *'vita delle forme'* (Barilli, 2005:44)

define the image (ibid:44). For Marks (2010:67), 'the digital screen replaced even th[e] time-based act of drawing with the mosaic-like array of pixels, converting the line to a series of samples.'[65] In the digital age, pixilation dictates image construction. In other words, mosaic principles enable the creation of such images through divisible, discrete, interchangeable units ordered according to a grid structure, the *electronic mosaic*.[66] In this way, hierarchically, mosaic seems prevalent once again. However, current conceptual analytical frameworks have not re-evaluated the position of mosaic in contemporary visual culture.

The manifestation of mosaic principles in the 19th century, identified by Bruneau, finds a parallel in Russia. As mentioned in chapter one, Taroutina's PhD thesis offers a compelling argument connecting mosaic art and painting through the work of Mikhail Vrubel (1856-1910), which had considerable influence on the Russian avant-garde. According to Taroutina, Vrubel deliberately reproduced 'mosaic tesserae in oil paint in several of his works' and, by doing so

> [he] emphasized the material quality of the paint and the flatness of the canvas, creating a characteristically Modernist pictorial structure reminiscent of Paul Cézanne (Taroutina, 2013:10).

The revival of the Russo-Byzantine tradition in the 19th century provided artists with 'an alternative to the naturalism propagated by European academies and an alternative to French Modernism' (ibid:12). Consequently, it is possible to understand how mosaic principles left their mark in Russian Modernism and gave rise to Constructivism and abstraction. Taroutina uses just such an understanding to link Vrubel's *The Demon Seated* (1890) to Malevich's *Black Square* [1915] and Tatlin's *Corner Counter-Relief*s [1915]' (ibid). This argument is developed further in relation to painting in chapter four, and in relation to sculpture in chapter five.

Another connection between mosaic principles, modern art and digital technologies, relevant for reinstating the value of mosaic within contemporary fine art and breaking down hierarchical bias, is the Islamic route. According to Marks (2010:113), the inception of modern art in Europe favouring the exploration of colour to the detriment

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[65] At the end of the 19th century, the *colour over line debate* is carried out by the colourists versus the linearists, an issue that goes back to the *Cinquecento* in Italy between the Venetian and the Florentine styles of painting. Ernst Gombrich suggests that the Venetian school defended colour over line due to its connections with Constantinople and its 'craftsmen in mosaic'. (Gombrich, 1995 [1950]:325).

[66] The 'electronic mosaic' is further explored in chapters three and seven.

of line,[67] which eventually leads art to abstractionism, has an unequivocal connection with Islamic art, which had its roots within the Byzantine tradition.

Islamic art has its birth during an iconoclastic phase of the Byzantine Empire, which occurred under Emperor Maurice's rule (582-602). Mosaic was then the most regarded idiom for artistic expression. At this time the Islamic tradition adopted a kind of abstractionism as a norm, known as *aniconism*,[68] which Marks describes as 'the visual culture into which Islam arrived in 632' (Marks, 2010:52). Early Islamic monuments were built by Christian builders and craftspeople, which as Marks notes had a significant impact:

> Decoration of the earliest Islamic monuments, the Dome of the Rock and the Great Mosque of Damascus, borrowed the style of mosaics in Christian churches in Palestine, removing the human figures and leaving buildings, trees and ornaments (ibid:302).

Original in Colour

Fig. 2.25. Farmanfarmaian. *Convertible Series*, group four (2010)

Mosaic with its intrinsic pattern making potential became a well-established and revered idiom in the Islamic World, a fact that is still in evidence. The work of Iranian artist Monir Shahroudy Farmanfarmaian is a good example of this. In 2015, she had

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[67] See footnote 65 related to the debate of *colour over line*.
[68] Note that 'aniconism is not iconoclasm' and it is also present in Judaism (Marks, 2010:52-53).

her first comprehensive exhibition in the USA at the Guggenheim Museum in New York. The artist presented a series of mirror mosaics (fig. 2.25) and drawings (1974–2014) inspired by the Shah Cheragh Mosque in Shiraz, referencing 'Persian architectural and decorative tradition, the mathematical basis of geometric forms in Islamic pattern, and Sufi cosmology' (Guggenheim, 2015:1). What is peculiar about the official press release of Farmanfarmaian's *Infinite Possibility* exhibition is the fact that the word mosaic is not mentioned in the text. It seems as if the word was avoided intentionally, suggesting a certain level of prejudice or lack of knowledge about the importance of mosaic in Islamic art.[69]

According to Marks, while the Islamic tradition was submerged and dismissed for centuries, it influenced the West through a process of enfolding and unfolding. Marks recovers the Islamic influence by connecting its thought with the philosophy of Deleuze and argues that 'contemporary algorithmic thought and art spring (in part) from an ignored and once-despised "source": the Islamic world and its merely decorative-seeming art' (Marks, 2010:25). This line of flight serves as an example of how mosaic principles are still very much relevant and part of contemporary visual culture. As the Islamic tradition and its relevance to contemporary culture is discussed at length by Marks, that topic does not take priority in this thesis.

In summary, this overview has served to locate, within a historical horizon, some of the moments when there has been a clear convergence between the technical and symbolic aspects of mosaic. This section has shed light on the hierarchical positioning of painting and mosaic, and shown how the terminology seems to favour painting as an analytical departure point, reinforcing its supposed higher symbolic status. Recognising the existence of these terminological prejudices, this thesis strives to reinstate a mosaic-related nomenclature by bringing the notion of the mosaical to bear on contemporary art.

Composing with Partible Units

The relevance of the material presented in this chapter lies in the fact that composing with partible units triggers a whole range of possibilities when it comes to the

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[69] Note that *mosaic* is mention in later texts related to Farmanfarmaian's work found on the blog session of the website of the Guggenheim Museum. See: Suarez, 2015 [April] & Jakubowska-Cook, 2015 [May]. The press released is dated 30 January 2015.

development and production of artworks, permanent or transient, site-specific or not. The thesis sets out the parameters for a formalist approach to the study of mosaic art, and reinstates the value of mosaic within contemporary art as well as supporting arguments for the application of mosaic principles to the development and production of artworks.

Works composed using the elements of mosaic making can shed light on a range of issues, including colour modulation and interaction, additive synthesis in image composition, spatial articulation and the concomitant phenomenological experience of such. Recognition of this opens up a space for redefining what a mosaic is and what it can be, for considering the uniqueness of its method and exploring the ways in which it might be expanded and articulated within contemporary art practices, in terms of both analysis and production. It is interesting here to recall Abadal's idea of *mosaic thought*: that is, the conceptual and formal presence of mosaic principles in broader art practices, their existence beyond a specific medium. The arguments presented in this thesis further develop these ideas, placing mosaic not only within the domain of art but technology itself, and offering a fundamental methodological framework to digital technologies and their virtual environments, which are now the norm for manifesting the visual in our interconnected world; a topic that is expanded upon in chapter three.

Abadal's ideas alongside Barilli's, influenced by McLuhan, are formulated through their engagement with art history of the 20th century and can be traced back to Modernist practices and the systematisation of compositional and constructive methods. Through this, both authors offer invaluable insights regarding the connection between mosaic art principles and 21st century art practices, and the extension of these principles to technology. The Bauhaus was the first art school to systematise the fundaments of composition, departing from the idea of basic units and the grid as structuring elements, highlighting the value of the principles of integration and the connection of all the mediums (Bayer, 1959; Whitford, 1984; Bergdoll & Dickerman, 2009; and Siebenbrodt, 2009).

In relation to the principles of mosaic art, it is important to bear in mind how they differ from simple notions of additive methods. For example, while the use of divisible units of construction, such as clay or wax, to build up a sculpture is an additive strategy, the chunks of clay or wax used at the start of the process are not easily noticeable and visible serially as in mosaic works. In contrast, in mosaic, the unit itself is indivisible or individual and lends itself to an atomistic or a constructivist view of the world. With

mosaic the eye easily perceives repetition of similar, regular units, the separations between them and discontinuous compositional lines, and there is a perceptual threshold that relates directly to scale and size of units. This threshold is not fixed and varies from work to work, depending on the distance between the work and the viewer, and what is described as the observer's *viewing horizon*. In other words, as mentioned earlier, it is the serialisation and interchangeability of units, the repetition of particular shapes, or even a colour element, that distinguishes mosaic from additive work in a more generic sense.

Through the method of working with repeated, serialised and interchangeable units, mosaic has unfolded in sculptures and installation art within the oeuvre of several contemporary artists who employ an additive method of working. In a sense, the advent of the ready-made and the influx of mass-produced objects, as well as their availability and seriality, highlights the return of methodological and formal concerns related to mosaic making. These concerns also connect mosaic principles with the recycling mode of production favoured by a number of artists. Examples of this are abundant, with Tony Cragg's floor and wall assemblages of the 1980s[70] (figs. 2.26 & 7.14 to 7.17) and El Anatsui's bottle cap sculptures of the 2010s[71] (fig. 2.27) providing useful points of reference.

Original in Colour

Fig. 2.26. Cragg. *Britain Seen from the North* (1981), courtesy of DACS

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[70] Cragg's work is examined in chapter seven.
[71] See my published text 'Nomadic Aesthetic: El Anatsui in Amsterdam' (2017), in the appendix.

Fig. 2.27. El Anatsui. *Man's Cloth* (2001), Collection of the British Museum

The books *Making Contemporary Sculpture* (2012) by Ian Dawson, *The Art of Not Making* (2012) by Michael Petry, *Raw + Material = Art* (2012) by Tristan Manco, *Sculpture Now* (2013) by Anna Moszynska and *Contemporary Installation Art* (2015) by Li Aihong, among others, contain a wide range of examples of sculptures and installations created in a way that can be understood as mosaical. Consequently, these texts can be seen to support the claim that there is a need to reconceptualise mosaic; to develop an expanded concept of mosaic and assert its categorical value alongside those of painting and sculpture.

In summary, this chapter has presented a definition of mosaic in a more conventional sense by discussing the additive method of making, on which mosaic is based, proposed a new understanding of scale through the notion of point-horizon and considered mosaic's influence on contemporary sculptural analysis. This chapter has also explored the issue of hierarchical positioning in relation to how mosaic is studied and understood, suggesting that a reconceptualization based on a mosaic-centred approach is much needed. This chapter has clarified that a mosaic method is more than

simply an additive method of composition and construction; it requires repetition, serialisation and interchangeability of units or compositional elements. This chapter has presented material that supports the claim that, as a structuring mode, mosaic is extremely prevalent, despite the apparent absence of more traditional mosaic works in art collections around the world. This fact reinforces the need for a reconceptualization of mosaic, one that evidences it as a form of practice much broader than hitherto understood, a matter explored in chapter three.

Chapter Three: Reconceptualising Mosaic

So far, this thesis has introduced the main methodological framework for the study. Previous chapters have provided a contextual overview of aspects of the processes and methods of mosaic making, as traditionally understood, which has roots across centuries of art history and art practice and relates to my approach to making in general terms. Chapter two raised issues concerning the way in which mosaic is traditionally studied, and proposed a re-evaluation of scale in line with current debates in sculpture. Chapter two also showed that the mosaic method is more than simply an additive method of composition and construction as it engages with a specific set of formal concerns which are relevant to a broader art practice context, highlighting the need for a reconceptualization of mosaic. Chapter three further develops historical and methodological issues through a synthesis of various concepts, and in doing so enables this thesis to propose a new notion that operates beyond conventional limits and asserts the categorical value of mosaic in contemporary fine art practice and criticism.

Fundamentally, the additive method that this thesis is concerned with is simply a means of ordering surfaces spatially with serialised, separate elemental units. It is a way of structuring the visual that has been used for millennia, manifested most clearly through mosaic works. However, this method has also been within the realm of textiles, painting, sculpture, installation art, and most recently, in the visualisation of digitised data, from digital photography to display monitors and 3D printing. Furthermore, this additive method is at the core of my artistic practice and enables that practice to function as a research mechanism within an experimental system, experientially testing strategies pertinent to mosaic making, such as fragmentation, inclination, modulation and repetition.

To reiterate what was said at the beginning of chapter one; this research brings together a historical overview, which incorporates an exploration of the broader cultural significance of mosaic principles, and an experiential engagement, provided by my practice. Thus, the thesis provides a historical mapping of mosaic practices and an account of a conceptual and experiential exploration of this particular method, which, in general terms, belongs to a sub-set of a technological relationship to making. This comprehensive study of mosaic art, its history and its principles, has led to a substantial understanding of the scope of mosaic and its philosophical ramifications.

In essence, this study holds that the departure point for a new understanding of mosaic principles within contemporary fine art practice can be located within the act of making. This approach recognises that mosaic draws on a set of principles that have existed and been studied since antiquity, and that it is contained within the idea of the ancient Greek word *techne*.[72] This ancient word is usually translated as art or craft, and understood to offer a counter to the word *episteme* (knowledge).[73] Therefore, *techne* can be understood as 'making' or 'creating' through physical endeavour. According to Shiner (2001:19),

> [...] the ancient Greeks, who had precise distinctions for so many things, had no words for what we call fine art. The word we often translate as "art" was *techne* which, like the Roman *ars*, included many things we would call "craft" [...] *techne* and *ars* referred less to a class of objects than to the human ability to make and perform.

The term *techne* became more closely associated with technique than with art, and was combined with the word *logos*[74] (reasoning) to form the word *technology*. Following this linguistic thread, the research presented here extends its methodological scope to encompass technology, in the sense that technology can be understood as being manifested *in* or *through* art, not necessarily maintaining its locus in isolation, and *vice versa*. This allows the research to engage with more fluid notions of art and technology despite deep-rooted disciplinary divisions and philosophical conundrums, in which the concept of *homology* employed by Barilli (2012), introduced in chapter one, is helpful.

Throughout the centuries, the production and dissemination of knowledge in the West became compartmentalised, giving rise to a diverse number of competing disciplines (Obrist, 2014:39-40). According to McLuhan, this compartmentalisation of knowledge is a direct consequence of the intrinsic fragmentary method deployed in the printing press introduced by Gutenberg circa 1439. From this angle, the fragmentary nature of alphabetic technology combined with the mechanical process of printing gave rise to modern Western thought.

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[72] Τέχνη: art, skill, cunning of hand [http://www.perseus.tufts.edu/hopper/morph (accessed 09.11.2015).

[73] *Epistêmê* is the Greek word most often translated as knowledge, while *technê* is translated as either craft or art. These translations, however, may inappropriately harbour some of our contemporary assumptions about the relation between theory (the domain of 'knowledge') and practice (the concern of 'craft' or 'art'). Stanford Encyclopaedia of Philosophy (2003) Episteme and Techne. http://plato.stanford.edu/entries/episteme-techne/ (accessed 22.08.2016).

[74] Λόγος: computation, reckoning [http://www.perseus.tufts.edu/hopper/morph (accessed 09.11.2015).

> It was the Gutenberg method of homogeneous segmentation, for which centuries of phonetic literacy had prepared the psychological ground, that evoked the traits of the modern world (McLuhan, 2011:312).

Consequently, a rift arose gradually between art and science that led to a compartmentalisation in the way knowledge is produced and transmitted in the West, which is felt to this day. McLuhan explains that this separation between art and science is the outcome of visual quantification and homogenisation caused by the printing press, which 'penetrated to every domain' (McLuhan, 2011:292). As a result, science was subdivided in several disciplines and art was split into fine and applied (Sennett, 2008:65-67; Shiner, 2001:3-10), categories that are undoubtedly historical constructions and, according to Shiner, could eventually disappear:

> Art as we have generally understood it is a European invention barely two hundred years old. It was preceded by a broader, more utilitarian system of art that lasted over two thousand years, and it is likely to be followed by a third system of the arts (Shiner, 2001:3).

However, this compartmentalisation, and the consequent debates about the relationship, or contention, between art and craft, does not take priority within this thesis in this broad sense.[75] What is important here is how recent practices both within art and science have tried to bridge the gap between disciplines, thus returning to a state within which the word *techne* can once again be pertinent across the divide. For McLuhan, our *Electronic era*[76] has provided a climate in which it has been possible for a reversal of the modern compartmentalisation tendency to be initiated. This era is characterised by simultaneity and organicity, it is rhizomatic in Deleuzian terms, not mechanical, lineal or arborescent. Electronic culture is enabling humanity to restore a more audile-tactile, or experiential, [77] approach to the production and dissemination of knowledge, analogous to pre-modern means. Within this context, the original meaning of the ancient Greek word *techne* has regained a wider currency and is interpreted here as *creative making*.

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[75] McLuhan's *The Gutenberg Galaxy* (2011) [1962] offers a comprehensive overview of the fragmentation and compartmentalisation of knowledge in the West.

[76] Einstein's recognition of curved space in 1905 officially marks the end the mechanical 'Gutenbergian era' (McLuhan, 2011:287). The 'Electronic era' begins homologically with Maxwell's descriptions of the electromagnetic field, bringing about the crisis of analytical reason and the fluidification of the fundamental principles for a single methodology based on guiding principles such as wholeness, structure, and Gestalt (Barilli, 2012:34).

[77] For instance, Merleau-Ponty's philosophy of perception and the embodied experience of the world.

For the sake of study, mosaic principles can be viewed as running along *two separate lines*, art and technology, which are homologous. In other words, these aspects of mosaic communicate fluidly and influence each other, as suggested by Barilli's (2012) metaphor of the *communicating vessels* explained in chapter one. In essence, the mosaic has its roots in the making of artefacts, artworks and buildings throughout history, from antiquity to the present day, and essentially, belongs to art as well as technology, manifesting itself through art, construction, as well as technology. Thereby, this gives rise to a methodology that can be recognised as *techne* in its most encompassing sense. Taking construction as an example, or engineering and architecture, this can be observed in the making of brick walls, pavements, glass windows, among other occurrences that make use of partible, separate, units. In art, this *techne* can be readily seen in mosaic works, but also in stained glass, inlays and even painting,[78] finding itself within the making of images, patterns and objects through divisible structural or compositional elements: that is, partible units.

To establish a methodology based on mosaic principles, this research draws together three approaches. One aspect of this is a historical contextualisation of mosaic art, and another is the analysis of mosaic's methods of composition and construction, which involves extracting visual evidence from artworks and artefacts. The other aspect takes up the philosophical ramifications of mosaic practices, which takes place through a carefully articulated and considered approach to bypassing the kinds of art-historical hierarchies biases introduced in chapter two.

As mentioned in chapter two, the Bauhaus was the first art school to systematise the mosaical methodology as an overarching unifying principle for the arts[79] (Bayer, 1959; Whitford, 1984; Bergdoll & Dickerman, 2009; and, Siebenbrodt, 2009), although the experiments of *De Stijl* also deserve mention in this respect. In a sense, on the part of the Bauhaus, this was an attempt to bridge the fine-applied art dichotomy (Moszynska, 2013:8). The Founder of the school, Walter Gropius, worked towards 'destroying the snobbish hierarchy that divided artists from artisans' (Gabet et al 2018:38) by devising a curriculum based on multidisciplinary training, with creativity and experimentation at the core of its philosophy. In this way the Bauhaus expanded understandings of the systematisation of a constructive compositional methodology involving elemental units,

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[78] Due to the nature of this research, it is good to observe that this thesis does not engage with a clear disciplinary divide between fine art and applied art. According to Moszynska (2013:8) there has been a 'rapprochement' between them 'allowing a return to principles of integration found in *De Stijl*, the Bauhaus and Russian Constructivism'.

[79] The influence of mosaic principles in a system for art and education is expound in chapters four and five.

which was also pursued by Russian academies such as the VKhUTEMA,[80] INKhUK[81] and RAKhN.[82] This created a climate that was conducive to the establishment of an investigative field of enquiry for the arts, which can be seen as the basis for current approaches to practice-based research.

The presence of a constructive methodology in art, based on elemental units of composition, emerged, in both material and conceptual senses, from mosaic practice. This is examined closely in chapters four and five but for now it suffices to point out that, following the process of enfolding-unfolding aesthetics proposed by Laura Marks (2010), this methodology can be traced within a historical horizon and can be clearly observed at points where the pictorial and the constructive, or structural, converge. That is, what is referred to here as the *mosaical* is evident in the communication, and points of convergence, between the symbolic stratum (art and science) and the material stratum (technology).

The Mosaical

The concept of the *mosaical* is the main contribution to knowledge made by this research. It is a concept that encompasses a methodology that is ancient and constructive, as well as artistic and technological. In art, the *mosaical* has its strongest and longest manifestation in mosaic work. However, as this study argues, this is not the only manifestation of the *mosaical*. It can be found in other art idioms as well, such as painting and sculpture and more recently installation art. In digital technologies, its strongest manifestation currently seems to be in terms of 3D printing. While the overarching methodology of these practices can be described as additive, in the context of this research, in terms of identification and definition, the word *mosaical*[83] is preferred.[84] This term is derived from *mosaic* and, in the sense that it is used here, it is positioned as having an equivalence with the *sculptural* and the *pictorial*. In English, the word commonly used by scholars and mosaic makers is *musivum*. However, this

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[80] VKhUTEMA, Higher Art and Technical Studios.

[81] INKhUK, Institute of Artistic Culture.

[82] RAKhN, Russian Academy of Artistic Science.

[83] Mosaical, adjective. Mosaic (in either sense): (1) 'A mosaical floor', Sir P. Sidney. In: Webster, P. & Webster, N. (1913) [1895] Webster's International Dictionary of the English Language. Springfield, Mass.: G. & G. Merriam Co. p.946. (2) Mosaical referencing 'the laws of Moses in the Bible'.

[84] The reason that *mosaical* is used and not *additive* is because the mosaic method is one of the first manifestations of the additive method that is most evident in art, the key argument of this research.

term is most strongly connected with the past of mosaic practices, and nowadays, it is barely recognisable as relating to mosaic. The *mosaical*[85] offers a formal set of parameters to analyse the constructive methodology within art history. It also makes it possible to present an alternative position for mosaic principles in relation to the development of 20th century art practices, one that bypasses art-historical hierarchies. Consequently, it becomes possible to distinguish a sculpture by saying 'it is a mosaical sculpture' (fig. 3.1) and a painting by 'this painting is mosaical' (fig. 3.2), and so on. At this point, it is important to note that the word mosaical is employed here in a sense of *mosaic qualities or principles* and not necessarily a mosaic work in a traditional sense.

Fig. 3.1. Cragg. *Secretions* (1998)   Fig. 3.2. Klee. *Athlete's Head* (1932)

The mosaical is actualised through an ordering of the surface in combination with the use of partible units. Ordering a surface has its most basic visual manifestation in the grid (Krauss, 1979a and Higgins, 2009). For Hoy (2017:114), 'the grid is an abstract measuring system that defines the relationships between objects in any image-construction, pictorial or notational.' The grid also manifests itself three-dimensionally as a matrix (ibid:119-120). The lattice is also a manifestation of the basic structure of the grid. Therefore, in modern technologies, it is correct to say that the mosaical

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[85] In current Italian art criticism, the Italian adjective *musivo* is usually employed to describe contemporary artworks that are based on mosaic principles (not mosaics in a traditional sense). However, there is no extensive research supporting a claim for a categorical value. This is provided by the present research.

manifests itself through the ordering of a surface coupled with the act of gridding which can be rendered visible, inferred or simply underpinning the visual.[86] For instance, the algorithmic organisational principles of sites such as Facebook and Twitter 'set up a basic multidimensional grid composed of repeatable units' (Marks, 2010:61).

It is important to recognise that the mosaical does not manifest itself only through the structure of the grid, and that the grid and the mosaical are not synonymous; as mentioned in chapter two, the placement of units in a mosaic can vary considerably and all *andamenti* cannot be constrained within the parameters of a grid structure. Nevertheless, this thesis gives special attention to the grid as a concept that is closely related to, but different from, the mosaical. Primarily, in this context, the grid is a conceptual structure for ordering space and, in the surface nature of a mosaic, it is manifested as *opus regulatum*. The grid as a conceptual strategy allows the mosaical to function as a mode of structuring the visual and serves as an important factor in the understanding of how mosaic principles contributed to the development of new technologies as a data visualisation method.

The Grid

The grid is deeply engrained in our culture[87] and has manifested itself since the dawn of civilization. In *The Grid Book* (2009) Hannah Higgins proposes that the grid, as a methodological tool for ordering surfaces, is around eleven thousand years old. It certainly predates modernity and has a long history. For instance, it can be found in Mesopotamia in the creation of mosaic works, in-lays and brick-works, as well as city planning.

> Bricks with one ornamental face have been arranged to create both abstract patterns and representational images that obscure the staggered grid of the simple brick wall. Such variations notwithstanding, the standard brick and the wall it forms when stacked have remained largely unchanged since the birth of the grid some 11,000 years ago (ibid:5).

The brick is an elemental unit of the 'grid wall' and, within the context of this research, it can be considered the first structural tessera. For Higgins, the grid manifests itself in several domains such as architecture and urbanism, language, art, among others. For

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[86] According to Rainey (1973:179), a grid pattern differs from simply a grid of squares.

[87] The *Plane of Consistency* in Deleuzian philosophy is described as a grid, 'the outside of all multiplicities' or rhizomes (Deleuze & Guattari, 1988:9).

instance, written language started as a pictogram system, representational and pictoric. In around 3000 BC, the first tablets were organised as grid systems through a repetitive sequence of images (pictograms) producing a visual as well as a conceptual (literary) narrative. 'The early cuneiform pictograph, while conventional, suggests that the origin of written language is fundamentally representational' (ibid:36). In this way, tablets were necessarily mosaical and relate to McLuhan's discussions in the *Gutenberg Galaxy* (1962), in which he suggests that the movable type is analogous to a mosaic tessera and created a perceptual revolution in the West that isolated the visual sense.

For Higgins, there are fundamentally two types of grid: the line-based grid, named *gridiron*, which relates to city planning and the lattice; and, the module-based grid, such as brick walls, which, in its reliance on *modularity*, is an important feature of the mosaical. Together line and module make up a 'grid field' (ibid:50). In city planning, the grid first appeared fully formed in around 2154 BC in the city of Mohenjo-Daro, in the Indus Valley, and it was subsequently imported to Greece (ibid:55).

> Whatever the source, the grid plan came into widespread use in the West following the rebuilding of the Greek city of Miletus [...] Alexander the Great would apply the gridiron to Alexandria as well as to the military outposts and cities [...] (ibid:57-68).

The application of the grid to city planning continued 'into the Roman era, when the gridiron would dominate military encampments' (ibid:60). According to Susan Tebby in the article 'Geometric Mosaics of Roman Britain' (1994), the principle of gridding is first a process of surveying and, in its largest scale, as a Roman technique or system known as *centuriation*, it was used as early as the 4th century. This system of ordering the surface becomes a principle of design instrumental in generating various patterns, and finds its way into mosaic making in all parts of the Roman Empire (Tebby, 1994:273).

According to Gombrich in *The Sense of Order* (1979), the grid structure, or *opus regulatum,* offers an 'ease of perception' that can be processed cognitively more efficiently than, for instance, the seeming chaos of crazy paving or *opus paladianum* (see figs. 3.3 & 3.4). For Gombrich (1979:75), a grid is a 'composition of a simple repeat pattern' that can become monotonous in perceptual terms, but when it incorporates a break in continuity, such as colour or a visual accent, the grid captures our interest. In this way, the regularity, simplicity and order of the grid begets encoding[88] through our

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[88] Mosaic as precursor to modern digital codes is discussed by Gombrich in *Art and Illusion* (2000) [1960]*,* and is further explored in chapter seven of this thesis.

perception of irregularities along the lines of the structures. Therefore, it builds on the structure to generate meaning, because 'our whole sensory apparatus is basically tuned to the monitoring of unexpected change' (ibid:108). In turn, when the cognitive processing ability provided by gridding is combined with partible, discrete, repeatable and interchangeable units of composition to create a consistent whole, which could be an object or image, it enables the production of a series of artefacts, artworks and architectural structures, actual or virtual. This same methodological development is evident today, applied to the visualisation of data in digital technologies across the board, constituting the bases for HD monitors, smartphone screens and 3D printers.
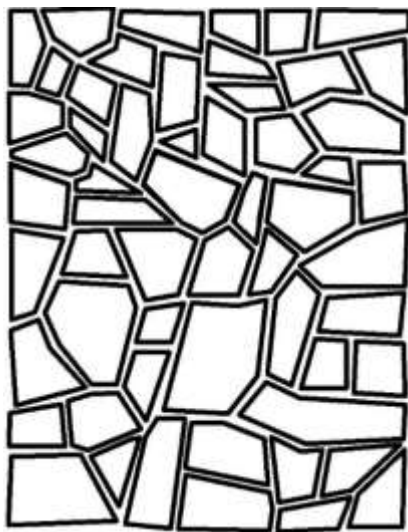
Fig. 3.3. *Opus Paladianum*
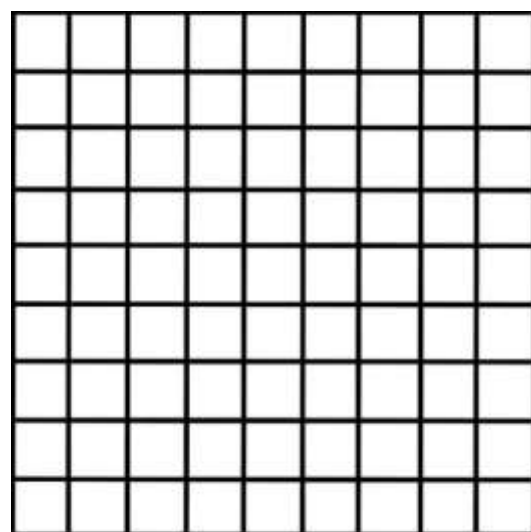
Fig. 3.4. *Opus Regulatum*

In 'Grids' (1979), Krauss analyses the grid with reference to Modernist painting, primarily through the works of Piet Mondrian and Josef Albers. She recognises that this structural element goes much further back in the history of art (Krauss, 1979a:50). For Gage (1993:258), explaining that the grid in Modernist painting was

> [...] borrowed from experimental psychology [and] became widely interesting to non-representational artists around 1920, and Vilmos Huszárs's *Composition*, 1918, is one of the earliest to be based on it.

For Krauss (1993:11), the appearance of this *emblematic structure* in modern art in the 20th century is due to two occurrences in the 19th century: the scientific experiments with light and colour (physiological optics) and the symbolist window, which is also a

consequence of the drive towards abstraction after Neo-Impressionism.[89] According to Krauss, painting was rationalised 'around the laws of color[sic] theory and physiological optics,' underpinned by the basic grid arrangement. For Krauss, the grid unfolds in two different ways in painting, the centrifugal grid that expands outwards from the frame *ad infinitum*, reminiscent of tessellated works, and the centripetal grid that focuses inwards, reinforcing the 'autonomous and autotelic' nature of art (Krauss 1979a:60-63). These two separate occurrences of the grid or *opus regulatum* identified by Krauss offer a link between modern painting and the ancient past of mosaic.

As a conceptual organisational tool, the full potential of the grid is realised through the invention of the printing press by Gutenberg (c. 1439). In *The Gutenberg Galaxy*, McLuhan explains that the movable type is an adaptation or utilisation of mosaic principles applied to language in combination with the principles of gridding of the opus regulatum kind. According to McLuhan, every movable type is a tessera, and the combination of these limited letter forms creates words that are fragmented, lineal and arranged spatially on the page. McLuhan argues that this innovation caused a revolution in cognition that split the senses by accentuating and isolating the visual: 'printing moved the word away from its original association with sound and treated it more and more as a "thing" in space' (McLuhan, 2011 [1962]:199-200). McLuhan goes as far as to suggest that this process induced individuality and ultimately caused nationalism, which 'derives from the "fixed point of view" that arrived with print, perspective, and visual quantification' (ibid:250).

According to McLuhan, printing with movable type operated within a different cultural horizon than manuscript. Cognitively, manuscripts preserved the connection between all senses, thereby maintaining the orality of language. The printed book then introduced a new way of perceiving the world, in essence it was a vehicle of change that drove mechanisation and created the industrial revolution. 'The assembly line of movable types made possible a product that was uniform and as repeatable as a scientific experiment' (ibid:143). In this way, the printed book made possible the maturing of the compartmentalising, mechanised mindset and caused the separation between art, religion and science, bringing Euclidean geometry to fruition. It is within this context that the grid itself as an abstract and conceptual organisational structure gained strength and realised its full potential. The repeatability of scientific experiments, the flourishing of Euclidean geometry, Cartesian space and the drive

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[89] These topics are further developed in chapter four.

towards objectivity lend support to the grid becoming the optimal organisational structure in a culture heavily reliant on visuality. Homologous with the printed book, there is easel-painting with its organisational grid of the single-point perspective. Both the printed book and the easel painting created a shift in cognition that drove the idea of privacy forward and moved the power away from the library and the church. Hence, communal spaces of sociability and knowledge acquisition were relinquished for the privacy of the household. In other words, the Gutenbergian era drove scientific knowledge forward, alongside Cartesian space, individuality, repeatability and fragmentation.

Revealing the Mosaical

In contemporary fine art, mosaic art is commonly hidden within the interstices of normative art-historical discourse, which means that revealing the mosaical within a historical horizon and exposing a narrative for mosaic art requires the articulation of several methodological concepts and connecting threads. The concept of *Kunstwollen*, developed by Aloïs Riegl (1893)[90] and adopted by Paul Crowther (2002) as *art-drive* to support the normative state of art or picturing, is relevant to this articulation alongside notions of the *rhizome* and *enfolding-unfolding aesthetics*.

In his book *The Transhistorical Image* (2002) Crowther maps out the importance and significance of art and its intrinsic aesthetic value. His approach seems to mark a turning point in recent art criticism as, using the concept of *kunstwollen*, he places Kantian thought back on the agenda. This approach moves away from a tradition of art criticism that considers the artwork as a reflection of society: artworks simply as documentation of a period, disregarding the specificity of mediums. For Crowther, art has an intrinsic value over and above its mere documentary function, an idea that resonates with other thinkers whose work similarly restores this aesthetic value in contemporary art criticism, such as Barilli (1984, 1993 & 2012), Hoy (2017), Marks (2010) and Schwab et al (2013).

As introduced in chapter one, Marks' concept of *enfolding-unfolding aesthetics*, developed through Deleuze's concept of the *fold* and Foucault's *archaeology of knowledge* in combination with Islamic philosophy, takes *kunstwollen* into account,

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[90] Concept developed in Riegl's second book *Stilfragen: Grundlegungen zu einer Geschichte der Ornamentik*.

which enables connections to be made between ideas, visual structures, materials and objects that might seem disparate at first glance, but in fact are manifestations that enfold and unfold at different points in time. For Marks (2010:108),

> Kunstwollen works in the transmission of ideas through forms themselves. Form travels, from the complex designs [...] to our twenty-first-century eyes, gathering and changing meanings along the way.

Consequently, this renewed interest in the study of formal compositional elements as they travel and transform through time and across cultures, is relevant in positioning the mosaical as a valid fluid category across mediums within a general concept of art, and in its extension to digital technologies. For Marks,

> The new electronic and digital media inherit the ornamental mode, in that they oscillate between figurative and nonfigurative, between the image and the code that produces the image. Electronic and digital media are the profoundly disguised ornamental art forms of our time (ibid:116).

Through *kunstwollen*,[91] 'the ornate has recorded a consistent victory over the plain' (Barilli, 1993:103) and mosaic principles have moved from a very tangible material practice or manifestation into a *virtual*, intangible one, a new materiality: the electronic mosaic (ibid:92).[92]

The electronic mosaic of current digital technologies is not easily perceived by the viewer as its infrastructure is no longer visibly evidenced in the way that it was in early computer graphics. In other words, the way the image is constructed, and patterns created, is no longer obvious and visually noticeable, an issue that Hoy (2017) explores through the development of her concept of *digitality*. Hoy recovers a notion of digitality or digital method that predates the invention of contemporary computer devices and is directly linked to mosaic principles. In this context, her notion of a mosaic relates directly to image structuring factors (material stratum) according to which the units of composition are no longer perceived individually. In the case of digital technologies, mosaic passes from a perceivable visual layer to an invisible layer below human perceptual level, surpassing the achievements of micromosaics from the 19th century,

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[91] Barilli adopts *Kunstwollen* through Focillon's *Vie des Formes* [Life of Forms]. According to Carboni (2000), Riegl's concept is influential and can be linked to a school of thought that includes Bergson, Deleuze and Focillon. George Kubler's concept of *Sequence* developed in *The Shape of Time* (1962) is also derived from this line of thought.

[92] The electronic mosaic is further discussed at the end of this chapter as well as chapter seven.

where individual units of composition were barely noticeable at a very close distance.[93] However, this invisibility is not always maintained; on occasion a failure, or *glitch*, in digital technologies reveals the mosaical image below the surface. For Hoy (2017:3), glitches are evidence of 'digital processing embedded in the picture's formal configuration.' In this way, the manifestation of glitches in digital technologies is used in my research as an analytical tool, one that informs and makes visible the processes of image construction otherwise hidden from perception, as explored in my series *Interference* (2016) (fig. 3.5). Furthermore, the technology underpinning 3D printing provides another instance of mosaic principles contributing to a new materiality: in this instance, objects are created digitally, rendered through a build-up of volumetric units that are stuck to each other to produce the printed object. The volumetric unit or voxel is not perceived by the eye individually. However, mosaic principles are present in structuring its processing.

Original in Colour

Fig. 3.5. de Melo. *Interference Series* (2016)

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[93] The Gilbert Collection at the Victoria and Albert Museum in London has several examples of micromosaics. https://www.vam.ac.uk/collections/gilbert-collection (accessed 25.07.2018).

In sum, the concepts of the grid and *kunstwollen* explored above enable this research to show how mosaic principles have enfolded and unfolded across millennia. Mosaic has not simply vanished from sight, rather, coupled with the *grid* through *kunstwollen*, it has transformed and evolved, becoming submerged beneath the interstitial perceptual threshold[94] as a way of structuring the visible. It has also unfolded within contemporary art as assemblages, installations and, most obviously through the current trend of rematerialisation of the digital image, a topic further explored in chapter seven. Another concept involved in a broader notion of mosaic worth exploring is *modulation* and its relational equivalent *additive synthesis*.

Modulation

In art, the idea of modulation as a method applied to the making of artworks and artefacts has its origins in mosaic work. For example, in *Art and Illusion* (2000) [1960] Gombrich explains how mosaicists of classical antiquity succeeded in creating the basic relationships of form in space by placing tesserae of only four graded tones side by side. He compares classical mosaic works to the telegraphic technology of image transmission through the modulation method still in use in Western art (Gombrich, 2000:39-41).

For Bandini (2012), modulation is opposed to the physical mixing of paint, the act of smearing blotches of colour with each other. In this sense, modulation is the manner of composing a work by means of solid independent, discrete, geometric units placed side by side, with each unit maintaining its independence. While these units remain separate, there is also an important relation established between them creating an overall effect or image, a manifestation of the basic relationships of form in space describe by Gombrich. Colour mixture through additive synthesis of independent units is a good example of this.[95]

> [W]hen differently sized blocks of colour are placed side by side, and viewed from a distance, smaller or thinner areas tend to change in appearance more than larger ones. Alternatively, where two or more colors[sic] are mingled as a mosaic of brushstrokes all roughly equal in size, they can fuse together so well that their individual identities are lost (Osborne, 2004:27).

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[94] When the individual units of composition are noticed by the viewer, highlighted by a clear observation of interstices.

[95] Additive synthesis is further developed below.

Modulation as an additive method of construction and composition is intrinsic to mosaic due to its inherent material constraints: units of glass, stone or ceramic cannot be physically mixed. These units of colour can only mix in the retina of the viewer when the work is observed at a certain distance. The illusionistic style and modulation in the 2nd century floor mosaic of Antioch is a great example of the expertise of classical mosaic makers in using these intrinsic constraints in the construction of magnificent floor pieces (fig. 3.6). Modulation in art exemplifies how the technical material stratum of mosaic influences the ideal stratum of symbolic forms, where structural constraints are the foundation of compositional elements.
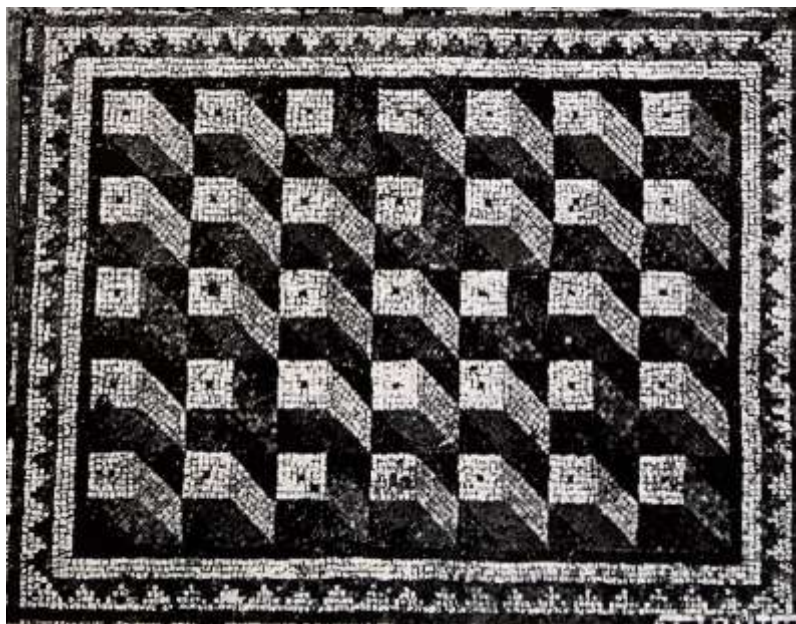
Fig. 3.6. *Floor Mosaic*, Antioch (2nd century)
As published in *Art and Illusion: A Study in the Psychology of Pictorial Representation* by E. H. Gombrich, Princeton University Press, 2000

Modulation is not restricted to mosaic work, it is also widely used in other mediums. Gombrich analyses it as a code that conveys illusion in the creation of images in Western art, from a simple binary positioning to more complex arrangements. He gives 16th century Venetian lace as an example, noting that 'the netting is filled in or left empty of pattern' to create images from the relationship between both 'yes' and 'no' signals (Gombrich, 2000:39-40). The binary modulation present in textiles corresponds to classical black-and-white floor mosaics. For Barilli (2012:98), Goya's tapestries are also products of modulation, images that are coarse-grained handicrafts 'born in the workshop [...] made of a limited number of discrete components arranged in a

calculated, rational fashion', undeniably related to mosaic, glazes and Gothic stained-glass.

In painting, modulation relates to a way of working that Gombrich describes as a *mosaic method*: breaking the composition down into geometric shapes. 'Cézanne's much quoted advice to Bernard to look at nature in terms of simple shapes [...], cylinders, cones, and spheres' (ibid:306), corresponds with the *opus sectile* technique in mosaic terms. Thus, modulation in painting is connected historically with mosaic making. According to Hills (1987:29), as mosaic practices 'lay-in colour by illumination,' they offer painting 'lessons as to how colour and composition affect values of illumination.' In this way, the notion of adopting the primacy of colour in painting fuelled the argument between the Venetian school and the Florentine (*colore* over *disegno*). Gombrich (1995:325), suggests that the Venetians' favouring of colour indicates a bias toward the Byzantine mosaic tradition and the craftsmen's modulation method. The *colour* over *line* debate was reignited in France in 1671 with the Rubenists favouring colour on one side and the Poussinists favouring line on the other. However, it is not until the works of the Post-Impressionists in the late 19th century, that a triumph of colour over line is established.

Modulation is usually defined in opposition to modelling or delineation. According to Sjåstad (2014:93), modulation is a way of working with colour contrasts and modelling is based on the traditional way of working with light and shade (*chiaroscuro*) or grey scale. This flags up a key difference, in that modulation is realised through discontinuity, while modelling and delineation depend on linear continuity. Even though it is possible to delineate with 'solid' units, as in an *opus vermiculatum,* the lines produced by such a strategy are always fragmented. Furthermore, for Hills (1987:31), compositional modulation in mosaic omits linear contours, and colour passing from foreground to background 'offers no contradiction to reality of surface as architectural vestment', no sense of pictorial illusion. Sjåstad (2014:93) points out that 'Cézanne called his own method modulation,' and that his approach to painting can be compared to a kind of *opus sectile* that fits together visual sensations (in the form of specific shapes such as cylinders, cones, and spheres), which, in essence, references the modulation methods used by Monet and Pissaro. According to Merleau-Ponty (1964:12), Cézanne wanted to represent objects by 'a modulation of colours which stays close to the object's form and to the light it receives.' In fact, Cézanne's use of dabs of colour directly from the tube is very much like a 'readymade' tesserae (Sjåstad, 2014:95); a point that Hoy (2017:83) takes up in discussing Cézanne's method of juxtaposing shards into modulated

compositions of 'atmospheric spatial fields' resembling tessellated mosaic surfaces as a precursor of Cubism (fig. 3.7). As tactile and visual as a tessera (a cube of colour), Cézanne's use of modulation is an attempt 'to splice vision and touch together [...] and invent a tactile vision' (Bois, 1998, cited in Sjåstad, 2014:89). This is clearly influenced by the widespread interest in colour theories in the late 19th century in intellectual circles in Paris and the approach to modulation Cézanne pioneered in France was continued by his fellow Post-Impressionists George Seurat and Paul Signac.[96]

> [...] the "two-dimensional" mosaic or painting is the mode in which there is muting of the visual as such, in order that there may be maximal interplay among all the senses. Such was the painterly strategy "since Cézanne", to paint as if you held, rather than as if you saw, objects (McLuhan, 2011:49).

According to McLuhan (2011:93-94), by 'giving tactile value to retinal impression' Cézanne's use of modulation led to 'the disintegration of the idea of the "imitation of nature" as a visual affair.' Furthermore, this attitude to painting breaks the paradigm of the single-point perspective born in the Renaissance, which, as McLuhan points out, is homologous with the invention of the printing press by Gutenberg. Tactility being restored by Post-Impressionist painting causes the stress on the visual sense to lessen and moves towards restoring the interplay of all the senses: this offers something of a return to a pre-modern, audile-tactile way of sensing, for 'tactility is the mode of interplay and of being rather than of separation [of senses] and of lineal sequence' (ibid:273).

Original in Colour

Fig. 3.7. Cézanne. *Mont Sainte-Victoire* (1904)

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[96] This topic is further developed in chapter four.

In Russia, contemporaneous to Cézanne in France, Vrubel deliberately reproduced mosaic tesserae in his paintings. According to Taroutina (2013:10), Vrubel developed a Modernist pictorial structure that can be compared to Cézanne's, but in Vrubel's case this was derived explicitly from a knowledge of mosaic making and restoration. Vrubel's approach acknowledged the materiality of paint and the flatness of canvas. In essence this returned a pre-modern tactility to the pictorial surface. Historically, Vrubel's work belongs to the Russo-Byzantine revivalism of the 19th century. He was a major influence on the Russian avant-garde, including Tatlin and Rodchenko, whose works address tactility both in painting and sculptural works.

In sculpture, modulation comes to the fore in the experiments with *faktura* of the Russian avant-garde, a topic further developed in chapter five. For Taroutina (2013), Tatlin's adventure into three-dimensions was influenced by the spatial logic of the mosaic icon and the materiality of religious icons with their encrusted surfaces. Furthermore, Tatlin studied mosaic with Aleksei Afanasiev, whose influence informed his entire career. Tatlin developed faktura sculpturally through his 'materiological determination' and addressed material heterogeneity, which included space itself, as evidenced by his *Corner Counter-Reliefs* (1914-1915). However, modular structures are implicit in Tatlin's sculptural works and the heterogeneity of his 'units' do not necessarily recall tessellated surfaces. Nonetheless, he clearly inaugurates a kind of material modulation that becomes influential in later 20th century sculptural practice.

Material modulation and unit homogeneity is perhaps more evident in Rodchenko's work than Tatlin's. Rodchenko's experiments with faktura led him to develop a sculptural practice that focussed on the regularity of repeated forms. According to Gough (1999:53), Rodchenko developed an indexical principle, a form of modularity, in response to Tatlin's subjective approach and material heterogeneity. Rodchenko's modularity was explored in a series of experimentations with mechanical processes moving 'faktura off the surface and into space' (ibid:55). Alongside Rodchenko, Karl Ioganson was also involved in developing sculptural modularity, producing a series of experimental sculptures 'through either deductive or nonrelational progression of modular units' (Gough, 2005:12). Material modulation became the favoured sculptural method of construction and the pillar of Constructivism. For May (2001:5), 'construction as a fundamental formal principle has come into being as a definition of a new generic practice only since the early twentieth century.' With modulation as a method applied to the construction of sculptures, and a concept used in the emergent practice of

design, once again the "low" material stratum converges with the "high" stratum of symbolic forms.

The tactility explored by Constructivism through material and spatial modulation became influential and still resonates with artists to this day. In Minimalism, modulation of homogeneous repeated units gained autonomy, becoming a concern in its own right. For instance, Judd's colourful late pieces deployed colour through sculptural spatial modulation, making an obvious reference to Cézanne's tactile paintings (Shiff, 2014:123). For McLuhan (2011:75), writing in the 1960s, the sculptor is seen as a *modulator*, as 'sculpture, now as ever, is the frontier between the spaces of sight and sound. For sculpture is not enclosed space. It modulates space, as does sound'.

In sum, modulation is a method of composition with separate independent units inaugurated by mosaic making due to material constraints. This involves an interplay between the elements which act on one another creating an overall pattern, an image or even a conceptual narrative. The constructive and compositional units or tesserae address image making at both structural and pictorial levels, initiating an interplay of senses. That is why McLuhan opposes mosaic to the 'single-point' perspectival paradigm of the Renaissance. Modulation finds its resonance in the new electronic age and the restoration of a collective, 'tribal' and pre-modern way of interacting with the world. Modulation as a method in painting restores tactility and ends the mimetic-conceptual framework of art, enabling artists to create new work from the bottom up. Freeing modulation from the constraints of the canvas, sculptors were able to develop a spatial practice that restored a collective and phenomenological experience of art. For Bandini (2012:85), the modulation encouraged by mosaic 'is present at the very heart of contemporary culture'.

As mentioned previously, a hierarchical approach to analysing mosaic works prevails. In other words, most critical approaches tend to look at mosaic through the lens of the fully-fledged single-point perspective of painting. For McLuhan (2011:19),

> [t]he illusion of the third-dimension is [...] far from being a normal mode of human vision, three-dimensional perspective is a conventionally acquired mode of seeing, as much acquired as is the means of recognizing the letters of the alphabet, or of following a chronological narrative.

In this way, the account provided by Crowther (2002:47-49) regarding Panofsky's historical speculation on the notion of symbolic forms serves as an example of how mosaic work is misinterpreted. Crowther uses the mosaics of the basilica of San Vitale

in Ravenna to explain Panofsky's elaborations on the perspectival image. The mosaic is simply presented as an *in-between state* of 'cluster perspective' of classical antiquity and a planar conception of pictorial unity, thus, not carrying a fully-fledged mathematical perspective. It is an interesting analysis; however, it perpetuates a hierarchical and linear positioning that subordinates mosaic to painting. In this way, image modulation and the materiality of mosaic, its qualities and constraints, are not addressed.

In conclusion, according to McLuhan (2011:49) based on Professor von Bekesy's analysis, the hierarchical approach that favours painting creates a paradox, for the supposedly

> [...] two-dimensional mosaic is, in fact, a multidimensional world of interstructural resonance. It is the three-dimensional world of pictorial space that is, indeed, an abstract illusion built on the intense separation of the visual from the other senses.

Additive Synthesis

Additive synthesis is relational to modulation, it is the result of independent units of colour placed side by side interacting and influencing one another. According to Aumont (1997:11-12), in Newtonian colour theory, colours are combined in two ways: 1) additive mixture or retinal mixture, producing a lighter hue, specific to mosaic, television, monitor screens and video; and 2) subtractive mixture or mixture of pigments, producing a darker hue, such as in painting, modern form of photography and colour cinema.

In mosaic, additive mixture is bound by material constraints; as tesserae do not mix with one another (fig. 3.8) they must be juxtaposed, or modulated, which uses a method intrinsic to mosaic, as explained above. For Gage (1993:42), it is 'one aspect of mosaic technique that can be closely related to contemporary theory of colour, namely *optical mixture*.' In mosaical forms of painting, additive synthesis is a conscious choice based on the influences of the colour theorists of the 19th century such as Michel Eugène Chevreul and Ogden Nicholas Rood. In compositional terms, with pointillist and divisionist painting, there is a passage from the subtractive handling of paint by the artist to an additive approach.[97] According to Ratliff (1992:141), painting pigments

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[97] Additive synthesis related to painting is discussed at length in chapter four.

applied additively can create 'optical mixtures,' like projected beams of light. In this way, the essence of colour manifests as separation on the surface of the canvas and as purity of mixture in the retina producing lighter hues and a more luminous effect.

Original in Colour

Fig. 3.8. de Melo, *Luminous Impulses* (2015)[98]

Ratliff (ibid) gives a straightforward account of the ways in which additive and subtractive mixtures work (fig. 3.9):

> In additive mixture by fusion the two pigments act separately and independently of one another. The absorption of light by one pigment has no effect whatsoever on the light absorbed by the other. Thus, the light reaching the eye from one pigment is not diminished in any way by the other pigment. In a physical mixture of two pigments, however, all of the light ultimately reaching the eye is subjected to two successive processes of absorption – one by each pigment in the mixture. Thus, the light that passes through and is partially absorbed by one pigment is further diminished as it passes through and is partially absorbed by the second pigment on its way to the eye. That is why such a mixture is called subtractive.

[98] Note that *Luminous Impulses* is used here simply as an illustration of additive synthesis. However, it is a work that fits within the discussions in chapter seven regarding mosaic and the rematerialisation of the digital. This work is an interpretation in mosaic of a sector of the cosmic microwave background map of the early universe. It is a look back in time to the earliest light ever emitted. This work was composed based on the opus regulatum (grid) and it was only possible due to new technologies of space exploration and the availability of images online. The title makes reference to Pointillism and John Ruskin's theory as expressed in *The Elements of Drawing* (1857). Ruskin became an important mentor for Paul Signac who almost literally employed his ideas in painting, developed in chapter four.
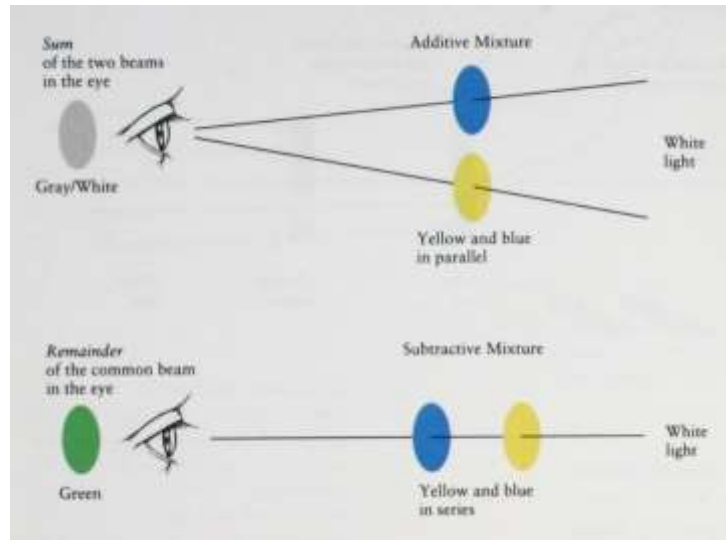
Fig. 3.9. Ratliff. *Schemas of Additive and Subtractive Mixtures* (1992),
Courtesy of Rockefeller University Press
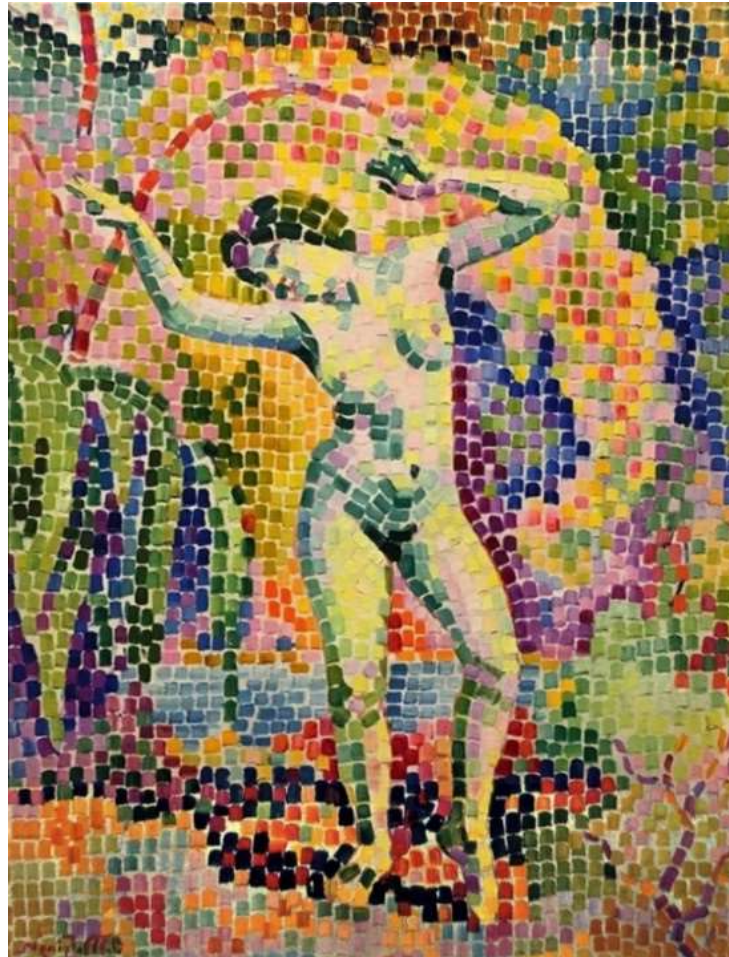
Fig. 3.10. Metzinger. *Dance (Bacchante) (1906)*

By observing the schemas above, we understand how Seurat used the 'subtractive'
mixture intrinsic to materiality of paint in his compositions but also applied paint

additively in a dotted fashion, thereby not quite creating a proper mosaic style (figs 4.1 & 4.3). This also explains the greying effect[99] that happens in his paintings. This triggered the adoption of a larger tache by Divisionist painters such as Signac, Delaunay and Metzinger (fig. 3.10), a style closer related to mosaic tesserae.[100] Gage (1993:224) suggests that the greying effect is the result of 'an imperfectly digested theory.'

In respect to optical theories, the connection between mosaic and Neo-Impressionist additive application of paint seen in works such as Metzinger's can be traced back to Antiquity. For example, Aristotle spoke of such connections in relation to the foundation of optics.

> Aristotle distinguished two types of mixtures as homogeneous physical mixtures and purely perceptual 'optical' mixtures [the latter attributed to Democritus] (ibid:31).

According to Gage (ibid:42), mosaic works, as well as textiles, have aided the study of optics in antiquity. 'Tapestry and mosaic commonly work with equal-sized, regularly spaced units of colour, to create a homogeneous visual effect.' In relation to this, Gage cites examples of loop-tapestry from Akhmin (4th century) and a mosaic pavement from Antioch that used 'optical mixing techniques;' the specific circular patterns in these examples 'recalls the bands of colour spun on a potter's wheel in an experiment with mixtures described by Ptolemy.' For Gage (ibid:27), a much wider range of bright colours made entirely of glass cubes found in a mosaic pavement border in Corinth (1st century) is likely to have contributed to the development of technological tools that eventually allowed mosaic principles to influence the development of printing processes and, more recently, digital technologies. Professor Rolf Kuehni (2011:10686), offers a comprehensive passage on the subject.

> Mixture of stimuli by rapid succession in the field of view was first described ca. 170 CE in the Optics of Greek-Egyptian natural philosopher Claudius Ptolemaeus (ca. 100 CE – ca. 170 CE; known as Ptolemy) [...]. Mixture of spatially minute stimuli was probably known in antiquity from viewing mosaics or textile materials finely woven from differently colored[sic] yarn from a distance that did not allow the resolution of the colors[sic] of the individual tesserae or yarns. It became technologically important in the three-color image printing process by Jacob Christof Le Blon (ca. 1710) [...] progressing to half-tone printing and display monitors [see fig. 1.2].

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[99] Gage (1999:200) suggests that the greying effect in Seurat's paintings 'may well turn out to be the most sincere of the tributes paid by nineteenth-century painters to the work of Chevreul' and his casual establishment of a grey-scale.

[100] This is further explored in chapter four.

For Gage, the mosaic maker shares knowledge of additive synthesis with the scientist; the first through practical work that is likely to be based on a process of trial and error during the development of mosaic works, and the second through observation and theoretical work. Ptolemy's studies 'may well have been stimulated by the experience of mosaic decoration,' as implied by his most recent editor (Gage, 1999:79-82).
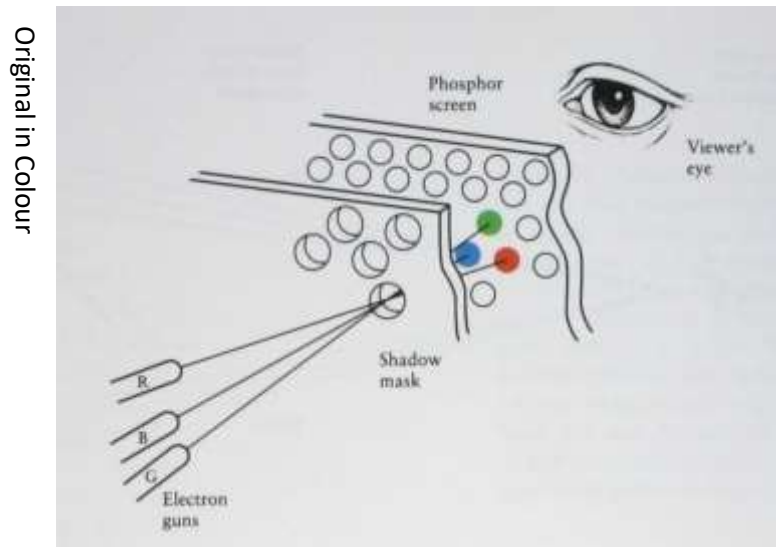
Fig. 3.11. Ratliff. *Additive Mixture of Colour in Television* (1992), Courtesy of Rockefeller University Press

The optical body of knowledge that underpins the influence of mosaic principles on small screen technology also incorporates the understanding of the physiology of the eye, as expressed by Thomas Young in his lecture 'On the Theory of Light and Colour' at the Royal Society of London, published in 1802. According to Torcellini (2017:39-41), Young was the first to propose that 'the retina was made up of a mosaic of tiny light-sensitive cells;' that is, it consists of three colour receptors tuned to different ranges of wavelength (red, green and blue-violet light). Ogden Rood disseminated Young's notion of the retina as a mosaic in his *Modern Chromatics*; 'retinal pictures are, as it were, mosaics, made up of an infinite number of points of light' (Rood, 1879:10). Young's hypothesis was developed by German physician Hermann von Helmholtz into a theory with far reaching consequences for the technologies of the emerging Electronic era such as television (fig. 3.11) and more recently computer monitors and smartphones.

> The interface between us and the pulsating heart of the machine is a mosaic of pixels coloured red, green and blue. The principle of operation is simple and involves creating images by combining reasonably uniform elements in a limited range of colours exploiting the limits of acuity of the human visual system (Torcellini, 2017:39).

In this way, the mosaical physiology of the eye further evidences how mosaic principles have manifested themselves in several moments throughout history both in art and science, enfolding and unfolding, not in isolation, bridging several fields of practice, forming rhizomes along the way, connecting the material with the symbolic strata.

> Science has always played an important role in art, and vice versa; thus, it often is difficult to differentiate between them historically. In modern times, the sciences and the arts have been divided into two very different intellectual fields [...] but in early Modernism, science was of great importance to many writers and painters (Sjåstad, 2014:102).

Recalling Barilli's suggestion that Seurat anticipated televisual technology, as proposed by McLuhan, it is interesting to note that for Hubert Damish (cited in Sjåstad, 2014:101), Seurat's technique is understood as an *epistemic break*. This quality of Seurat's work can be understood through Rheinberger's notions of *experimental systems* in art and science, introduced in chapter one. Within the context of technical and artistic experimentation at the end of the 19th century, Seurat provided science with a tool that was eventually developed in television technology and further into digital screens. It is possible to assert that Seurat's Pointillism falls within the graphematic space of television, through his engagement with colour theory, the repetition of material activity and his development of Pointillist paintings. For Ratliff (1992:141), by exploiting the limits of human visual acuity, the coloured phosphors of small screen technology do not differ significantly from a true pointillistic mixture of colour in the retina.

Through the notion of an experimental system that bridges art and science, it is easier to comprehend how Seurat's Pointillist brushwork anticipated television's method of image making. Hence, McLuhan's proposition is more than simply a hunch, it is based on careful observation and acute cultural analysis. For McLuhan (1964:249),

> [t]he stipple of points of Seurat is close to the present technique of sending pictures by telegraph, and close to the form of the TV image or mosaic made by the scanning finger. All of these anticipated later electric forms because, like the digital computer with its multiple yes-no dots and dashes, they caress the contours of every kind of being by the multiple touches of the points. Electricity offers a means of getting in touch with every facet of being at once like the brain itself. Electricity is only incidentally visual and auditory; it is primarily tactile.

If stretched further in time, through the notion of *kunstwollen* brought forward by Aloïs Riegl, explored earlier in this chapter, television with its 'mosaic mesh of dots'

(McLuhan, 1964:161) and pixelated digital screens are a consequence of the Byzantine mode of representation with luminosity at its centre.[101]

> The luminosity of ecclesiastical interior was an image of the heavenly light: it was not simply for aesthetic enjoyment or conspicuous display that mosaic was developed as the supremely luminous form of painting [...] (Gage, 1993:44).

The Electronic Mosaic

As discussed above, mosaic has contributed the methodology of additive synthesis through colour modulation to art and technology. In this sense, modulation originated in the material stratum and was explored symbolically. In addition, through its tessellated surfaces made of visual-tactile units that allow the interplay of senses, mosaic as medium carries an *in-between* condition. A mosaic can also create the illusion of flatness in a pictorial sense through its essentially three-dimensional nature. Mosaic relates to a structuring material state that becomes surface and image, which is based on the modulation of thousands of independent units that affect one another, a condition that warrants its strength, yet triggers its vulnerability. The materiality of mosaic hovers between the pictorial and the sculptural and is usually amalgamated with the architectural. Mosaic is a highly misunderstood medium and often analysed through a hierarchical perspective of history.

The in-betweenness of mosaic, triggered by its materiality, is also present in its latest material guise: the electronic mosaic. In other words, in the digital visualisation of data, mosaic hovers between code and image. Nowadays, the materiality of the electronic mosaic is only fully apprehended when the digital systems that generate the image from code stop working properly and the image collapses into glitch mode, revealing the grid arrangement and the fragmentation of its surface.

The *in-betweenness* of mosaic is crucial to developing an understanding of it both as art and as technological tool for the creation of images or immersed experiences. Mosaic offers a way of visualising code and its principles structure and organise the visible surface, holding the image together on a level beneath human perception. In other words, the electronic mosaic can be understood as a membrane to the visual, between image and code. Consequently, the understanding of the relation between

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[101] This is a discussion beyond the scope of this fine art thesis, but none-the-less serves as an informative background to the research.

mosaic principles and the modulation method strengthens the potential of mosaic art; its flattening abstract qualities when applied to painting and its structural three-dimensional potential when applied to sculpture.[102] It is this breadth of connection that makes mosaic an interesting and challenging subject of study and this is further strengthened by the way in which, as a mode of structuring the visual, mosaic principles provide a formal set of parameters that enhance significantly those offered by existing sculptural and purely pictorial frameworks. Mosaic, 'a multidimensional world of interstructural resonance' (McLuhan, 2011:49), creates rhizomes with many fields of practice and its *in-betweenness* is potentially a subversive force in contemporary art, as it undermines deep-rooted tendencies and debates centred on meaning and the documentary function of art.[103]

Additive synthesis through modulation can be seen as enabling the passage of mosaic from the built environment of construction to the virtual environments, characteristic of our highly interconnected world. This kind of additive synthesis contributes to the unfolding of mosaic in digital technologies as means of visualising data, which is well-suited to a constructive method of image production. In the advent of computers ordering information visually and the adoption of a virtual environment as a base for human-computer interaction, mosaic principles provided the solution. The so-called *virtual environment* is necessarily a visual one, and, with its construction of images through the manipulation of independent units of light, a modular approach was well suited to the task. Furthermore, the architectonics of a digital graphic environment is comparable to Byzantine parietal mosaic, both sharing an underlying structuring method and use of glass. However, a crucial difference between digital technologies and Byzantine mosaics is found in the way in which light is manipulated. In medieval times, light was "captured" by glass tesserae and carefully modulated to create images that did not reflect light in the same way as a polished mirror surface; the inclination of the tessera played a major role in defining the image. In digital technologies, such as television screens and computer monitors, light is also harnessed to great potential, but manipulated quite differently; light passes through glass, and it is not reflected by it. However, both electronic screens and Byzantine mosaics reveal how pure colour, or light itself, is manipulated by an additive synthesis.

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[102] The influence of mosaic in painting is developed in chapter four and in sculpture it is developed in chapter five and six.

[103] The *in-betweenness* of mosaic is important as a concept for application in interdisciplinary research, a topic that is not the main concern of this thesis. It deserves further investigation and an extensive analysis within a separate piece of writing.

The mosaical within digital technologies makes significant use of the organisational principle of the grid, or the *opus regulatum,* which is the earliest example of the grid within mosaic work. As mentioned previously, the grid offers an efficient way to order a surface and create a pattern, it has objective and scientific connotations, and in current digital technologies, addresses the issue of image resolution by offering a form of standardisation. Artist and researcher Daniel Rozin (2013) has an interesting remark on this subject:

> When we talk about imagery, when we talk about pixels, we're talking about a system that has had to be standardized[sic]. And with this standardization comes the compromise of set resolution. In mosaic, there's a person's eye that is making these decisions, that's guiding the attention of a viewer by the treatment given to one detail or another (Rozin cited in Holmes, 2013:44).

Computer technologies had to compromise from the outset, and early computer graphics faced a problem regarding the creation of refined images. While old computers generated jagged, low-resolution images, this issue with image resolution was not unique to computer technology but had emerged within earlier mosaic works.[104] In the Hellenistic period the issue with image resolution was tackled in mosaic through the use of minute size tesserae combined with a fine line-based andamento known as *opus vermiculatum*. The mosaicist approach was different in the way of refining the image as in this case they adopted an andamento not based on the grid.

> If you look at a stone mosaic, you'll find many areas of the background where the stones need to be side by side in a rectangular grid [*opus regulatum*] – but when you look where the mosaic artist is trying to create features and contours of figures, they couldn't live with that, and the stones are rotated or chopped up into irregular shapes [*opus vermiculatum* and other *andamenti*]. There is the idea of the pixel in mosaic, but it is not strict pixilation (Rozin cited in Holmes, 2013:44).

Rozin is correct in noting that mosaic with its multitude of *andamenti* does not adhere to the strictures of pixilation. This is due to material constraints; in mosaic work the issue of pictorial resolution was resolved by the adoption of a line-based[105] approach, According to Marks, early television technology also experimented with a line-based method to generate images: the raster. Nonetheless, more recently

> [...] the digital screen replaced [the raster] with the mosaic-like array of pixels, converting the line to a series of samples. [...] With the exception of Flash type

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[104] The relationship between image resolution and the mosaical is further discussed in chapter seven, in combination with Hoy's concept of digitality.

[105] It is worth noting here that a line-based mosaic andamento is always fragmented.

graphics, vector graphics have been mostly surpassed by the pixel-based image (Marks, 2010:67).

In this way, it is evident that the principle behind the ancient approach to image resolution is comparable to recent attempts to address the same issue; in both instances, the smaller the unit (tessera or pixel) the higher image resolution is obtained. Images constructed using partible units are only more realistic and life-like if the units are small enough to go unnoticed by the eye, meaning that the image is wholly formed in the brain through the retina.

Whether digital technologies inherited this cue from either art or science alone is a minor issue. As discussed previously, Western culture has tended to compartmentalise knowledge, which has affected the way we, in the West, study the world. However, as also noted previously, art, science and technology are not necessarily independent from each other and can certainly be seen as having considerable unity when it comes to experimenting with or manipulating nature and the environment. This seems particularly pertinent to considerations of the ways in which digital technologies allow *techne* to be understood in its most encompassing sense: art and technology in unison, or, in Barilli's terms, the convergence of the *material* and the *ideal strata*.

It is correct to conclude that the majority of image production today is structured through the principles of mosaic making, with a grid-like arrangement evidently predominating across areas such as graphic art, digital cinema and 3D printing. Furthermore, the organisational principles of mosaic, its ordering of surface, has been extended from pictorial art and architectural vestment into computer-based technologies. In this sense, mosaic can be interpreted as the visual layer between an underlying code and our built environment – both the actual and the *virtual*.[106] Hence, while the mosaical is everywhere, it is, in fact, nowhere to be seen. Mosaic is now extensively existent as *a layer invisible to human perception*, aiding the transformation of code into the visual, in both two and three-dimensional forms. Concern with this aspect of mosaic practices opens this thesis to a wider concern: how did mosaic principles enable the passage from the actual built environment of construction to the image-based virtual environment of digital technologies? So far, this research has been able to trace the mosaical as a way of structuring the visual and yet the answer to this particular question cannot be fully articulated within the scope of practice-based research in fine art. However, the answer becomes evident within the paradigmatic shift

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[106] 'Lame virtual' according to Marks (2010:65).

in cultural analysis advanced by McLuhan's seminal work and expanded upon by Barilli, among other authors. These analyses suggest that, while in its reduction of information to codes and rules of combination the digital seems opposed to the idea of a medium, the visualisation of such data is necessarily materialised as an electronic mosaic, which has become so commonplace in our interconnected world that the tendency is to overlook the intrinsic mosaical condition of the digital output of images. The naturalisation of digital images is a legacy of the Renaissance mode of picturing, which is still so pervasive and continues to marginalise the neo Byzantine structuring mode despite its evident significance within contemporary visual culture. In contrast, a mosaic-centred view of contemporary visual culture serves to contextualise and locate the methodological framework of the present research in art practice, exemplified by the research model below (fig. 3.12).

The *Mosaic Research Model* diagram does not represent an expanded field of practice. It offers an overview of the influence of mosaic principles across several fields, articulated throughout the thesis. As a model, it places mosaic at the centre of a sensorial world where tactility and the haptic prevail. On the left-hand side, it concentrates on two-dimensional disciplines, suggesting an infiltration of mosaic principles in these areas of knowledge. On the right-hand side, it illustrates the influences of mosaic on three-dimensionality. The centre part of the diagram offers a temporal axis highlighting the contribution of mosaic to the passage from the built environment of construction (past) to the virtual environment of digital technologies (present). The centre column can also be interpreted as highlighting the return of pre-modern ways of sensing in contemporary experience within the Electronic era, or post-modern, based on mosaic principles as envisaged by McLuhan.

In sum, this chapter has reconceptualised mosaic by articulating cognate concepts such as the grid and *kunstwollen*. It has demonstrated how the modulation method, an attribute of mosaic in the material stratum, and its relational aspect additive synthesis, has been explored symbolically (ideal stratum) and has contributed to the understanding of mosaic as a means of structuring the visual beyond medium specificity. These notions enable this thesis to advance a new concept of mosaic for contemporary use that is pertinent to contemporary fine art practice and criticism, namely the **mosaical** framework for production and analysis.
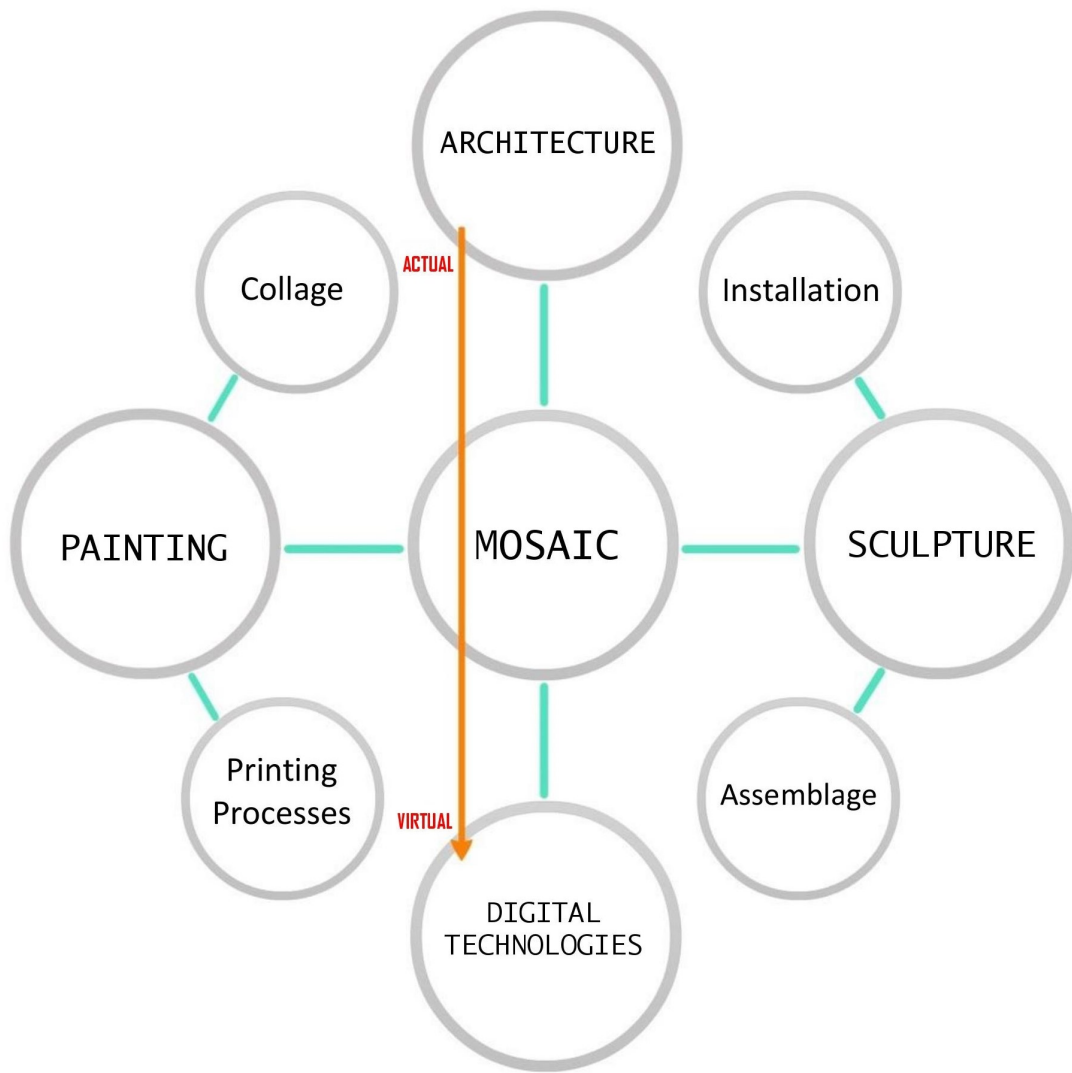
Fig. 3.12. de Melo. *Mosaic Research Model* (2018)

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PART TWO: ENFOLDING AND DEVELOPMENT

Chapter Four: Repackaging the Tessera for Modernity

Following the contextual and methodological overview set out in part one, and the elaboration of a conceptual framework for the analysis of the mosaical and its historical ramifications, the second part of this thesis addresses a moment in history within which mosaic principles *enfold* and become a language applied to painting and further developed three-dimensionally within sculpture, specifically the historical avant-gardes and American Minimalism. This account functions as a *re-historicising of events,* which is triggered by traces of a submerged narrative latent within the graphematic space of my *experimental system*. Within part two, the present chapter takes up a specific area of exploration; how the elemental units of composition characteristic of ancient and medieval mosaic practices are developed in Modernism and thereby infiltrate painting practice. This enfoldment can be divided into two homologous areas. The first of these refers to France and reveals how ideas about colour mixture came to the fore. There is specific reference here to painting and the influence of additive synthesis, which is characteristic of mosaic making, alongside consideration of ideas regarding aesthetic responses to simple perceptual elements, which came to play an important role in art. The second of these parallel threads refers to Russia and shows how the Russo-Byzantine revivalism of the 19th century gave rise to artists guided by mosaic making through practical work involving fresco and mosaic restoration in churches in several locations. It is important to note that, while these points of interest may seem geographically separate, this interest in elements of composition associated with mosaic did not occur in isolation, rather the two areas accounted for here reflect a broader cultural climate that affected other locations in Europe. Chapter four adds to this through an examination of works by members of the Bauhaus in Germany and the group *De Stijl* in the Netherlands, paying particular attention to the work of Johan Thorn Prikker and his connection to both Josef Albers and Piet Mondrian.

Colour Theories in France

According to Sjåstad, it is likely that Ogden Rood's writings had great influence on Seurat (figs. 4.1 & 4.3) and the Neo-Impressionists.

Optical mixing became one of the hottest subjects in Impressionism and Neo-Impressionism, and it is plausible that Seurat tried to follow these concrete observations from Rood's writings on chromatics compositions (Sjåstad, 2014:103).

In his book, Sjåstad offers a convincing analysis of the evolution of the painted touch or tache and Rood's influence on Post-Impressionism, through a comparison of Divisionist methods of colour mixture. The juxtaposition of colours and how they work together was important to Rood, as he aimed at obtaining a lighter, optical colour mixing instead of pigment mixtures.

Original in Colour

Fig. 4.1. Seurat. *The river Seine at la Grande-Jatte* (1888)

Original in Colour

Fig. 4.2. Signac. *The Port of Saint-Tropez* (1901)

For Sjåstad (2014:115-116), the laws of Divisionism decree that colours should not be mixed on the palette and 'every brushstroke, taken pure from the palette' should maintain its purity on the canvas. According to this approach, contrasting colours should be juxtaposed 'so that the painting will be harmonious [...] producing a harmony of an intellectual order.' The principles of Divisionism regarding optical mixing and harmonic contrasts generated a *mosaic* effect in paint application. Furthermore, the adoption of a style based on mosaic provided the artists with 'a more decorative style and to a reconstruction of a motive;' a methodology based on 'breaking down before building up.' In this sense, Divisionism was based on mosaic principles of composition where 'the hand's movement should be mechanical' and its control was extremely important in opposition to 'a playful sloppy touch.'

Sjåstad (2014:116) equates the mosaical strategies of Divisionism with Constructivism and Cubism, tracing these influences back to John Ruskin's book *The Elements of Drawing* (1857). This connection is also made by Rood, whose '*Modern Chromatics* (1879) made several references to Ruskin's writings,' (Sjåstad, 2014:103) including a significant passage on how Ruskin directed the painters to colour their work like a mosaic maker through the application of separate patches of colour:

> In filling up your work, try to educate your eye to perceive these differences of hue [...], and lay them deliberately, like a mosaic-worker, as separate colours, [...] to be fitted neatly by its edge to the next patch (Ruskin, 1857:213).

This passage also finds its way into the writings of Paul Signac, who consequently proliferated ideas intrinsically connected to mosaic making. In fact, the principles of mosaic take centre stage in Signac's Divisionist method (figs. 4.2 & 4.4). He even cites Ruskin's defence of mosaic as an answer to critics.

> One must consider all nature purely as a mosaic of different colours which one should copy one by one in all simplicity. Is it frescoes then that one should produce? Yes, and better yet, mosaics (Signac, 1921 [1899]:272).

Signac's book *From Eugéne Delacroix to Neo-Impressionism* (1899)[107] became the introduction to Modernism for several artists including Jean Metzinger, Robert Delaunay, Wassily Kandinsky, Piet Mondrian, Gino Severini and Henri Matisse. Sjåstad also associates mosaic strategies with Paul Cézanne's modulation method, as

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[107] It was first published in French as *D'Eugène Delacroix au néo-impressionnisme*.

discussed in chapter three of this thesis, Seurat's Pointillism, which finds its way into Russian Constructivism,[108] Cubism and the *De Stijl* movement in the Netherlands.

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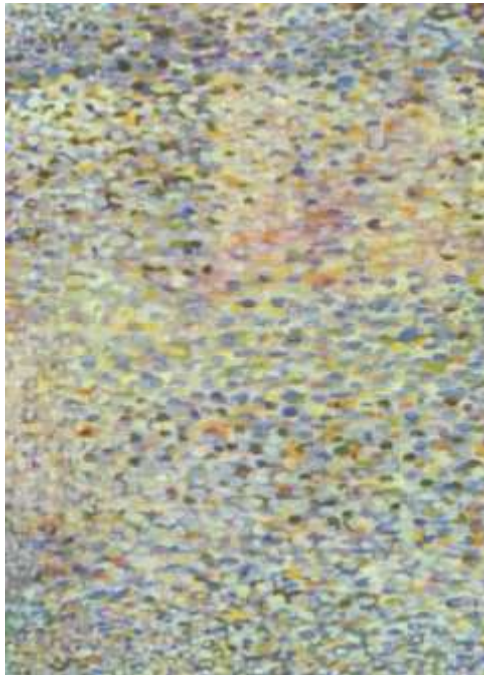
Fig. 4.3. Seurat's brushwork (1888)　　　Fig. 4.4. Signac's brushwork (1901)

Through Sjåstad's well-structured narrative, it is clear how Neo-Impressionism turned brushwork into a building block, meaning it operated very much like a tessera. Colour tints were not mixed on the palette, or the surface of the canvas, but in the retina. 'One of Rood's main points was to make clear that colour is made of light; that is, that impressions or sensations are made of light' (Sjåstad, 2014:103). In this sense, brushwork became a building block and the painter used it very much in the same way that a mosaic worker might use it; the act of construction was closely related to the workings of the hand rather than the brain. It is a 'connotation to mosaic [that] also creates a further link to the Neo-Impressionist's wish to be a craftsman rather than artist' (ibid:116). For these artists, this method of working with building blocks appeared to be a less intellectual act, which was thereby seen to connect the artist with the masses. 'The Neo-Impressionist artists wanted to be artisans [by drawing] parallels between themselves and common workers' (Ibid:108).

According to Herbert (1968:24), the mosaic qualities in Seurat's and Signac's work (see figs. 4.3 & 4.4) were developed further in a 'second flowering' of Post-Impressionism.

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[108] Russia offers another mosaic line of influence, discussed further along in this chapter.

Herbert argues that Jean Metzinger and Robert Delaunay developed a Post-Impressionist *sub-style* with robust daubs of paint, or taches, that 'had great significance' for their later Cubist works. They became key figures in the achievement of a more abstract method. According to Torcellini (2017:45), Metzinger and Delaunay were not the only ones; 'there were also other artists who developed a pictorial style that was explicitly mosaic in form.' In fact, Metzinger was one of the first major theorists of Cubism[109] to consider the structure of brushwork. In 1906, Louis Chassevent suggested that the word 'cubism' was historically linked with the qualities of Metzinger's painted tesserae (see figs. 3.10 & 4.6); 'M. Metzinger is a mosaicist like M. Signac but he brings more precision to the cutting of his cubes of color' (Herbert, 1968:221). It was with the works of Metzinger, Delaunay and Cross that the term 'cube' first appeared in the history of painting, a direct reference to the materiality of a tessera and its visual-tactile properties.

Original in Colour

Fig. 4.5. Delaunay. *Landscape with Disc* (1906-1907)

According to Buckberrough (1982:9-10), the source of the block-like daubs in painting is not certain, although Delaunay seemed to have adopted the style of 'robust blocks of colour' from Cross. For Gage (1999:255), Delaunay's mosaic painting style 'of close-packed cubes' evolved from the Pointillist dot, maybe as a reaction against the greying

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[109] Alongside Albert Gleizes.

effect caused by Seurat's Pointillist technique, as suggested in chapter three. Delaunay shared Metzinger's interest in capturing 'iridescences and certain aspects of colour still foreign to painting' through the 'divided brushwork' that rendered their work more abstract. For Buckberrough (1982:16), *Landscape with Disc* (1906-1907) is a clear 'summary statement of Delaunay's discoveries concerning light and color[sic] up to 1907' (fig. 4.5), paralleling Metzinger's vibrant rendering of the sun in *Sunset n.1* (c. 1906) (fig. 4.6). For Herbert (1968:209), 'Delaunay offers the best example of the direct links between Neo-Impressionist painting and theory, and Cubism of 1911-1914.'[110]

Original in Colour

Fig. 4.6. Metzinger. *Sunset n.1* (c. 1906)

According to Gage (1999:255), Delaunay studied stained-glass 'at Laon, where he worked in 1907 and again early in 1912,' which extended his interest in luminosity to encompass transparency. While Delaunay's mosaic-style period was shorter lived than Metzinger's, he applied his knowledge of stained-glass in the development of a new series of painting referencing windows, 'where the technical problems of conveying transparency were addressed for the first time' (ibid). For Herbert (1968:231), it is significant that Delaunay's brushwork loosened ties with expressive colour theory and 'exploited [colour] for its own sake.' Herbert suggests that the luminous *stained-glass paintings* displayed Delaunay's sustained interest in a Divisionist method that

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[110] Note that even though Cubism and Fauvism are painting movements that evolved within the context of the influence of mosaic principles in painting, and within the scope of this research, they are not developed within the thesis.

associated luminosity with a particular kind of structure, paralleling Cubist paintings of the same period by Braque and Picasso. For example, in *Window on the City*, n.3 (1910-1911) (fig. 4.7), Delaunay's mosaical approach to painting reinforces a particular luminosity that exists in the material qualities of stained-glass and glass mosaic works. For Gage (1999:255),

> [...] the whole surface has been treated in the chequerboard manner [opus regulatum], and there is little doubt that Delaunay was concerned to render an all-over transparency by means of the phenomenon of *lustre*. [...] well described by [...] Rood, in *Modern Chromatics*.

Original in Colour

Fig. 4.7. Delaunay. *Window on the City*, n.3 (1910-1911)

Delaunay's interest in using colour modulation through an additive method of composition found a symbolic return in his engagement with actual mosaic making (fig. 4.8). According to Renée Antoine Malaval (2015:63-65), towards the end of his career, after years of painting, Delaunay created a series of mosaic reliefs, a move that was prompted by his evolving interest in the integration between art and architecture. As a defender of *pure painting,* in a Divisionist sense, and aspirations to 'free painting from its framed constraints' by reorganising it within urban spaces, Delaunay saw these mosaic reliefs as a natural progression from his painting practice. While a few existing documents mention these mosaics, there is no reference to them in the records held by the Robert and Sonia Delaunay Foundation at the Museum of Modern Art and they

are also overlooked by Fraenkel's documents on Delaunay's relief sculptures. Despite these significant absences, these works came to light through an exhibition at the Musée Pompidou in Paris in 2014.

Original in Colour

Fig. 4.8. Delaunay. *Mosaic Relief* (c. 1935)

In the familiarity of modulating the surface of a canvas with units of colour and the tactility embedded in his paintings, Delaunay seems to have found an authentic manifestation of luminosity and structure in his mosaic reliefs. His return to the materiality of the tesserae as precursor of the Divisionist method indicates that his luminous practice came full circle. Actual mosaic making was possibly an inevitable consequence of his aspirations. In this way, Divisionist painting seems to have generated a renewed interest in mosaic making and given licence to other artists interested in engaging with such practices, such as Gino Severini and Johan Thorn Prikker, among others.

The Icon and the Tessera in Russia

The other important line of influence of mosaic principles in Modernist painting is connected to the Russo-Byzantine revivalism that occurred after the Crimean War of the 1850s. Until then, according to Taroutina (2013:16-23), the Enlightenment had denounced the legacy of Constantinople and with the revivalism in Russia, the Byzantine tradition became a model for artistic experimentation and a source of Slavic identity.

> For many young talents, Russo-Byzantine visuality not only provided a compelling pictorial alternative to the then pervasive nineteenth-century naturalism still propagated by the European Academies, but it likewise offered a divergent formal and conceptual genealogy to ascending French Modernism. Consequently, the Russo-Byzantine revival not only redefined the course of Russian art history, but arguably played a crucial role in catalysing[sic] Russia's contribution to international Modernism (ibid:13).

Original in Colour

Fig. 4.9. Vrubel. *The Demon Seated* (1890)

In this respect, for Taroutina, the main influential figure in Russia is Mikhail Vrubel who is considered the 'first truly revolutionary Russian artist' (ibid:67). According to her, Vrubel strived to modernise Russian painting in accord with 'formal and technical developments in European art,' specifically pictorial flatness, spatial ambiguity and the use of broad brushwork (figs. 4.9 & 4.10).

> [Vrubel's] formal innovation with visionary transcendentalism, [...] paved the way for the subsequent generation of artists such as Kazimir Malevich and Wassily Kandinsky, for whom abstraction and the transcendental came to represent two sides of the same Modernist coin (ibid:72).

Taroutina (2013:78-81) claims that Vrubel anticipated Cézanne with his 'forward-looking Modernist style' by engaging 'with the restoration of frescoes and mosaics of St. Cyril in Kiev' and by studying 'the mosaics in St Mikhail Monastery and the St. Sophia cathedral.' Vrubel also restored mosaics in the cupula of St. Sophia (Kiev) by imitating the tesserae in paint instead of using glass. According to Karg (2015:49), Vrubel studied 'Byzantine and Venetian mosaics' during a visit to Italy in 1885, a fact that influenced his design vocabulary and its emphasis on abstraction. 'He synthesized the Byzantine tradition of icon painting and mosaics with Symbolist forms to create his own artistic language.' For Taroutina (2013:80), Vrubel consciously copied tesserae into his paintings, adhering closely 'to the medieval prototypes, imitating their penchant for bright color[sic], flatness, pronounced outlining and spatial ambiguity' (fig. 4.9), and consequently producing works very much like Cézanne's. For Karg (2015:49), Vrubel invented 'a mosaic-like manner of painting.'

> [Vrubel's] stylistic characteristics [... which] hold an apparent resemblance to Cézanne's color[sic] patches, were, in fact, arrived at by Vrubel independently through a close imitation of mosaic tesserae (Taroutina, 2013:81).

Original in Colour

Fig. 4.10. Vrubel's Brushwork (1890)　　　Fig. 4.11. Cézanne's Brushwork (1904)

At close inspection, in both Vrubel's and Cézanne's work, tesserae are not fully converted into brushstrokes (figs. 4.10 & 4.11). However, their modular method of applying paint to canvas brought a high level of abstraction to painting, leading art critic Nikolai Kulbin (cited in Taroutina, 2013:105) to 'boldly [assert] that the founders of Cubism were: Cézanne in France and Vrubel in Russia.' Taroutina (2013:72-73) cites a

legendary account from the artist Sergei Sudeikin, which describes how a few weeks before making sketches for his paradigmatic work *Les Demoiselles d'Avignon* (1907) (fig. 4.12) the young Pablo Picasso spent hours at the Parisian Salon d'Automne of 1906 standing in front of Vrubel's works carefully studying these seminal paintings.

Original in Colour

Fig. 4.12. Picasso. *Les Demoiselles d'Avignon* (1907)

Taroutina reviews how the Russian return to a Byzantine past is proposed as a political strategy to establish a distance from the aggressive West. Vrubel's paintings, consequently, became of great importance for the art criticism of the left and he was claimed as 'the mythical origin' of the Soviet avant-garde project. Not only was the idea of the painted tessera as a constructive and compositional element important in this respect, but also the idea of the icon itself. This is linked to the spirituality deeply rooted in the Russian consciousness, which is seen as a catalyst for Kandinsky's writings and abstract paintings and has meant that Vrubel has influenced a whole generation of artists such as Kazimir Malevich, Vladimir Tatlin, Aleksandr Rodchenko and Naum Gabo. For Hardiman & Kozicharow (2017:20),

Vrubel was the most radical in combining his interest in religious art with formal innovation, moving even further beyond the official canon of the Orthodox Church. Vrubel's experimentation in media such as mosaic informed his ground-breaking paintings of the 1890s.

For Taroutina (2013:106), Vrubel's paintings offered broken compositional elements, geometry and textural *fracture*, all peculiar constructive effects that fuelled a drive towards abstraction that occurs in Russian avant-garde art. According to Reeder (1976:333-334), Naum Gabo claimed that

> Vrubel freed the arts of painting and sculpture from the academic and realist schemata. [...] [and] revived the concept in visual art that the fundamental visual elements are of decisive importance in the creation of a pictorial or plastic image. [...] His influence on our visual consciousness was as decisive as Cezanne's.

For Karg (2015:55), Vrubel's 'creativity and innovation provided a guiding role model for many representatives of Russian Modernist art.' Taroutina (2013:106) describes how Malevich 'encountered Vrubel's work in Kiev in the early 1890s' and consequently the world was confronted with *Black Square* (1915) at the *0.10 Exhibition* in Petrograd (fig. 4.13). Importantly, Malevich's *Black Square* was upsetting to both public and critics for assuming the position of the icon.

> [The work] was not only engaging with the distant medieval Russo-Byzantine past. Rather, it was the latest iteration in the very recent history of multiple avant-garde reiterations of the icon (ibid:1).

Fig. 4.13. *0.10 Exhibition*, a section of Suprematist works by Malevich (1915)

It is possible to conclude that the Russian icon became aniconic through Malevich's gesture, paralleling itself to the non-figurative tradition of Islamic art, which, according to Marks (2010:52), had its origins during an iconoclastic phase of the Byzantine Empire. Hence, the aniconic element of mosaic making unfolded as Russian abstract painting and, within the context of this thesis, *Black Square* can be interpreted as the manifestation of a single, purified painted tessera. According to Punin (cited in Taroutina, 2013:108),

> [t]here is not a single new formal element in the "new art", which has not already been articulated in the past. What is innovative in the "new art" is a genuinely novel understanding of the world: it is not the form that is new, but the content.

Malevich also toyed with the idea of tessera-size works, his smallest is one of his *Architekton Elements* (c. 1924), made from paper mounted with plaster on cardboard, measuring only 2.8 x 2.8 cm. This tessera-size work belongs to the collection of the *Musée National d'Art Moderne*, Centre Pompidou, in Paris. It was exhibited at the Stedelijk Museum Amsterdam in *Kazimir Malevich and the Russian Avant-Garde* (2013-2014) and the label beside the work stated that it was Malevich's smallest black square. It is reproduced here in its actual size (fig. 4.14).

Fig. 4.14. Malevich. *Architekton Elements* (c. 1924)

According to Mikhienko (2003:79), the Suprematist vocabulary of basic compositional elements, such as the square, the circle and the cross, developed in Malevich's paintings emerged as a series of *architectural* models. Malevich concluded that painting had become obsolete and his 'search for an ultimate nonobjectivity, entered the sphere of architecture'. His *Formula of Suprematism* (1925-1926) shows how the square becomes an architectural cube (fig. 4.15) that can be developed in modular architectural compositions such as in *Spatial Suprematism* (1925-1926) (fig. 4.16), hence, evidencing how the tessera element that enfolded within Vrubel's paintings unfolds into Malevich's Architektons.
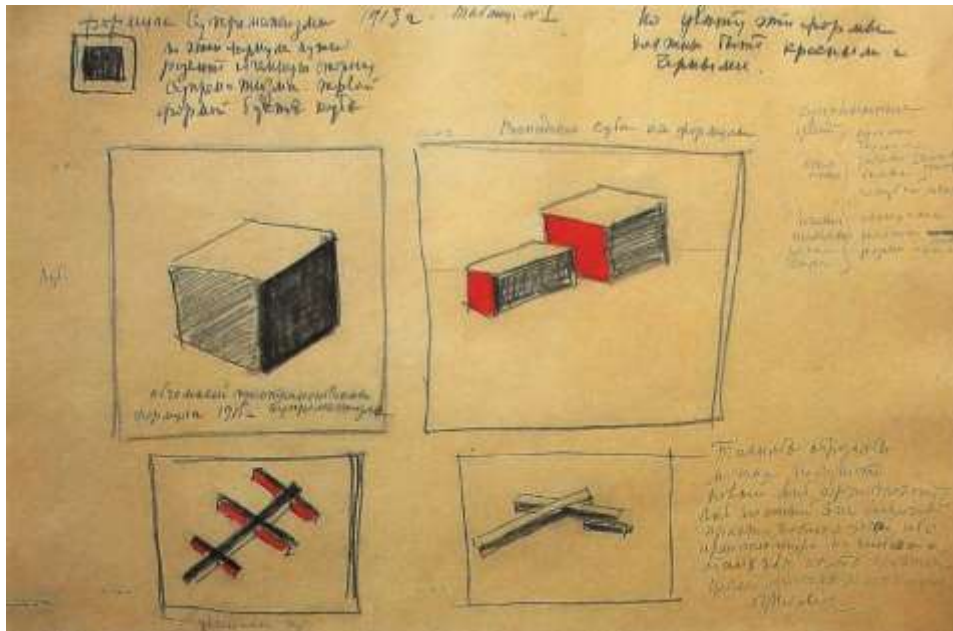
Fig. 4.15. Malevich. *Formula of Suprematism* (1925-1926)
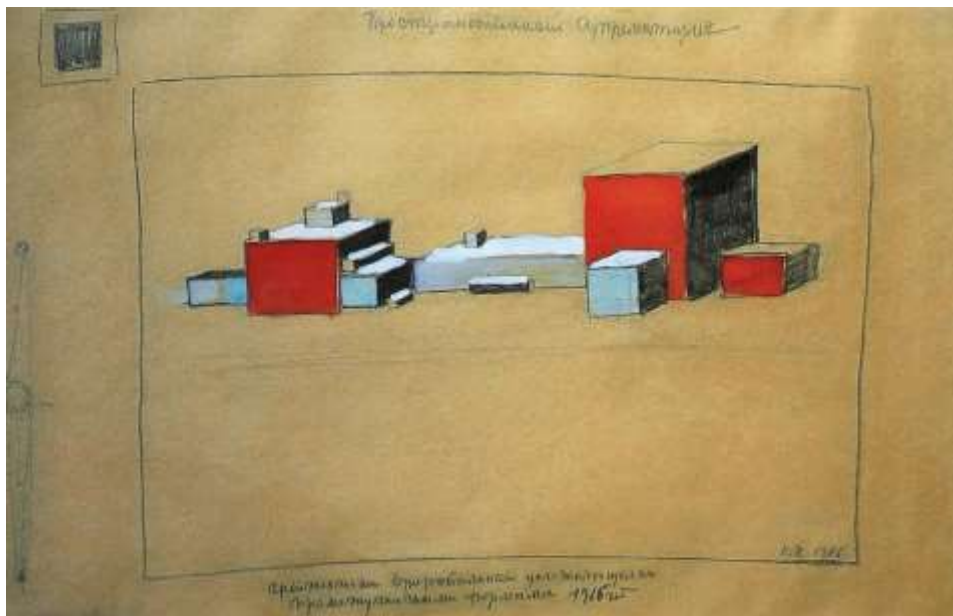
Fig. 4.16. Malevich. *Spatial Suprematism* (1925-1926)

Another curious comparison can be made between Malevich's Suprematist compositions and mosaic work. The similarities between his *Suprematist Composition* (1915) and an ancient mosaic floor at Villa Poppaea are striking (figs. 4.17 & 4.18).

The mosaic known as *opus scutulatum* is created with irregular pieces of geometrically-shaped coloured marble or stone set in cement or tessellated background areas that create the impression of scattered shapes in space, very much like Malevich's Suprematist canvas. While excavations at the Vesuvian site of Oplontis began in 1839,

this specific mosaic floor in the Oecus (room 15) of Villa Poppaea did not come to light until the second half of the 20th century (SANP, 2007:online). Therefore, it is unlikely that Malevich had seen it. Nevertheless, there is a strong visual resemblance between this particular *opus scutulatum* and Malevich's piece. It could be argued that this similarity is due to the additive nature of these compositions and their dependence on elemental formal units. On the one hand, the visual quality of the floor mosaic is a result of the possibilities and limitations of the technique, the material constraints. On the other, Malevich's Suprematist compositions are the result of his artistic research into the nature of painting itself, and are influenced by predecessors such as Vrubel with a direct connection to mosaic making. Malevich is one of many artists who have tapped into a particular organisation of the visual that sprang up as a consequence of the constructive strategies foregrounded by both Russian experiments with painted tessera and Post-Impressionist divisionism. In this way, Malevich's works manifest a separation of compositional elements that creates visual effects very similar to those of the Oecus floor at Poppaea. While the mosaic pertains to the technical stratum and Malevich's work to the symbolic, both are manifestations of a similar visual configuration, creating their own rhizome. This exemplifies yet another instance of the enfolding and unfolding of mosaic principles within a historical horizon or a plane of immanence, thus breaking down the hierarchical order prescribed by normative Art History. For Marks (2010:27), 'being enfolded is often a strategy for survival, for concepts as much as for pots [or mosaics] buried in the earth.'

Original in Colour

Fig. 4.17. Malevich. *Suprematist Composition* (1915) Fig. 4.18. *Oplontis Mosaic* (1st c.)

Byzantine Modernism

This chapter has emphasised the ways in which mosaic principles and the Byzantine mode of representation became a driving force in Modernism. The article 'Mosaics Old and New' (1941) by Rudolf Arnheim is instrumental in this respect. His schematic drawing offers a clear visualisation of the process (fig. 4.19).
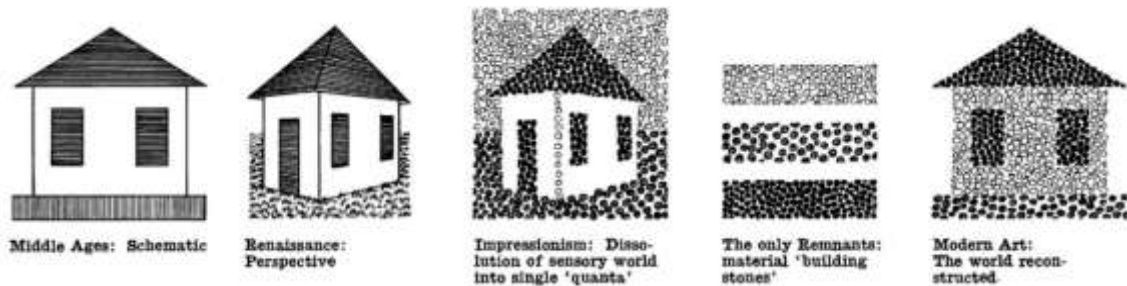
Fig. 4.19. *Arnheim's Modes of Representation* (1941)

In Arnheim's representation, Impressionism dissolved the sensory world into single quanta and offered these to subsequent artists as compositional building blocks.

> When the technique of illusionistic representation reached its final stages, where the material world was dissolved into a multitude of color[sic] patches on a surface, these color patches fulfilled a dual function: they were intended to melt into one glimmering image but also to keep their identity as separate units, as material 'quanta' out of which the artist had built his world. And since the dissolution of reality had brought illusionistic representation to an end, nothing was left to the artist except the elements of his technique: the mere abstract, empty forms […]. Out of these building-stones the artist began once again to construct the world (Arnheim, 1941:72).

The appearance of sensory quanta signals an important point in the history of Western art, which Arnheim suggests fuelled 'the dialectic change-over from Impressionism to Constructivism' (ibid:73). In this, Arnheim describes how the new building blocks 'were abstract from the viewpoint of representation, but concrete from the viewpoint of construction' (ibid). According to Gage (1999:84), 'several writers of the ninth century play on the dual identity of mosaic, as material and as representation' thus highlighting the convergence of the material and the symbolic strata in mosaic work. Consequently, the dialectic turning point in Modernist art proposed by Arnheim maintains its connection with wall and vault mosaic where 'there is no contradiction involved if Byzantine art spiritualizes its representations by revealing that they are built out of material elements' (1941:72). This convergence is very much at the fore of the Russian

avant-garde project with its development of a visual language based on elemental units of composition. In this way, it is evident that the tessellated nature of mosaic inspired optic studies in antiquity, and that there is a subsequent reversal of this trajectory when painters begin applying colour theory to their work at the end of the 19th century and beginning of the 20th with the progressive transformation of the tache into a cube in France, and the hands-on experiments in Russia that turned the tessera into a single, purified painted unit, the aniconic *Black Square* (1915).[111]

Taroutina's narrative proposes that an interest in the Byzantine tradition is evident in the United Kingdom, often known as Orientalism. For example, a Byzantine influence is found in the Arts and Crafts movement of the 1880s, largely, it seems, as a result of John Ruskin's writings.

> John Ruskin's sympathetic account of Veneto-Byzantine architecture in his seminal publication of 1851-53, *Stones of Venice*, led to a growing public interest in the history and cultural production of Byzantium (Taroutina, 2013:17).

The interest in the Byzantine tradition expressed through the British Orientalism of the 19th century, the Russo-Byzantine revivalism and the mosaic-inspired colour theories deployed by painters in France created a climate within which mosaic principles unfolded into painting, marking its presence in the foundation of Modernism. In addition, it is important to note the idea of Post-Impressionism as a return to a Byzantine past was first introduced by Roger Fry in 1908 in defence of a negative critique in the *Burlington Magazine*, when the works of Signac, Gauguin, van Gogh, and Cézanne went on display at the International Society in London (Betancourt & Taroutina, 2015:2). According to Taroutina, Fry

> [...] recast the most cutting-edge French avant-garde movement of the late-nineteenth century as an essentially Byzantine revival; one that self-consciously shifted the representational paradigm, much like Byzantine art had done centuries before (ibid).

Consequently, the unfoldment of the tessera as brushwork is a phenomenon that occurred beyond the borders of specific countries such as Russia and France. The mosaical flows through Vrubel, Cézanne, and a considerable number of artists such as

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[111] The development of tesserae into sculptural units is discussed in chapter five.

Seurat, Signac, Malevich, Tatlin, as well as Gustave Klimt[112] in Austria. For Taroutina (ibid:8),

> [the] multiple and pervasive "Byzantine parallels" were not merely accidental or isolated incidents, but were in fact conscious dialectical strategies for Modernist self-definition.

Furthermore, through additive synthesis, the influence of the tessera was also felt in technology; the mosaical unfolds as technological advances in printing processes, which bring to the fore the Byzantine mode of representation and its fragmented iconicity and predict television and data visualisation in digital technologies. For Torcellini (2017:45), at the end of the 19th century, 'the mechanism of operation of images and the visual system itself is consistently […] of a mosaic type.'

If the in-betweenness of mosaic is considered, that is the ability to render a mosaic as flat as a painting or as three-dimensional as a sculpture, it is peculiar that when painting is re-evaluating itself at the end of the 19th century and moving away from the constraints of realism and pictorial perspective, a legacy of the Renaissance, avant-garde artists deployed compositional strategies closely related to mosaic making, rather than painting itself. In this sense, mosaic principles became quite subversive and avant-gardist. This is not an isolated late-nineteenth-century occurrence. It also informs the practices of 20th century artists who employed mosaic principles within the Italian avant-garde and American Minimalism, within a moment when sculpture was also re-evaluated.[113] Furthermore, consideration of the enfoldment and unfoldment of mosaic principles in and out of history points towards a deeper understanding of contemporary visual culture and art practice and its connections with the Byzantine mode of representation, an idea championed by a growing number of theorists such as Abadal, Barilli, Roland Betancourt, Elena Lamberti, Torcellini, Taroutina, among others who are influenced by McLuhan's seminal work *The Gutenberg Galaxy*.

Mosaic, Painting and Stained-Glass

The interest in the development of luminous qualities in easel-painting, triggered by colour theories in France, spread across Europe and had strong links with the

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[112] The influence of mosaics in Klimt's work is prominent. However, it is a connecting thread that is not developed in the context of the thesis.

[113] Discussed in chapter six.

experiments of the Russian avant-garde. Furthermore, the constructive methodology derived from mosaic making became influential in the teachings of the Bauhaus and the practice of the *De Stijl* group in the Netherlands. This generated a renewed interest in stained-glass compositions as well as actual mosaic work. For example, Chevreul discussed stained-glass in his book *The Laws of Contrast of Colours* (1857) and Rood took up the subject in *Modern Chromatics* (1879), and these texts subsequently influenced artists such as Delaunay, Klee, Prikker, Albers and Mondrian.

According to Drostle (2002:86), Gropius announced the creation of a workshop for 'stained-glass painters' and 'mosaicists' in the Bauhaus Manifesto. The glass workshop was initially set up independently of the Mural Painting workshop but was combined with it in 1924, due to a lack of productivity. In 1922, Klee became a Master of Form in the coloured glass workshop but did little in actual glass production. The more fruitful compositions in glass came from Albers, who became a Master of Craft in 1923 and, as Eskilson (2018:52) points out, perceived stained-glass as 'a kind of experimental painting medium.'

Original in Colour

Fig. 4.20. Klee. *Mosaic Study* (1925), courtesy of Zentrum Paul Klee, Bern

Klee, an admirer of Delaunay (Gage, 1999:257), was interested in developing his own painterly vocabulary and experimented with luminosity and structural rhythms. For Düchting (1997:68-70), Klee's 'studies of structural rhythms' and the mosaic-like arrangements of his early Divisionist pictures further compelled his interest in actual

mosaic work. This observation is further supported by one of Klee's letters to his wife in which he mentions beginning to experiment with brushworks and colour modulation after seeing a mosaic made by one of his pupils at the Bauhaus. In 1926, Klee travelled to Italy visiting Ravenna and its mosaics, an experience that 'lastingly influenced his form' (Story & Gilvarry, 1967:14).[114] Grohmann (1985:96) makes a more assertive claim in this regard, stating that 'in his Divisionist period [Klee] actually painted mosaics.'

Figs. 4.21 & 4.22. Klee. *Castle Garden* (1931) and *Artistic Symbiosis* (1934)

According to Verdi (1984:195), Klee favoured 'building up his pictures according to a principle of structural articulation.' In fact, this device is evident in Klee's well-documented series of mosaical paintings and drawings, such as *Mosaic Study* (1925) (fig. 4.20), *Castle Garden* (1931) (fig. 4.21), *Athlete's Head* (1932) (fig. 3.2), and culminates in his masterpiece *Ad Parnassum* (1932) with its dense opus regulatum grid compositionally ordering the surface of the canvas (fig. 4.23).[115] Klee's *Artistic Symbiosis* (1934) exemplifies how his constructive methodology informs his work by placing large blossoms into a mosaic background that suggests a room from which the flowers borrow their constructive mosaic appearance (fig. 4.22), thus, articulating rhythmically and spatially surface, size and structure.

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[114] See also *Paul Klee and his Travels* (1980) by Sadao Wada, p.51.

[115] Klee's *Ad Parnassum* is used by Hoy (2017) in her arguments for digitality or proto-digital qualities in painting connecting mosaic, painting and computer graphics, a topic explored in chapter seven.

Fig. 4.23. Klee. *Ad Parnassum* (1932)

Fig. 4.24. Prikker. *Mid-day Sun* (c. 1900)

Like Klee, Dutch artist Prikker (1868-1932) was a key figure in transmitting mosaic principles to a new generation of artists. Like Vrubel, Prikker does not feature prominently in the annals of art history. He is often associated with Symbolism and ventured in typography and textile design (fig. 4.25) but dedicated himself to mosaic work (figs. 4.26 & 4.27) and stained-glass (fig. 4.28).

According to Hoff (1958:14), Prikker's career as a mosaic maker was triggered by his experience of Pointillist painting (fig. 4.24), a technique that he expanded in scale and

'unusual lively effects' by working with actual glass tesserae (*smalti*). Prikker's approach to stained-glass, 'the sister-art of mosaic,' was also informed by this experience (ibid). *Star-Ornament* (1915), created as a memorial for soldiers killed in action during the First World War (fig. 4.26), is one of his first known mosaic works. It belongs to the collection of the *Boijmans van Beuningen Museum* in Rotterdam.

Figs.4.25 & 4.26. Prikker. *Organic-Constructive II* (1904); *Star-Ornament* (1915)

Fig. 4.27. Prikker. Mosaic *Der Tag*, Düsseldorf (1926)

In 1904, Prikker moved from the Netherlands to Germany, where he was considered primarily a ground-breaking stained-glass and mosaic designer (Boijmans van Beuningen: online). During the years 1917 and 1918, he taught the young Albers his

methods of stained-glass making, and shared his mosaical approach to design and composition, at the *Kunstgewerbeschule* in Essen. According to Fox Weber (1994:11-12), Prikker had a huge impact on Albers' oeuvre, even though Albers himself tended to play down Prikker's influence in his work.[116] 'Thorn-Prikker worked with flat expanses of bright color[sic] and stressed that real light was as important to an art work as its drawing or its painted color' (ibid:11). From Albers' early glass compositions to his series *Homage to the Square*, which he started in 1949, it is evident how powerful the mosaical legacy from Prikker was.
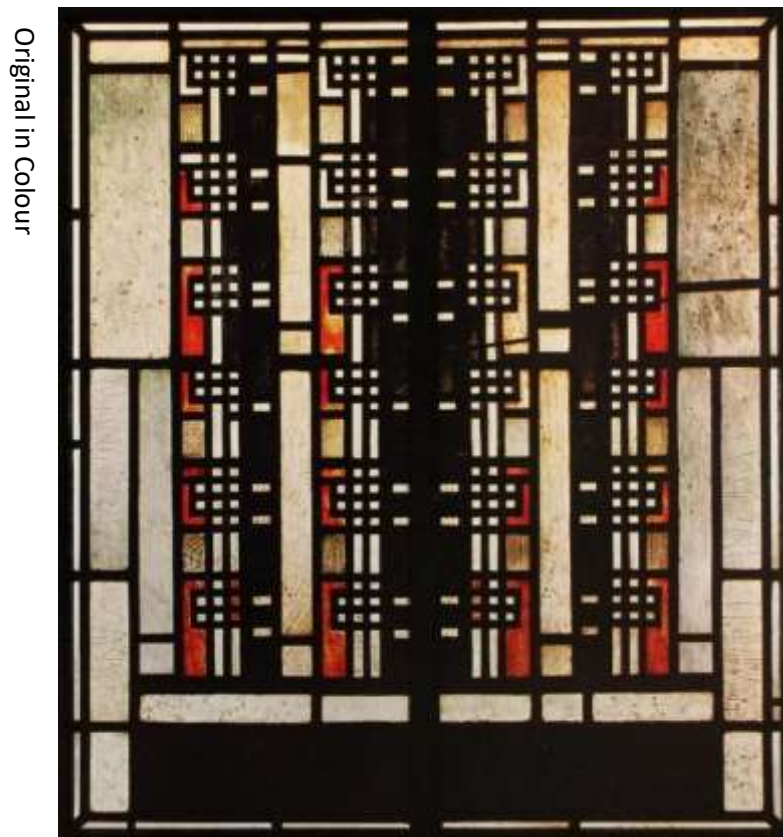
Fig. 4.28. Prikker. *Grid Lines, Orange* (1924-1925)

Albers' book *Interaction of Colour* (1956) is an indisputable example of the influence of the mosaical. Most exercises in the book are created with separate pieces of coloured paper in a Divisionist approach, such as 'The Relativity of Color'[sic], 'Gradation Studies' (fig. 4.29), 'Subtraction of Color' and 'Optical Mixture.' Colour is isolated through the cutting of every individual piece of paper, which are then combined and re-arranged in

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[116] 'Albers […] complained when art historians overemphasized his connection to Thorn-Prikker —the artist never admitted freely to influences' (Fox Weber, 1994:11-12).

a mosaical manner. The colours of the overall composition do not mix with each other in painterly style; they remain separated in blocks but interact with each other. In other words, the units of colours are modulated, put side by side meaning that there is no blurring effect on the surface of the compositions. Albers' book is essentially an exercise in composing with partible, independent units of colour. Even the exercises of 'transparency and space illusion' (fig. 4.30) rely on separate pieces of translucent paper, which are in direct correlation with separate pieces of glass.

Original in Colour
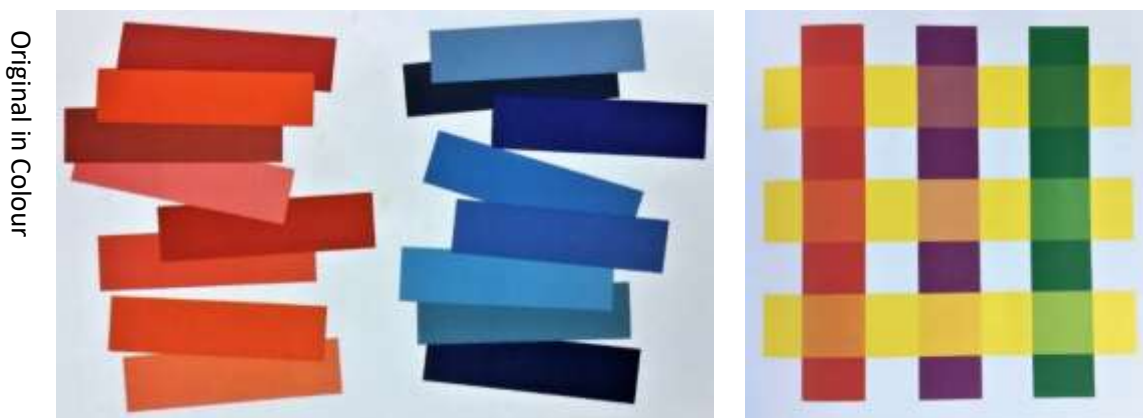
Figs. 4.29 & 4.30. Albers. *Interaction of Colour*, *Plate V-3 & Plate XI-3* (1956)

It seems that, references to stained-glass are necessarily references to mosaic principles. This understanding is reinforced by Vasari's book *On Technique* (1568), which claims that stained-glass came into existence through a direct deployment of mosaic principles in glass, forced by material constraint specific to glass production.

> At first the windows used to be made simply of clear bull's eyes [glass] with white or coloured corners, afterwards the artists thought of making a mosaic of the shapes of these glasses differently coloured and joined together after the manner of a picture (Vasari, 1960 [1568]:266).

The reason makers were compelled to use mosaic as a departure point for stained-glass windows was simply that it was technically impossible to produce large sheets of glass for the cathedral windows at the time of construction, which was generally during the middle-ages. Mosaic principles allowed makers to create vast windows with figurative images and biblical narratives. According to Vasari, the Flemish and the French led the field of mosaic stained-glass but the earliest surviving examples in situ are the stained-glass of Augsburg Cathedral in Bavaria (figs. 4.31 & 4.32).

Figs. 4.31 & 4.32. *King David & Prophet Jonas*, Augsburg (early 12th century)

The line of influence of mosaic principles in the construction of glass windows goes back to early Christian monuments passing through the Byzantine tradition and connecting to the Coptic tradition of glass windows. In the West, after Byzantium 'the next stage was a mosaic of pieces of coloured glass arranged on a certain scheme and perhaps displaying geometrical patterns' (ibid:309). It is assumed that these arrangements were called 'mosaic glass windows.' However, Vasari mentions that his sources can be confusing regarding the precise look and name of some of these ancient glass windows (ibid:310). Nonetheless, the idea of stained-glass windows deriving from a mosaic method is also present in *The Laws of Contrast of Colours* in which Chevreul (1857:223) notes that 'a work executed in small prisms of transparent coloured glass, in imitation of painting [...] would be a true transparent mosaic.'

The search for luminosity in painting and the references made to stained-glass and mosaic in the writings of Chevreul and Rood are relevant for the understanding of how the mosaical unfolds in contemporary fine art practice. In a sense, Impressionism and Post-Impressionism facilitated the use of independent compositional elements and in

doing so influenced generations of artists. For Fred Licht (in Fox Weber et al 1994:17). 'in the nineteenth and twentieth centuries, the need to explore light was a paramount concern of artists ranging from the Impressionists [...} to the Fauves...' and for Krauss (1979a:59), 'behind every twentieth-century grid there lies –like a trauma that must be repressed– a symbolist window parading in the guise of a treatise on optics.'

In her writings, Krauss offers a connection between the stained-glass window and the structural element of the grid in both painting and Minimalist sculpture. For Krauss (1979a:50), the form of the grid 'has sustained itself so relentlessly while at the same time being so impervious to change.' According to her analysis, the grid resists development because it is a methodological tool to organise the surface and its objectivity in ordering a surface causes it to be resistant to change. Modernist painting appropriated it and turned it into a visual structure that became synonymous with modernity itself. For Krauss (ibid:54, footnote), no matter the quality of the work, 'the grid is able [...] to emblematize[sic] the Modern' and allow the contradictions of science and spiritual values to remain 'within the consciousness of Modernism.' For Krauss, this ability, sometimes suppressed as 'unconsciousness,' embodied secular and religious values in a way that can be associated with Prikker, whose relation to both Albers and Mondrian is revealing.

Fig. 4.33. Albers. *Gitterbild* (1921)

Prikker composed series of stained-glass windows based on the grid, in which he dealt with spiritual values through the materiality of the work, and these are comparable to the exploration of the grid by both Albers and Mondrian. Prikker taught Albers his glass making methodology within the context of his involvement with religious art, which, for Licht (in Fox Weber et al 1994:17), fuelled 'Albers's early obsession with glass composition' that falls 'within the tradition of medieval glass windows.' The knowledge gained from Prikker allowed Albers to move from a material relationship with grids, as seen in his use of glass in *Gitterbild* (1921) (fig. 4.33), to an analytical and philosophical relationship with the grid, which is evident in his paintings in general, and more specifically his *Homage to the Square* series (fig. 4.34 & 4.35). In a sense, as a Catholic, Albers expressed both religious and secular values in these works.

Original in Colour

Fig. 4.34 & 4.35. Albers. *Homage to the Square: With Rays* (1959)
and *Soft Spoken* (1969)

Instances of the grid found in Prikker's work (fig. 4.28) are comparable to the experiments of his fellow countryman Piet Mondrian, who was four years his junior. According to Wember (1966:11), looking at Prikker's production between the late 1920s and the 1930s, the relationship with Mondrian is evident and indicates a longstanding parallel between their work. For example, in 1914, Prikker used specific areas of ratio in his mosaic cartoon for the city hall in Hagen (fig. 4.36), a strategy that appeared in Mondrian's work in the 1920s. For Wember, both artists arrived at these proportions independently through an exploration of Cubist abstraction, which led them to produce compositionally similar pieces.

Fig. 4.36. Prikker. *Hagen Mosaic Cartoon* (1914)

Wember's account is particularly interesting in its reiteration of the idea that painting embodies a higher symbolic value. For example, he considers Prikker's windows to be inferior in meaning to Mondrian's paintings, despite their shared recourse to the same area ratios, squares, rectangles, colours, and black bars. According to Wember, Prikker's works have a simple functionality, while Mondrian's paintings are absolute statements of a supreme self-sufficient order. Wember sees Mondrian as operating philosophically within the symbolic stratum of *high art*, and Prikker the glassmaker as dealing with similar compositional issues but doing so in a literal manner. However, this categorisation is problematised when it is acknowledged that Prikker worked directly with glass, carrier of a supposedly intrinsic symbolic meaning: the window acts as a conductor of light, mysticism and religious values. Johanna Luise Wex, in her doctoral thesis *Johan Thorn Prikker* (1984), discusses the abstract progression in Prikker's work comparing his approach to those of Mondrian and other members of the group *De Stijl*. For Wex (1984:66), Prikker's *abstraction drive* (*kunstwollen*) is characterised by his constant aspiration for an appropriation of visible reality through formal abstract means, which is also a driving force behind Mondrian's practice. Pertinently, Wex suggests that the approach of the *De Stijl* group was not an unexpected, isolated event. For Bois (1987:124),

> [...] a geometrical simplification of the domestic art of lead-glazing, very fashionable in Holland at the beginning of the century, shortly followed the birth of De Stijl. But beyond several experiments in this domain by Theo van Doesburg and Vilmos Huszár, the essential role was played by Johan Thorn Prikker, whose compositions, sometimes abstract, owe nothing to neoplasticism.

For Krauss (1979a), Mondrian's secular works embodied the myth maker, dealing with spirituality through a secular path in an ordered modern society. However, his work was

not without criticism; after a public display in Paris in 1931, Mondrian's paintings were described as 'strictly decorative [...] a kind of painting barely good enough to serve as bathroom tiling for its patron' (Bois, 1987:103). The interpretation of Mondrian's work as simply tiling decoration is not surprising given that his progression as a painter involved experimentation with the colour theories of the 19th century and the associated turn to mosaic principles.

Original in Colour

Fig. 4.37. Mondrian. *Dune III* (1909)

It is not surprising that Mondrian's painting moved towards abstraction, and that in this it seems to visually restage the gradual progression from finely-tessellated mosaic work to stained-glass making with its larger pieces of glass and dark interstitial bars. In her book *The Optical Unconscious* (1993), Krauss offers an interesting passage on the mosaical within Mondrian's work, which explores how it unfolded through the colour theories of the 19th century. In Krauss' words (1993:11-12),

> [i]f Mondrian began with divisionism, with that positivist notion of making the picture a mosaic of color[sic] sensations [fig. 4.37]—each dot the marker of a point of light reflected off the field of objects—so that the painting became a recreation of the surface of the world only because it was first and foremost the reconstruction of the surface of the eye, he started off from late nineteenth-century optical theory. His entry into Modernism took place on the site of the rationalization of painting around the laws of color theory and physiological optics, at the point where composition and pictorial harmony were at last to be demystified by science and to find their grounding in a set of abstract theorems—theorems that bore the names of great physiologists and physicists like Fechner, Young, Helmholtz, Hering. Simultaneous contrast, nerve tissue response-time. The two planes—that of the retinal field and that of the picture—were understood now to be isomorphic with one another, the laws of the first generating both the

logic and the harmonic of the order of the second; and both of these fields—the retinal and the pictorial—unquestionably organized[sic] as flat.

But the *Plus and Minus* paintings [fig. 4.38 & 4.39] would take the pared-down surface of the color mosaic and abstract it one step further. The color mosaic, after all, still presupposes the empirical field "out there" as its sensory stimulus; if the mosaic abstracts the world into the "pure" relationships of optics, it is nonetheless empirically founded in the naturalism of color and—no matter how finely grained its text—the point-by-point stimulation of a perceiving eye. Like Seurat at Honfleur, Mondrian would start his *Plus and Minus* from an expanse of sea and sky, two immense horizontal fields broken only by the projection of a small jetty. But he would not transcode the optical moments of this vastness into points of color. He would imagine optical law as something that is itself submitted to a code, digitalized by the higher orders of the intellect, translated into the plus and minus of a moment not of sensation but of cognition, the moment, that is, of pure relationship. His field would thus be structured by these signals—black on white—these signs for plus and minus, these fragments of an abstract grid that would intend to throw its net over the whole of the external world in order to enter it into consciousness.
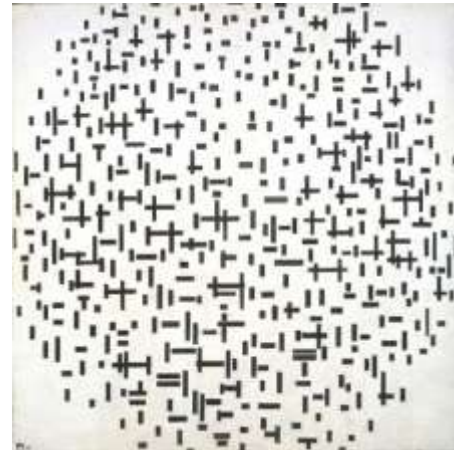
Figs. 4.38 & 4.39. Mondrian. *Pier and Ocean* (1914)
and *Composition in Black and White* (1917)

It is interesting that Krauss does not refrain from using the term mosaic to analyse Mondrian's painterly progression and the development of his pared-down visual language. From the scattered fragmentation of the *Plus and Minus* paintings, Mondrian arrived at a surface organisation 'by means of complete and regular grids' (ibid:16) (fig. 4.40). Like Malevich before him, the painted mosaic associated with Post-Impressionism serves as a departure point for the development of a unique abstract style. Krauss does not use the word mosaic metaphorically as she understands well how its principles underline the study of physiological optics, the manifestation and perception of light or the sensory quanta described by Arnheim. For Marks (2010:115), Mondrian was guided by 'a geometric *kunstwollen'* disguised as structure, making his paintings increasingly grid-like.
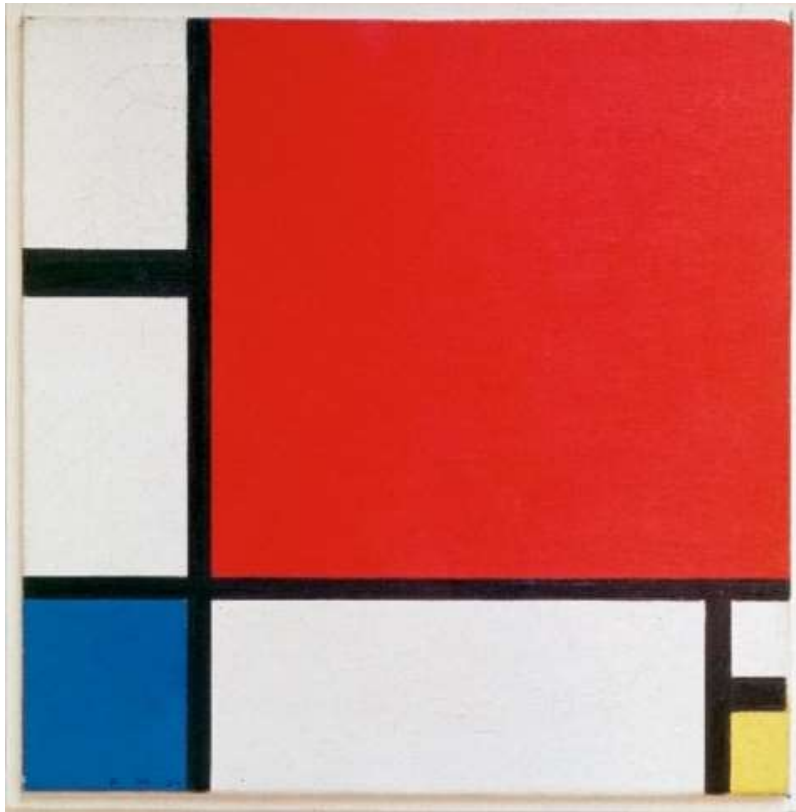
Fig. 4.40. Mondrian. *Composition II in Red, Blue, and Yellow* (1930)
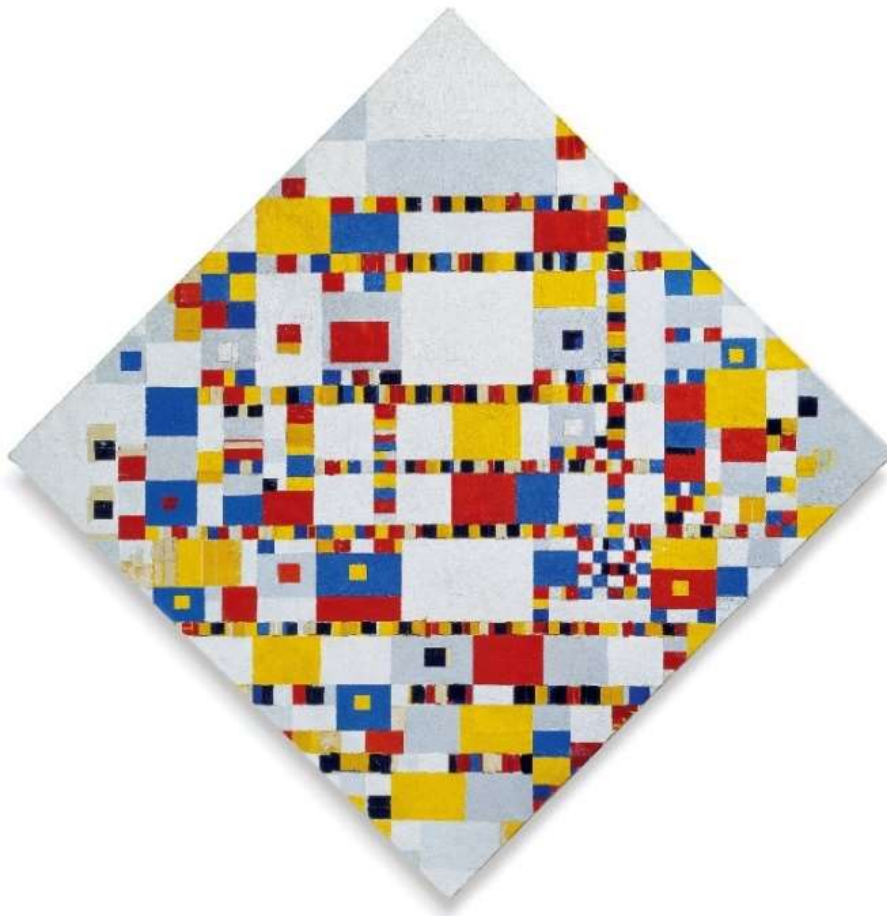
Fig. 4.41. Mondrian. *Victory Boogie Woogie* (1942-1944)

Mosaic principles unfolding in Mondrian's work becomes clearer in his last painting, the unfinished *Victory Boogie Woogie* (1942-1944) (fig. 4.41) where he divides the composition into sections of small and large squares[117] to visually convey his sensations of jazz. According to Gage (1993:238), Mondrian 'was stimulated to a new vitality by the staccato piano style of the latest phase of American jazz.' McLuhan (1964:280) suggests that, for its discontinuity, spontaneity, improvisation and required participation,

> [...] jazz belongs in that family of mosaic structures that reappeared in the Western world with the wire services [telegraph]. [...] it belongs with the many allied forms in painting and in music.

Consequently, Mondrian's exploration of the sensory experience of music through painting further evidences the significance of the infrastructural organisational principles of mosaic. Such evocation of music sensations visually is also present in the works of Klee such as *Ad Parnassum* (1932) (fig. 4.23), where the artist explores 'the structural principles of Baroque counterpoint' (Gage, 1993:238).

Elemental Units Research

Both France and Russia provided an intellectual and artistic climate for artists' experimentation with perception and sensation involving basic elements of composition.

> [The] psychological research into the effects of simple forms influenced Seurat, Signac, Wassily Kandinsky, Paul Klee, and Piet Mondrian, among others. For instance, Seurat, who was familiar with the works of Blanc and Henry, advanced a similar theory of the intrinsic psychological effects of lines of different orientation [...]. In another example, Kandinsky, in Point and Line to Plane, advocated "microscopic" analysis of three basic elements of form (point, line, and plane) claiming that there exist reliable emotional responses to simple visual configurations (Manovich, 1993:13-14).

Through the French line of influence, Impressionism and Post-Impressionism are widely understood through the theories of vision and colour and experimental psychology that emerged in the late 19th century. Colour theories that originated in studies of optics in antiquity, including Ptolemy's treatise on optics and Democritus' atomic theory and

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[117] In this unfinished work, small sections of vinyl tape used by Mondrian to mock-up the composition are still visible on the surface. They shine like mosaic tesserae and add extra luminosity to the painted canvas. They offer further evidence into Mondrian's mosaical approach.

'treatises on colour and on painting' (Gage, 1999:85), are generally understood to have been aided by observation of ancient mosaic and textiles. The Russian line of influence is based on direct contact with mosaic works in Kiev and elsewhere, and points towards a direct relationship between Vrubel's brushwork and the tessera itself. It is a connection that leads to Malevich and Tatlin, in whose hands the mosaic combines with the idea of the icon. In this case, the formal elements of composition are based on the tessera, pictorial flatness, pronounced brushwork and spatial ambiguity.

As suggested previously in this chapter, the French and Russian trajectories of experimentation with mosaic practices have influenced each other significantly, and both can be seem to stem from the Byzantine era, in terms of the Byzantine mode of representation in general, and specifically in terms of its mosaic works. However, there are some notable divergences, perhaps most apparent is the orientation of the French approach towards a more theoretical response to its Byzantine influence, while the Russian approach is more hands on and directly linked to its revival of the Byzantine tradition.

According to Manovich, there was a clear move in Soviet Russia to systematically investigate the uses and effects of basic units of composition, 'atoms of visual communication,' and their impact on art and mass communication, which involved the creation of 'psychological laboratories at various art institutions' (Manovich, 1993:9). This included the Institute of Artistic Culture INKhUK (1920-1924), the State Academy of Artistic Sciences GAKhN (1921-1930) and the State High Art-Technical Studios (VKhUTEMAS).

> [whose] goal was to create a fully rationalized[sic] visual language of mass communication where each visual element is capable of communicating a meaning, producing an emotion or causing a behavioural[sic] response (ibid:10).

For Manovich, simple abstract forms applied to visual language became attractive because 'geometric forms were neither associated with bourgeois figurative representation nor did they look like the "subjective" abstract improvisations' [...] (ibid:21). According to Gage (1999:247-251), artists such as Kandinsky were interested in a 'grammar of painting' that was connected to Russian linguistic research and they intended to identify and express the *fundamentals* of this grammar, as seen in Mikhail Matyushin's painted charts (fig. 4.42). In both Russia and France, artists were in pursuit of experiments analogous to the developing procedures of psychologists and, for Gage, this means it was fairly inevitable that they ended up in 'very similar conclusions.'

Fig. 4.42. *Matyushin's Charts* (1924), installation view Stedelijk Museum (2013)
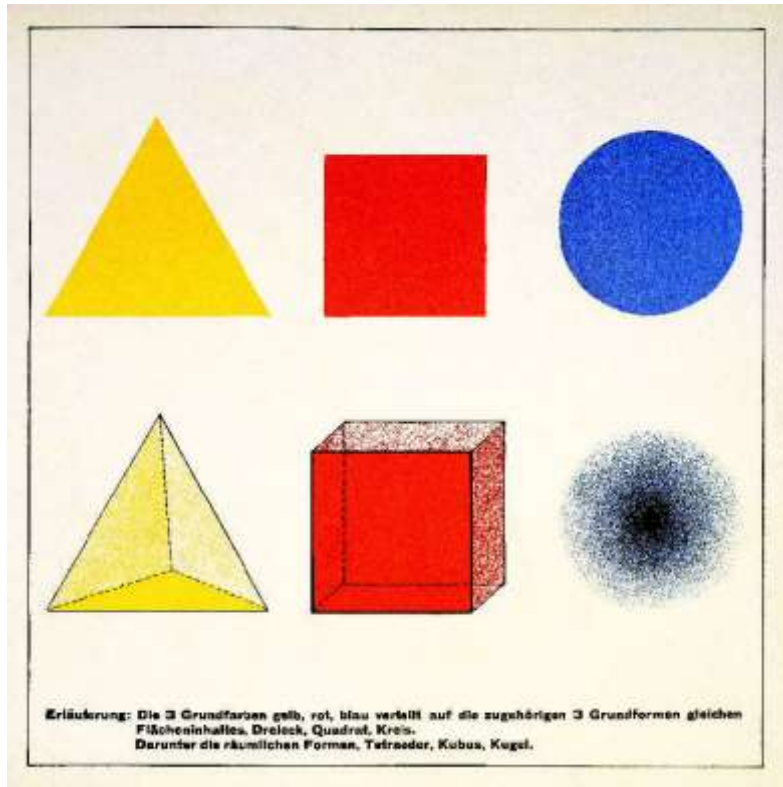
Fig. 4.43. Kandinsky. *The Three Primary Colours Spread over Three Elementary Shapes* (1923)

The research drive to identify the fundamentals of colour and compositional units was an interest that Kandinsky[118] developed at the Bauhaus through his preliminary

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[118] Note that an image of the mosaic of Empress Theodora in the basilica of San Vitale in Ravenna is used by Kandinsky as the first illustration of his book *Concerning the Spiritual in Art* (1912). According to

programme (fig. 4.43). According to Bergdoll & Dickerman (2009:18), this process of defining 'the primary elements of visual form' at the Bauhaus was initiated by Johannes Itten, who approached the task by attempting to disassociate these basic units from the limitations of 'cultural convention.' Both Kandinsky and Klee delivered classes on basic units of composition, which became 'the building blocks for larger systems in the products of the workshops.' This allowed both workshop masters and students 'to create a broad range of works using recombinable modular elements.' For Bergdoll & Dickerman (2009:18-19), 'the visual idioms that emerged' embraced the structuring framework of the grid, which gave an 'overarching shape to the products of the Bauhaus'. For them (ibid:21),

> [...] the grid became a structural tool allowing for the creation of spaces that integrated disparate mediums into overarching designs - painting, furniture, and textile into architecture.

Therefore, the ideas developed by the Russian 'laboratories for experimental aesthetics and art theory' combined with the premises of *elementarisation* and *integration* of *De Stijl* group[119] in the Netherlands were absorbed by the Bauhaus (ibid:20-21). At the Bauhaus this was further developed into an educational system that repackaged the tesserae for modernity, disseminating a mosaical approach to making based on additive elemental units of composition in combination with the structuring element of the grid. The spread of such an approach was aided by the dispersion of the members of the Bauhaus, which took it beyond the borders of Europe.

According to Monier (Gabet et al 2018:227-235), the Bauhaus diaspora 'considerably broadened its influence' beyond the borders of Europe.

> Each Bauhäusler, in passing on his or her knowledge to students or collaborators, succeeded in broadening the sphere of Bauhaus influence. Bauhaus teaching methods, so revolutionary when the school was founded, now form the basis of all teaching and continue to shape new generations of artists and designers (ibid:231).

For instance, in 1933, Josef Albers found work at the Black Mountain College in North Carolina where he taught a programme based on the Bauhaus preliminary course, and

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Taroutina (2013:134), Kandinsky was familiar with Byzantine scholarship and was 'primarily interested in the seeming universality of medieval artistic production'.

[119] According to Yves-Alain Bois (cited in Bergdoll & Dickerman, 2009:20-21), that means the distillation of fundamental forms that are combined to create a new encompassing whole. For Eskilson (2018:48), 'De Stijl was focussed on elemental geometric forms as they are perceived in two, three, or, somewhat mystically, even four dimensions.'

through that influenced a whole generation of artists in the United States. In 1950, Albers began to teach at Yale University, where he produced his influential book *Interaction of Colour* (1956), further broadening his area of influence, and the spread of these ideas.

In sum, the argument presented in this chapter is that Post-Impressionist practice was the result of artists' speculative use of basic compositional elements inspired by the sensation of simple form of experimental psychology, combined with the colour theories of the 19th century. Painting adopted an additive method of composition very much based on mosaic principles, taking a more theoretical approach in France and through a direct engagement with mosaic in Russia. Vrubel's knowledge of mosaic and his exploration of the painted tessera greatly influenced Malevich's Suprematism and the development of Constructivism in art. Consequently, the unifying principles of composition and experiments with colour at the Bauhaus developed in parallel with the approach of *De Stijl* movement and Mondrian's explorations of the gridded surface, which similarly propagated a mosaical approach to making. As discussed in this chapter, behind these Modernist experiments there is a methodology which is much older than its Modernist manifestation; the use of basic units of composition reached a pinnacle with the Byzantine tessera itself, and the Modernist experiments with basic units of composition simply repackaged this for use in painting, the idiom favoured by Modernist practitioners. It is important to note that, this was not limited to painting; new parameters were also developed for architecture and design. However, the strongest manifestation of additive abstract content in this period was in painting.

At present, when painting, sculpture or installation practices use constructive ideas as a source of inspiration and approach, they are, in fact, referencing mosaic art in its epistemic complexity. In this way, the continuity of the mosaical here is fluid and understood through the unfolding and enfolding of events, theories and practices, science and art. No matter how dismissive the current art climate is regarding mosaic art, as the evidence suggests, mosaic principles are at the inception of Modernism and offered an expressive potential that allowed artists to go beyond the naturalism and realism derived from the Renaissance mode of representation. Mosaic principles offered a new approach for artists confronted with the fast-paced modernisation of society, homologous to the Electronic era. What is left to unfold is the mosaical within sculpture, which is discussed in chapter five and six, and the domain shift of mosaic as data visualisation in digital technologies, which is explored in chapter seven.

Chapter Five: Towards Three-dimensionality

Focussing on painting, the previous chapter examined how the influence of mosaic on the study of optics contributed to the enfoldment of the tessera in the work of Post-Impressionist painters in France and how mosaic informed a path to abstraction in Russia through direct contact with, and knowledge of, mosaic work. The previous chapter showed how this enfoldment of mosaic culminated in the development of a constructive methodology based on elemental units of composition. The current chapter begins with a consideration of aspects of the phenomenology of mosaic and relates this to the *sculptural debate* and the *embodied* experience of viewing. This chapter then traces in more detail how the Russian avant-garde explored mosaic principles and iconicity through experiments with *faktura* and in doing so initiated a new approach to making. This account focusses on Tatlin's material heterogeneity and Rodchenko's homogeneity and the concept of modularity. Extending the discussion on material modulation, the final section of chapter five connects Tatlin's heterogeneity to assemblage work, which acquired its own categorical value in the 1960s.

The Phenomenology of Mosaic

When it comes to mosaic work and its relationship with sculpture and installation art, there are two important points regarding the phenomenology of mosaic that need consideration: the materiality of mosaic and its production of images through additive mixture and composition, that is, the constructive nature of a mosaic as an assemblage of a myriad of separate units which draws attention to the role of the eye; and, the way in which mosaic articulates architecture, providing the viewer with an embodied experience of space.

The mosaical, in the most complete understanding, is the ability of a mosaic to articulate images through separate discrete units. In other words, in the mosaical, the pictorial and the constructive lines (the symbolic and the material strata) merge to form a single work. Mosaic as material operates in a constructive sense as well as in a pictorial sense,[120] despite some scholars, such as Dunbabin (1999:330), regarding mosaic as a medium not suited to picturing. For Ling (1998:6), there is some logic to juxtaposing thousands of bits to exploit 'specific properties of the medium,' but to mimic

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[120] Discussed in part one, chapters two and three.

the effects of painting is at best absurd. However, the long history of pictorial mosaic attests to the opposite. The suitability of mosaic to picturing can be questioned, but it should be born in mind that mosaic has provided digital technologies with a viable method of creating images and an architectural structure for virtual environments through the amelioration of image resolution, as discussed in chapter three. This fact draws attention to the other important point regarding the phenomenology of mosaic that needs consideration; that is, the way in which mosaic articulates the architecture that hosts it without creating a separate illusionistic space. As Hills points out (1987:29) 'no threshold or front plane of pictorial space is defined,' instead mosaic respects the shape of the host form. Furthermore, it articulates empty space within the *representational logic* of the artwork. According to Taroutina (2013:203) based on Otto Demus' theory of the spatial icon from 1947,

> [...] the Byzantine image projected itself into real space, collapsing the separation between the purely pictorial realm of the artwork and the lived environment of the viewer.

In this way, the pictorial tradition of mosaic art articulates architecture in a way that offers viewers access to multiple viewpoints and a phenomenological engagement with the work itself. In comparison, the pictorial tradition of painted single-point perspective born in the Renaissance, and thoroughly explored by easel painting, resisted such phenomenological engagement and reinforced the primacy of the private, the lineal and the Cartesian,[121] as discussed in the *Gutenberg Galaxy* (1962). In addition, architectural mosaic works usually combine floral and geometric patterns within their composition, and often incorporate writings, thus creating an immersive experience that demands an active engagement on the part of the viewer. Thus, the traditional mosaic work can be characterised as allowing for an all-encompassing encounter, giving equal weight to various viewpoints. This characteristic can be understood as *rhizomatic,* and is also found in historically recent installation art:

> [...] the space, and the ensemble of elements within it, [...] regarded in their entirety as a singular entity [...] that addresses the viewer directly as a literal presence in the space (Bishop, 2005:6).

The viewer's immersion within a mosaic work in an architectural setting is a characteristic of mosaics that have existed since antiquity, it belongs to floor mosaics as well as walls and vaults. The Nile mosaic is a special example of this kind of

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[121] Modern in historical terms, not modern as in 'modernist painting' and flatness.

immersion (fig. 5.1), as well as the apses of the Basilica of Santa Maria Maggiore in Rome and the mosaics in the Basilica of San Vitale in Ravenna. The Nile Mosaic is

> [...] an extraordinary example [that] survives from an apsidal room opening onto the forum at Praeneste (Palestrina) [...], probably dating to the end of the second century BCE [...], [it] is a large visual map of Egypt, perhaps inspired by an Alexandrian work. The Nile dominates. In the foreground is Alexandria, with its monumental buildings, lush vegetation, and cosmopolitan lifestyle. A vignette at the lower right may show a Roman general's visit to Egypt. The mosaicist depicted different perspectives to accommodate a viewer's movement across the floor, and suggested recession by placing distant scenes at the top of the mosaic: the river winds away into the distance towards Ethiopia where hunters pursue wild animals – such as crocodiles and hippopotami – labelled with Greek names. Colour also become less vibrant in the faraway scenes, a device known as atmospheric perspective. Remarkable for its fine execution and the richness of its colours. (Davies et al, 2011:194-195).

Original in Colour

Fig. 5.1. *The Nile Mosaic* (2nd century BC)

Mosaic's ability to provide the viewer with changing perspectives and multiple viewpoints has enabled its principles to be marshalled as a literary method proposing a non-visual structure, as evident in McLuhan's media studies of the 1960s, which put forward a mosaic method of cultural analysis that has recently found resonance with a new generation of writers. Consequently, an architectural mosaic work, with its multiple access points, allows the discussion to take into consideration the second phenomenological concern; the relationship between the body of the viewer and the work itself, which resonates with the discourse introduced to sculpture by Krauss in

Passages in Modern Sculpture (1977). This was influenced by the phenomenology of Merleau-Ponty, whose analysis, according to Potts (2000:208), placed 'vision as a part of the self's interaction with the world as a mode of being' rather than severed from that interaction and operating as a mapping instrument of control or categorisation. For Potts (ibid), Merleau-Ponty understood viewing, not as the self-contained activity of a disembodied eye, but as embedded within the body and inextricably bound up with a broader situating of the body within the physical environment. Bishop (2005:50) describes this as an embodied perception that is not simply 'a question of vision, but involves the whole body.' As such, Merleau-Ponty's ideas are closely aligned with a rethinking of the sculptural object as an intervention in the spatial arena shared with the viewer rather than an isolated, self-contained shape.

The phenomenological condition of mosaic is generally little debated in connection with contemporary installational practices. This is compounded by the fact that most contemporary mosaic artists are not concerned with the phenomenological relationship offered by the mosaical, in other words, its ability to envelop and immerse the viewer, which is fundamental to recent installation art. The current mosaic debate is very much based on the object itself.[122] Mosaic artists have adopted an approach like that of easel painting and generally produce portable works. When it comes to mosaic sculptures, the contemporary discourse also lags by not addressing the phenomenological turn in recent sculptural practice. The exhibition *Montezuma Fontana Mirko* (2017-2018), a mosaic sculpture survey curated by Alfonso Panzetta for the *Museo d'Arte della Città di Ravenna*, evidences the weight of thinking that regards mosaic simply as isolated object.

The discussion of the dual phenomenology of mosaic works, its image making and spatial articulation, is part of the contribution that this thesis makes to knowledge. In this sense, the thesis expands on the tradition of fine art mosaic itself, as centred in Ravenna, Italy, and connects it to the more recent tradition of installation art and other spatial practices concerned with site-specificity, site-responsiveness, as well as more recent accounts of transience and ephemerality. Furthermore, the relation between mosaic and spatial concerns connects this thesis to another interesting point, the communal experience provided by installation art, more specifically works that address particular parameters of a given room or building, provide the embodied viewer with a

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[122] My installation work within the mosaic art circuit is an exception, as well as some works by Lysiane Bourdon, Silvia Naddeo and a few others.

space of sociability,[123] which has parallels in pre-modern art experienced through monumental buildings such as basilicas, cathedrals and other public buildings. This then is a form of art that provides the viewer with a more organic and open experience of space, an immersion in non-cartesian and audile-tactile traditions, as suggested by McLuhan. In the article 'Installation and Sculpture' (2001), Potts concludes that installation art is deeply rooted in Christian tradition and church displays, and is not simply an isolated contemporary occurrence. For Potts, the museum replaced the church and the palace as a place of sociability, an idea that connects installation to McLuhan's discussion of the return of pre-modern ways of sensing and interacting, replacing the private and lineal mode inaugurated by the invention of the printing press. In this way, installation art is a feature of the Electronic era and the emergence of site-specific works in the 1960s and 1970s suggests a clear break with the modern tradition characterised by the privacy of works of art, mostly paintings, based on single-point perspective, that emphasised the visual over the audile-tactile, the lineal, the scientific and the Cartesian. For McLuhan, pre-modern structures return with electronic culture and Postmodernity, characterised by organic, non-lineal, re-collectivised and retribalized experiences in phenomenological space.[124] The phenomenology of viewing and displaying sculpture is an issue articulated in this and the following chapters, both historically through the re-evaluation of artworks and related literature, and the experiential, provided by my own art practice.

Faktura

In chapter four, the influence of mosaic principles in painting were explained along the lines of avant-gardist experiments influenced by studies of optics in France and a direct contact with mosaic making in Russia through the Russo-Byzantine revivalism; the tessera repackaged for modernity. As discussed, there was exchange of information and influence between the French artists and the Russians, as well as other centres in

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[123] Sociability here means simply a place that can provide a meeting point for viewers in their appreciation of art, such as chance meetings and interactions that might come to the fore as the viewers move around the space. It is not equivalent to Bourriaud's Relational Aesthetics that 'take as their theoretical horizon the realm of human interactions and its social context, rather than the assertion of an independent and private symbolic space' (Bishop, 2005:116).

[124] This view is shared by Hal Foster ('The Crux of Minimalism', 1986), where he associates Minimalism and 'the phenomenological turn' with Postmodernity.

Europe at the turn of the 20th century. Clearly the turn to mosaic at this time did not occur in isolation and in a simplistic manner; its unfolding is complex and rhizomatic.

Through the Russian avant-gardes, influenced by the Russo-Byzantine revivalism of the 19th century and the paintings of Vrubel, two key figures emerged: Tatlin and Rodchenko lead Russian artists in the exploration of the three-dimensional cues of mosaic making and icon-painting. Through their practice mosaic principles unfold in sculptural terms, paying particular attention to the materiality of the surface, or *faktura*, and its three-dimensional unfolding as modularity.

> Vladimir Tatlin prized and avidly collected Vrubel's art and Aleksandr Rodchenko asserted that in the early nineteen teens he "painted like Vrubel" [...] [Their] interest in Vrubel to the "constructiveness" of the latter's paintings (Taroutina, 2013:105-106).

Faktura entered the Russian aesthetic discourse in 1912 through the works of David Burliuk and Vladmir Markov (Voldemars Matvejs) as a concern of Futurism. According to Gassner (1992:309), it 'denoted the visible and palpable result of the physical treatment of material.' For Burliuk (cited in Gough, 1999:36), faktura is 'the materiality of the surface.' For Gassner (1992:309-310), faktura became a 'critical element in the progress of art and the professionalization[sic] of the artist' within the context of the Russian Revolution. By 1919, faktura as a 'distinguishing feature of objects of art' had become an independent formal element providing artworks with their autonomy and self-referentiality. For Gough (1999:33-34), the meaning of faktura changed from a 'matter of materiality' to a 'matter of artistic subjectivity' and its eventual obliteration.

The Constructive Process of Vladimir Tatlin

In a chapter dedicated to Tatlin, Taroutina (2013:167-206) is emphatic in associating his practice with mosaic art and icon-painting. According to Taroutina, from 1913 onwards, through the exploration of *faktura* and eventual move towards three-dimensionality, Tatlin 'rejected the visual in favour of the haptic and experiential,' which Taroutina suggests was a consequence of his formative years in Kiev and Penza. In Kiev, Tatlin was exposed to mosaic works and frescoes in several locations and, as a sailor, he visited several countries where he would have appreciated 'a rich variety of different Byzantine monuments.' In Penza, Tatlin studied with Aleksei Afanasiev, an artist, restorer and 'expert on medieval monumental art' whose teaching methods

included assignments exclusively based on mosaic making. According to Taroutina (ibid:171-172), Afanasiev compelled his students to gain a comprehensive understanding of Byzantine mosaics and frescoes through careful observation and copying of works from 'Byzantium, Ravenna and medieval Rus[sia] either from life or based on high quality reproductions.' Tatlin stated that Afanasiev's teachings had a lasting influence on his work and shaped his practice 'well into his mature years.' For Taroutina (ibid:181-182),

> Tatlin's early paintings manifest a sophisticated grasp of the underlying geometries, rhythms, proportions and central principles of iconic imagery. They likewise reveal his interest in the way in which the material employed in icon-painting and monumental art were crucial in dictating their final form just as Mikhail Vrubel's experiences in the church of St. Cyril facilitated his evolution towards a distinct Modernist style [...].

Tatlin's experimentation with *faktura* and the materiality of his work are thought to be derived from the *constructive logic* of a religious icon with its encrusted surface and precious stones (figs. 5.2 & 5.3) and its use of colour as an attribute of the material; colour here is 'a reality and an element' (Punin 1921, cited in Taroutina, 2013:192). Furthermore, the phenomenological relationship between the viewer and monumental frescoes and mosaics allowed Tatlin to reconceptualise space in relation to artwork in a broader sense (Taroutina, 2013:169). In addition, taking into consideration Tatlin's familiarity with mosaic making, it is possible to infer that his handling of faktura is also influenced by the interstitial and tactile qualities of mosaic work.

Original in Colour

Figs. 5.2 & 5.3. *Byzantine Icon* (10th - 11th c.) and *Icon of St. Theodore* (early 14th c.)

> For Matvejs, faktura is equally manifest [...] in sculpture and architecture, and indeed in all media wherein the material or materials used [...] produce a perceptible "noise" (Gough, 1999:39).

For Gassner (1992:298), Tatlin was a 'solo runner' within Soviet artistic clusters. Taroutina (2013:174-182) distances him from the influences of Picasso's Cubist period, as well as Matisse, and provides a compelling argument for a local source of inspiration and influence in Tatlin's work, such as his self-portrait as a sailor (1911-1912) (fig. 5.4) and his nudes 1 and 2 (1913), which are commonly associated with Cubism.

> Tatlin's paintings from 1911-1913 had more affinities with the pictorial conventions of iconic images rather than with the works of Picasso and Matisse. They were as far removed from the monochromatic grid of Analytical Cubism, as they were from Matisse's expansive, decorative fields of saturated color[sic] (ibid:181).

Original in Colour

Fig. 5.4. Tatlin. *Self Portrait as a Sailor* (1911-1912)

In her discussion of the *Corner Counter-Reliefs* (1914-1915) (fig. 5.5), Taroutina stresses that Tatlin's move towards 'real space' was informed by his studies of medieval mosaics in Penza and his development of an instinctive notion of the 'spatial mechanisms of Russo-Byzantine monumental art' (ibid:204).

According to Punin, on both theoretical and formal levels, Tatlin's reliefs radically departed from the precedent set by Picasso (Taroutina, 2013:191 & Murray, 2017:218-219). Punin argues that the latter exemplified the final stage of the Western European

tradition of painting, which stressed individualism, aestheticism and subjectivity, while Tatlin's works replaced these qualities with material, objective and *realist* concerns that were directly inherited from the iconic tradition. For Punin, 'the influence of Russian icons on Tatlin is undoubtedly greater than the influence of Cézanne or Picasso upon him' (Punin 1923 cited in Murray, 2017:218). As such, according to Taroutina (2013:191), Punin concluded that Picasso's Cubist works marked the end of an artistic era that had begun with the Italian Renaissance, while Tatlin's reliefs signalled the dawn of a new era in art. For Herbert Read (1987 [1964]:90),

> Picasso's reliefs remained painterly [...] extensions in depth of the two-dimensional picture plane [...] but Tatlin did conceive [...] a new kind of sculpture. [...] materials and ready-made objects [...] arrange[d] [...] in 'real' space without any representational intention.

Original in Colour

Fig. 5.5. Tatlin. *Corner Counter-Relief* (1914)

Moreover, Taroutina indicates that ideas of *iconic spatiality* were already in vogue in Russia in the 1910s, citing a theoretical work by Tarabukin[125] that discusses the phenomenological relationship between the viewer and a monumental mosaic.

> Instead of "absorbing" the viewer into its pictorial space, the iconic depiction projects itself outward from the surface of the image into the space of the viewer: The icon-painter thinks in a non-Euclidean way [...] He rejects linear perspective as a way of articulating infinite space. The world of icon-painting is finite [...]

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[125] *Philosophy of the Icon,* a book manuscript written by Tarabukin in 1916 and published in 1999.

inverting itself in so called "reverse perspective," it terminates somewhere outside of the border of the icon in front of the viewer (Tarabukin 1999 [1916], cited in Taroutina, 2013:204).

For Taroutina (2013:202), in breaking away from easel painting and the use of high art materials, Tatlin's *Corner Counter-Reliefs* explored contrasting surfaces through a selection of found detritus. In this, the works reveal a concern with the unique properties of materials within 'multi-directional agglomerations of components that collapse the boundaries between negative and positive space.' Thus, these pieces evidence the logic of the icon, the *reverse perspective* discussed by Tarabukin and the *material heterogeneity* discussed by Gough. Referring to Matvejs, Gough (1999:42-45) argues that Tatlin's *materiological determination*[126] reformulated faktura as the working of the material itself and not just the mere surface of a painting thereby expanding faktura to include empty space and redefining it as a sculptural element. For Taroutina (2013:205);

> With their corner placement and dynamic projection into real space, the Corner Counter-Reliefs decisively reconfigured the relationship between the viewer and the artwork, activating a new kind of bodily engagement with a perceptual experience of art. More than just a catalyst for materialist investigation, the iconic image functioned as a conceptual paradigm for Tatlin, allowing him to rethink the role of the new art object not just formally, but also functionally.

In sum, the progression logic of Tatlin's practice, according to Taroutina (2013:187), shows an incremental reduction of the image to its most basic geometrical structure, the elimination of illusionistic references and the preservation of the natural properties and autonomy of materials. This is at the core of what Gough (1999:52) describes as the *materiological determination* and *material heterogeneity* of Tatlin's work. As this suggests, Tatlin developed an acute awareness of spatial articulation, which revealed 'a new analytical and systematic approach' to making, which characterised the *constructive process* that announced his indexical mode of production (Taroutina, 2013:198 & Gough, 1999:52). This line of thought, connecting Tatlin's approach to mosaic making and the logic of the icon, makes a significant contribution to the understanding of the climate in the 1910s regarding the passage from pictorial illusion to flatness, texture and three-dimensionality. The concept of faktura is also key in this regard as it aids the understanding of the mosaical within sculpture and spatial practices.

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[126] Material determining the form (Gough, 1999:52).

The Modularity of Aleksandr Rodchenko

As mentioned previously, Vrubel was a major influence on Rodchenko's practice. According to Gough (1999:53), Rodchenko's exploration of faktura and his *material homogeneity* readdressed Tatlin's progression from surface to material. Rodchenko's *Black on Black* paintings (1919) restaged the relationship of faktura and surface by manipulating the constancy and variations of black as pigment revealing a diversity of surface effects such as matte, gloss or luminous. However, he isolated them from what he described as any semantic function. Gough sees this as a direct response to Malevich and Kandinsky's spiritual connotations and colours. According to Gassner (1992:310);

> The increasing concern with faktura as a design element in Russian avant-garde painting since 1912 assumed a completely new quality after Rodchenko's black paintings had demonstrated the practical and aesthetic consequences of the faktura concept: The picture lost its symbolic character; it became an object.

For Gassner (1992:306-310), artistic concerns with faktura were driven by the need to justify art practice within the context of the October Revolution (1917), when artists in the traditional sense were positioned as obsolete. Rodchenko and the Constructivists were necessarily utopian and rejected aesthetic concerns, favouring instead formal artistic speculation focusing on 'technology and experimental thinking.' Following this trajectory, a concern with faktura allowed artworks to become autonomous objects and artists to become producers of things in the same sense as *the proletariat*. Gassner argues that *artistic instinct* was abolished and a *professional approach* gained momentum in its place. Within this climate, the material heterogeneity of faktura inaugurated by Tatlin was relinquished in favour of material homogeneity, which drove the Constructivists' pursuit of *materiological determination*. According to Gough (1999:53), this process allowed Rodchenko to develop 'a new indexical principle of modularity' in an attempt to eradicate the subjectivity found in Tatlin's work.

According to Gassner (1992:311), modularity developed as conceptual framing of the three-dimensional as a consequence of Rodchenko's series of experiments with the mechanisation of mark making and the application of paint to canvas. In this, Rodchenko banished surface attraction from painting and began to develop a 'theory of deductive structure,' which allowed him to venture into three-dimensional work. Gough (1999:55) suggests that Rodchenko's *Second Series of Spatial Constructions* (1920-1921) exemplified this moving of 'faktura off the surface and into space.' Potts

(2000:110) takes up this reading, describing this *Second Series* as 'a laboratory experiment in the possibility of light reflective surfaces; which, as *Oval Hanging Construction n.12* (c. 1920) (fig. 5.6) shows, clearly follows the logic of the Byzantine icon.

> It is set in space in such a way that one comes close and looks up at it, it momentarily appears to float free of the confining walls and floors of the interior environment where it is placed (ibid).

Original in Colour

Fig. 5.6. Rodchenko. *Oval Hanging Construction n.12* (c. 1920)
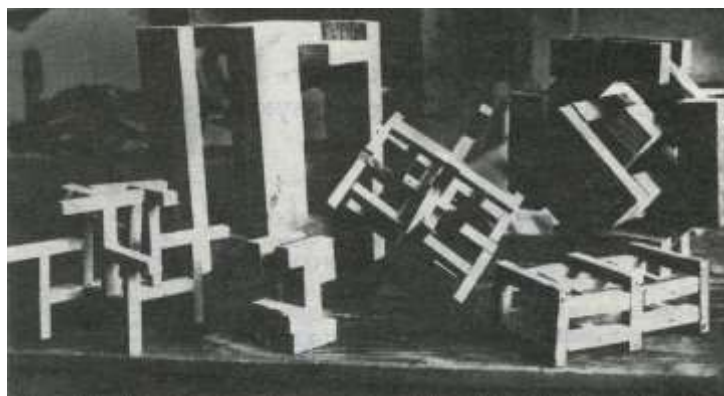
Fig. 5.7. Rodchenko. *Spatial Constructions, 3rd series* (1920-1921)

Alongside working on his *Second Series*, Rodchenko explored sculptural modulation through his combinatory wood constructions of 1920-1921 (*Third Series of Spatial*

Constructions). These were based on the repetition of a *single form*, assembled three-dimensionally by a symmetrical positioning around a centre (fig. 5.7).

> I experimentally developed these most recent constructions to bind the constructor to the law of functionality of forms and their relationships and to demonstrate the universal principle that all sorts of constructions of different systems, types, and applications can be built from identical shapes. (Rodchenko c. 1921, cited in Gassner, 1992:313).

Rodchenko's experimentations introduced modularity into sculpture. The tessera element that enfolded in Vrubel's paintings unfolded as structuring homogeneous materials and uniform elements in Rodchenko, elements that could be consistently combined in various arrangements within the system.[127] However, within the climate of the artist searching for a position in the new reality of the Soviet State, the Constructivists eventually dropped aesthetic purposes in favour of a production system within which 'a systematically constructed structure fulfils a practical purpose' (Gassner, 1992:316).[128] In other words, the independence of art, characterised by the experiments with faktura, was short lived and 'intuition [was] replaced by precise methods of construction and experientially planned invention' (ibid:307). For Gassner (1992:305), these constructive principles eventually flourish with Concretism and Minimalism and the 'conception of artistic creation as a thing introduced a new paradigm, which has claimed validity to the present day'.

According to Briony Fer (1989:27), the Constructivists defined their principles in relation to a 'scientific system' and applied it to art. In doing so, they reconfigured the dual nature of mosaic as a source of influence. They applied structural (constructive) principles additively to the realm of the pictorial, and eventually, to fully explore them, they realised that these principles had necessarily to occur in space. In Rodchenko's case, this came to the fore in relation to issues with the figure-ground articulation on the canvas. Faced with these issues, according to Gough (1999:55), he found that faktura no longer functioned in the realm of abstract paintings and had to be drawn into a spatial articulation instead.

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[127] This was not achieved alone, and it is understood within the context of the constructivists and their discussions and experiments at the INKhUK Institute. Contemporaneously with Rodchenko, Karl Ioganson produced a series sculptures based on the principles of modularity. See: Gough, M. (2005) *The Artist as Producer*. University of California Press.

[128] This relates to another branch of Constructivism known as Productivism. A detailed discussion of the specificities of both falls beyond the scope of this thesis, as it does not add any further insights regarding the mosaical.

The key to understanding the contribution that experiments with faktura made, in terms of unpacking the mosaical within contemporary fine art practice, lies in Tatlin and Rodchenko's articulation of *materiological determination*. Mosaic principles flow through Tatlin's material heterogeneity and spatial articulation, which, as already noted, was based on the reverse logic of spatial mosaic icons. For Gough (1999:47), this is an 'un-modernist [...] display of hybridity.' This interpretation is also developed by Krauss who, in *Passages in Modern Sculpture* (1977:53-56), predicts its unfolding as installation art and spatial practices engaged in tackling the phenomenological relationship with the viewer. Tatlin's heterogeneity can also be felt in the sculptures of High Modernism, such as those of David Smith and Anthony Caro (fig. 6.3).[129] Rodchenko's contributions[130] are closer related to a traditional view of mosaic and their sense of material homogeneity, regularity, seriality and repetition of form through the concept of modularity resonates through the works of Donald Judd and other Minimalist artists such as Carl Andre and Richard Serra. Interestingly, according to Gassner (1992:309), Rodchenko also rejected the division between *high* and *low* art, advocating a non-chronological study and juxtaposition of works based on faktura.

The historiography of art promotes the French line of influence as the strongest and places the Russian contribution as a side effect of the art being produced in Paris. For example, as Torcellini (2017:51) points out, Clement Greenberg asserts that the Constructivists begun their project after Picasso, and Krauss (1977:53) confirms that Tatlin imitated Picasso's constructions. However, Taroutina's thesis offers an alternative narrative in this respect, and, as seen in chapter four of this thesis, both the French and the Russian lines of influence have roots in mosaic principles and as such emerge from a context within which 'fragmentation is erected as a mindset' (Torcellini, 2017:41). Such accounts provide this thesis with enough evidence to deduce that mosaic principles unfolded in 20th century art through notions of collage and assemblage, which then influenced facets of Modernism, as revealed in various sculptural spatial articulations and Minimalism's characteristic seriality. In fact, it is possible to argue that, through Tatlin's practice and Constructivism, the Russian avant-garde centralised a practical understanding of mosaic making, and thereby introduced reconfigured mosaic principles to the art of the early 20th century, which subsequently informed practices such as assemblage, spatial drawing, Minimalism and other art

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[129] The collage nature of High Modernist sculpture is mentioned in chapter six. However, it is a topic not fully developed within this thesis.
[130] As well as Karl Ioganson's.

movements such as Concretism and Neo-Concretism. Of course, this should not be understood in isolation, as constructive principles of modulation were crosspollinated in Europe in the early 1920s. According to Borchardt-Hume (2006:81), 'the confluence of ideas [...] linked together Dada and Constructivist groups' with the Bauhaus and *De Stijl* movement, as this photograph taken at the Congress of the Constructivists and Dadaists in Weimar in 1922 illustrates (fig. 5.8). In this image László Moholy-Nagy, El Lissitzky, Theo van Doesburg and Jean Arp can be seen among other artists.[131]

Fig. 5.8. Congress of the Constructivists and Dadaists, Weimar (1922)

Assemblage as a Category

Assemblage as a formal category of art was consolidated in 1961 at the Museum of Modern Art in New York. The exhibition *The Art of Assemblage* curated by William Seitz offered an overview of a range of artworks under the label of assemblage. According to Julia Kelly in her article 'The Anthropology of Assemblage' (2008), this created an 'excitingly expansive and frustratingly vague' notion of an artwork (Kelly, 2008:24). This survey exhibition presented collages and assemblages by many artists ranging from the 1910s to the 1960s, including *Still Life* (1914), an assemblage of painted wood and

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[131] From top to bottom and from left to right: 1st row: Lucia Moholy, Alfréd Kemény, László Moholy-Nagy. 2nd row: Lotte Burchartz, El Lissitzky (with a pipe and a cap), Cornelis van Eesteren, Bernhard Sturtzkopf. 3rd row: Max Burchartz (with a child on his shoulders), Harry Scheibe, Theo van Doesburg (with a paper hat), Hans Vogel, Peter Röhl. 4th row: Alexa Röhl (in black), Nelly van Doesburg, Tristan Tzara, Nini Smit, Hans [Jean] Arp. 5th row: Werner Graeff and Hans Richter (on the ground).

upholstery fringe by Picasso (fig. 5.9), a replica of *Bicycle Wheel* (1913) by Duchamp (third version, 1951, fig. 5.10), *Collage with Squares Arranged According to the Law of Chance* (1916-1917) by Jean Arp (fig. 5.11) and *Little Hands* (1960) by Arman (fig. 5.12). Drawing on earlier notions of *non-art* and *anti-art,* particularly in their combination of found materials and everyday objects, these works rejected high-art materials. Furthermore, according to Torcellini (2017:51), they 'embodied both a poetic of the fragment and of the object, surpassing the boundaries of traditional art practices.'

Original in Colour
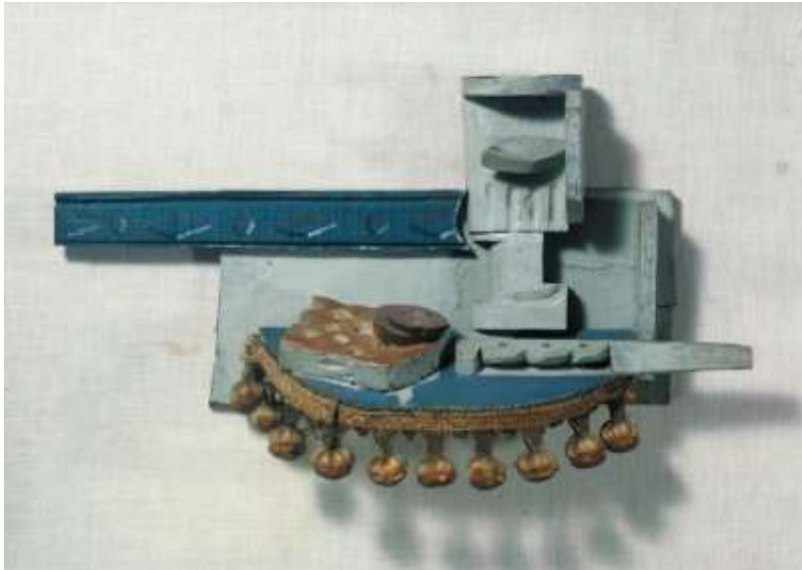
Fig. 5.9. Picasso. *Still Life* (1914)

Original in Colour

Fig. 5.10. Duchamp. *Bicycle Wheel* (1913)   Fig. 5.11. Arp. *Collage with Squares* (1917)

Fig. 5.12. Arman. *Little Hands* (1960)

Historically, this exhibition traced the concept of assemblage 'to earlier twentieth-century art practices, notably Cubist collages and constructions, and the Surrealist object' (Kelly, 2008:24). This corresponds with the tendency to credit Picasso with the introduction of collage and assemblage in art and offers further evidence of the historiography described above. However, as discussed previously, Tatlin and the Russian avant-garde also made a significant contribution to this transition.

> Maria Gough argues that Picasso's constructed sculptures of 1912 and 1913 "had the most profound impact" on Tatlin precisely because they had powerfully reinforced and even legitimated Tatlin's own nascent experimentations with faktura and three-dimensional assemblage (Taroutina, 2013:193).

Seitz has suggested that the field of art opened up to assemblage as a result of the associative method of visual poetry of the late 19th century (Seitz, 1961:13-17, Kelly, 2008:24, Torcellini, 2017:53), a literary phenomenon manifesting the fragmentation of knowledge caused by typography through its use of movable types, which was based on mosaic principles and enabled the production of serialised books (McLuhan, 2011). For Seitz (1961:13-15), '[t]he poetry of Mallarmé [...] suggested the confrontation of fragments as a literary method' and Apollinaire's method hinged on the juxtaposition of 'a mass of heterogeneous objects.' Seitz also considers popular art forms that created images and objects based on repetition of materials or actions significant in the inception of assemblage, and hinted that, in Italy, 'inlaid marble, intarsia, and mosaics'

(ibid:26) had some influence. However, Seitz plays down the contributions of Italian Futurism due to their nationalist agenda, favouring instead the French line of influence. In fact, Seitz's prejudices transpire throughout the text. On closer, and less biased, examination it is evident that these artforms belong to the constructive line of mosaic making as explored in part one. In other words, in articulating the frontal space of the canvas instead of the illusionistic behind, collage and assemblage, through Cubism, established the constructive principles of mosaic in 20th century art, 'producing new aesthetic results' (Torcellini, 2017:53) and expanding these additive principles associatively in their own right.

> When the scene behind the gold frame came forward and began to crack up or fade out (as it did in Mondrian's art of 1910-1915), abstract pictorial elements became more "real" than what they represented, and the gap between painting and sculpture narrowed until, in the abstract *tableaux-objets* that followed, the distinction was almost obliterated (Seitz, 1961:81).

Assemblage emerged from the articulation of the illusion of painting and the material reality of sculpture, *the very locus of mosaic art*. A 'mode of juxtaposition initiated before the 1900s' (ibid:39) and not simply an isolated 20th century occurrence. What is interesting in Seitz's exhibition of 1961 is the inclusion of the *Watts Towers* in the catalogue. The towers were built by Italian immigrant Simon Rodia in Watts, near Los Angeles, between 1921 and 1954 (fig. 5.13 & 5.14). Seitz uses these obvious mosaic structures to reinforce his views on assemblage regarding agglomeration and accumulation of discarded materials and objects by non-trained artists. Seitz prejudice is evident. He overlooks the fact that Rodia,[132] as a tiler had a practical understanding of composition and structural constructions. 'Perhaps Rodia remembered Italian mosaics but, as far as one can tell, for him environment and need supplanted tradition' (ibid:73).

Marshalling the towers as 'a unique creation of inspiring power and beauty, a master piece of assemblage' (ibid:79) in support of his category, Seitz sealed the fate of mosaic within fine art and established the wide-ranging scope of assemblage as a category. Inevitably, from 1961 onwards, mosaic gets misplaced within assemblage, which is envisaged by Seitz as possessing a 'transhistorical and transcultural nature' (Kelly, 2008:27). This issue adds to the unclear character of assemblage and corroborates

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[132] Simon Rodia is not credited in the list of artists in the catalogue.

the premise of this thesis: mosaic art needs to be reinstated and re-evaluated within contemporary fine art practices through the notion of the mosaical.

Fig. 5.13: Rodia. *Watts Towers* (1921-1954)

Currently, mosaic is regarded as a minor artform and tends to be understood simply as a manifestation of assemblage whenever exhibited in a contemporary art context or, occasionally, displayed as sculpture of a naïve strain. In fact, it is the opposite. Mosaic is much older and takes precedence historically, and its influence, as proposed here, is widespread. The methodological starting point of an assemblage by means of an additive compositional process through the juxtaposition of originally separate fragments or units is not 'so far-removed from that of Seurat, who constructed a painting using dot-like fragments of colour placed side by side' (Torcellini, 2017:53). However, mosaic as historical antecedent and the methodological departure point of assemblage itself, through the Russian avant-garde's experiments with faktura, is

overlooked by Seitz. Furthermore, the manifestation of mosaic in works such as the Watts Towers is seen as uninformed and naïve, a product of an *outsider artist*. This begs the question: how did mosaic art go from the most valued art medium in the Byzantine era to an alternative and outsider medium in the 20th century? The answer is not simple and takes into account the invention of the canvas and Renaissance artists' focus on single-point perspective, as well as other factors. Taroutina indicates that the demise of mosaic was a consequence of Enlightenment prejudices towards the Byzantine Empire (Taroutina, 2013:14), an issue beyond the scope of this thesis.

Original in Colour

Fig. 5.14. Rodia. Detail of the *Watts Towers* (1921-1954)

Although mosaic works tend to get subsumed within the generic category of assemblage, they offer visual clues that allows the viewer to identify more accurately mosaic principles as a source of all assemblage works. For example, the mosaicality of an assemblage is more noticeable in works with a high level of unit interchangeability and particular material aspects as well as homogeneity, regularity, seriality and repetition. This is along the lines proposed by Bruneau's account of mosaic[133] and, to a certain extent, no different from Rodchenko's concept of modularity. It is clear that most works exhibited in Seitz's show at the MoMA in 1961 do not address material homogeneity, unit seriality and repetition in such an obvious way. However, this fact

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[133] See chapter two.

does not invalidate assemblage as mosaical. Several pieces in the exhibition provided the evidence, such as the aforementioned *Collage with Squares Arranged According to the Law of Chance* (1916-1917) by Jean Arp (fig. 5.11) and *Little Hands* (1960) by Arman (fig. 5.12). Seitz points out that the notion of true assemblage first appeared in the work *Fusion of a Head and a Window* (1911-1912) by Italian Futurist Umberto Boccioni,[134] a work that is thought to predate Picasso and Braque's collages (Seitz, 1961:26). This supports the argument put forward in this thesis, that the French line of influence alone does not offer a convincing narrative.[135] Any assemblage composed through the additive method inevitably belong to the mosaical category, even if its originally separate units come from disparate sources and are not repeatable serially. Such assemblages present a heterogeneity of material and units that follow the logic of the icon and its incursion into real space as originally articulated by Tatlin. They are a consequence of mosaic principles and its additive method.

Chapter five has traced how mosaic principles have influenced sculptural practices of the 20th century by discussing the phenomenology of mosaic in relation to the staging and the viewing of sculpture. It has examined how Tatlin, based on the logic of the icon, experimented with faktura and moved his practice from the flat surface of the canvas to three-dimensional space. It has shown that, while Tatlin's practice was not that of a mosaic maker, his practical knowledge of mosaic and the Byzantine tradition contributed to his constructive notion of pictorial space. It has shown how Tatlin's interest in material heterogeneity paved the way for future generations to explore collage and assemblage, which, of course, was also partly a result of Picasso's influence. Tatlin brought forth mosaic principles such as unit heterogeneity and spatial articulation. In a direct reading Rodchenko's work, like Tatlin's, does not evidence a direct relationship with mosaic. In Rodchenko's case this is largely due to his interest in the constructive line, and the consequent tendency for his modulated and repeated independent units to be linear. Nonetheless, an element of modularity as well as the luminous and interstitial qualities of his constructions are undeniable. This chapter has shown how Rodchenko brought forth material homogeneity and the repetition of identical forms. Notably, Rodchenko's combinations of materials, and the subsequent advent of the readymade and mass-production, sees the return of mosaic principles through unit seriality, modulation and repetition in Minimalism, which is further

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[134] Boccioni was not included in Seitz's exhibition.

[135] As already mention in chapter one (footnote 28), Italian Futurism has also contributed to the unfolding of mosaic principles in contemporary fine art practices and Gino Severini is a key figure in this respect. Futurism, and Severini in particular, is not discussed in depth in my thesis.

examined in chapter six. In essence, chapter five has shown how the Russian avant-garde repackaged the tessera as a sculptural element ready for usage in both homogeneous and heterogeneous serial compositions.

This chapter has discussed assemblage as a specific category in art, as introduced by Seitz in 1961, and shown how assemblages fall necessarily within the tradition of mosaic making in its epistemic complexity. Assemblages are, to some extent, a consequence of experiments with faktura among the historical avant-gardes of the early 20th century, such as Cubism and Constructivism, and have connections with Dadaist objects and the advent of the readymade combined with serially mass-produced goods. An assemblage in its specificity pertains to compositions or arrangements of both heterogeneous and homogeneous units from heterogeneous sources or not, akin to the notion developed in *A Thousand Plateaus* (1998) by Deleuze and Guattari, where disparate units are combined in the same context, generating multiplicities, variable instances of meaning and effects, including aesthetic pleasure. Assemblages lacking seriality of uniform interchangeable compositional elements and material homogeneity are best exemplified by the Duchampian notion of the assisted readymade. Such assemblages developed their own poetics, losing their visual connection with traditional mosaic works. Assemblages characterised by serialised homogenous compositional units, material homogeneity and a considerable level of unit interchangeability are best exemplified by the works of artists associated with the New British Sculpture, discussed in chapter seven, that further evidences mosaic principles unfolding within sculptural practice. Consequently, notions of assemblage based on the juxtapositions of homogeneous or heterogeneous units are pertinent to the nature of mosaic itself. Evidently, various art practices of the 20th century developed mosaic principles three-dimensionally in one way or another, as assemblages based on material heterogeneity as well as in works that emphasised material and unit homogeneity and seriality. This clearly perpetuates distinctions that find their source in the experiments with faktura by the historical avant-gardes. The following chapter explores this in relation to the seriality of homogeneous repeated forms in Minimalism, focusing on Judd and Andre.

Chapter Six: The Sculptor as a Modulator

The previous chapter examined how mosaic principles unfolded within sculpture through the historical avant-gardes' experiments with faktura. That account focused on the materiological determination of both Tatlin and Rodchenko, and concluded with a discussion of assemblage as a category influenced by the notion of heterogeneity derived from Tatlin, among others. As a counterpoint to assemblage work, and expanding the topic on the phenomenology of viewing, chapter six explores seriality and homogeneity in Minimalism. In this, chapter six pays special attention to the experimental practices of Judd and Andre and suggests an alternative reading of their work.

Repetition and Seriality in Minimalism

According to Krauss (1977:245), the Minimalist approach to sculpture is characterised by the exploitation of 'a kind of found object for its possibilities as an element in a repetitive structure,' and 'the possibility of significance' that was driven by the placement and repetition of similar units and the regularity of the intervals between them. For Potts (2000:367), the 'fixed grid-like placements of equivalent units' in Minimalism emerged at a moment when sculpture was trying to consolidate itself as an autonomous practice free from theoretical constraints and associations with painting, so characteristic of High Modernism.[136] Potts (2000:xi) argues that Minimalist sculptors challenged the 'received aesthetic paradigm' by deploying unit seriality and repetition, as well as drawing interstitial and luminous qualities into their work. These can all be seen as formal parameters of mosaic making that infiltrated the practice of sculpture and contributed to the resolution of works by Judd, Andre, Dan Flavin and others.

The debate on Minimalism is mostly focused on: the notion of *objecthood*, which was introduced by Michael Fried's critical essay 'Art and Objecthood' (1967); an understanding of phenomenology as approached through the notion of theatricality; and, the concept of wholeness as formulated by Judd. Understanding these terms from the angle of mosaic principles can be revealing. As Potts (2000:xiii) suggests,

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[136] The issue of sculptural autonomy began in the late 18th century when public art galleries were created, 'a context where works of art were presented to be viewed as relatively autonomous entities within a public space' (Potts, 2000:1).

> [w]e need to engage with the verbal paradigms and cultural praxes which we surmise would have framed the viewing of the work for its original audience, and also *those possibly rather different paradigms and praxes within which our own viewing of the sculpture is embedded* [emphasis added].

Within the context of Minimalism, the mosaical is best exemplified through Judd's practice and Andre's; the former merged the pictorial and constructive lines of mosaic through 'optically activated geometric forms' (ibid:142), and the latter emphasised constructive notions of sculpture through poetry and the modulation of metal units in a way that 'almost de-solidifie[d] them, transforming them into shimmering planes of light floating just above the matt' (ibid:8).[137]
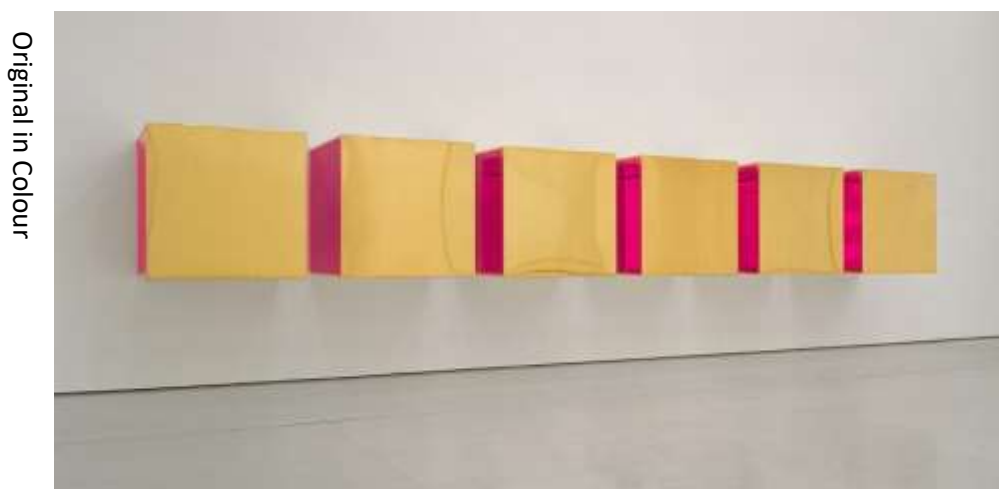
Fig. 6.1. Judd. *Untitled* (1973), Guggenheim Museum, New York.

The Mosaic Unconscious in Donald Judd

According to Potts (2000:235), in response to a discourse that 'marginalised the sculptural object,' Judd opened up a space between sculpture and painting by introducing the concept of 'specific objects.' In this, Judd argued for a work that moved from the two-dimensional formal constraint of painting towards the exploration of three-dimensional space, and landed on something that 'was not sculpture in the conventional sense either.' By developing this logic, Judd unwittingly began to deploy a

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[137] Note that Herbert Read conceptualised the term "glitter principle" referring to some American sculpture of the post-war period. The glitter effect derives from 'a fragmented sculpture through semi-random, reflective surfaces positioned in spatial configurations' instead of 'a continuous, coherent mass of metal' (Burnham, 1968:161). The *glitter principle* is a notion influenced by mosaic principles enfolded within sculpture, as explored in chapter five, and can be extended to particular works of both Judd and Andre. However, Read did not referrer to Minimalist practice as he wrote prior to its formal conceptualisation.

strategy that emerges from within the parameters of mosaic making. He located something between painting and sculpture that, for Gassner (1992:305-307), was a consequence of the Constructivists' experiments with faktura. Furthermore, Judd's practice favoured material homogeneity through serialised independent units, and payed particular attention to the interstitial qualities, colour and luminosity of those units (figs. 6.1, 6.7 & 6.8).

Krauss (1977:250-253) raises an interesting point regarding the nature of Minimalist practice. She notes that, like other Minimalists, Judd is 'solely concerned with the surface nature of the material' 'in structural or abstract terms,' and is in denial of 'the interiority of the sculpted form [...] as a source of [its] significance.' In this, Judd moved away from the tendencies associated with sculptors such as Naum Gabo and Henry Moore and, in articulating qualities that exist between the pictorial and the sculptural, touched on concerns that were introduced by Rodchenko and influenced by mosaic making. These concerns included the modulation of serially repeated forms, luminosity and the activation of space. As discussed previously, these are formal concerns that are deeply connected to the logic of the icon and Judd was aware of this logic, particularly in relation to colour, as the beginning of his article 'Some Aspects of Color in General and Red and Black in Particular' (1993) confirms. This article includes a passage about Giacometti, in which Judd mentions how an old Russian church created space, a discussion 'so far in advance [that he] will never get to it' (Judd, 2014 [1993]:265). This article evidences the strong connection between Judd's notion of spatial articulation and his approach to colour; 'Color[sic] and space occur together' (Ibid:275) as expressed in 'the traditional art of diverse civilizations' (Ibid:265).

In his article, 'Specific Objects' (1965), Judd introduced the notion of *wholeness* in sculpture, a concept that makes greater sense if understood in association with his article of 1993 discussed above. According to Potts (2000:279-280), Judd's account of this concept does not withstand scrutiny, the article is riddled with contradictions and the examples of wholeness cited in the text are at odds with the 'tenor of the earlier part of the essay' as they do not embody Judd's austere theoretical abstract imperatives. However, Judd's theory of wholeness, as expressed in that essay, provided a frame for his own practice; his sculpture revealed 'the imperative to create simple whole objects' by deploying discrete parts to form a consistent whole, which was a crucial aspect of this notion of wholeness. Potts (ibid:282) concludes that Judd did not have in mind simply a single sculptural form, such as in the work *Die* (1962) by Tony Smith (fig. 6.2). Rather, for Judd, wholeness was thought through in relation to the

articulation of serialised units in space and understood by experiencing it 'first and directly,' not 'through the contemplation of parts' (Judd, 1965 cited in Rahtz, 2001:155-156).

Original in Colour

Fig. 6.2. Tony Smith. *Die* (1962)

The idea of wholeness resulting from the combination of uniform discrete parts may seem contradictory at first. However, what Judd did, in fact, was to bring the very identity of a mosaic work to bear on sculpture: the tension between individual units as concrete palpable material and the overall composition as representation. This is appositely described by Gage (1999:84), and by Arnheim (1941:73) who states that such work is 'abstract from the viewpoint of representation, but concrete from the viewpoint of construction.'

> The wholeness is a wholeness achieved through the striking conjuncture of several discrete and relatively autonomous features of the work [...] made to coexist convincingly [...] shape, image, color[sic] and surface are single and not partial and scattered [...] All-overness is a critical issue [...] [It] encompasses the whole shape and does not separate out as a separate form (Judd, 1993 cited in Potts, 2000:282).

The mosaical unfolds in Judd as wholeness: the combination of discrete serialised repeatable parts coming together to form a consistent whole (see figs. 6.1, 6.4 & 6.6 to 6.8). Wholeness in this sense was a reaction against the secondary position of sculpture in the aesthetic discourse and practice, which was associated with High Modernism at the time. This is exemplified by the sculptural works of David Smith and

Caro (fig. 6.3), which were based 'on principles of collage or constructed compositions' (ibid), as championed by Greenberg in his essay 'The New Sculpture' (1948, in Greenberg, 1961).

Original in Colour

Photo: Mike Bruce ©Courtesy of Gagosian Gallery

Fig. 6.3. Caro. *The Window* (1966-1967)
©Courtesy of Barford Sculptures Ltd and the Tate Gallery

Furthermore, in 'Byzantine Parallels' (1958, in Greenberg, 1961), Greenberg suggests that the *extra-artistic* significance of Modernism is also understood through its connection with Byzantine art.

> The Byzantines dematerialized[sic] firsthand reality by invoking a transcendental one. We seem to be doing something similar in our science as well as art, insofar as we invoke the material against itself by insisting on its all-encompassing reality (Greenberg, 1961:169).

In this way, it is not unfitting that Judd's wholeness[138] functions as an alternative model for sculpture derived from formal elements of composition characteristic of mosaic

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[138] In his article 'Art and Objecthood' (1967) Fried criticises Judd's notion of wholeness by stating that it is necessarily concerned with shape, that is, a series of *single shapes* and not the experience that an artwork provides as a wholeness. 'The shape is the object: at any rate, what secures the wholeness of the object is the singleness of the shape. It is, I believe, this emphasis on shape that accounts for the impression, which numerous critics have mentioned, that Judd's and Morris's pieces are hollow' (Fried, 1998 [1967]:151). Furthermore, for Fried there was also an insistence on apprehending the artwork or a series of single shapes *in time*. He argued that wholeness was also present in High Modernist sculptures such as Caro's, despite Judd's critiques. For Fried, sculpture do not need to be experienced in time like theatre, because in 'a sculpture by David Smith or Caro in no time at all [...] *at every moment the work itself is wholly manifest* (ibid:167). Note that this discussion does not take priority within the present

making. Judd even deploys the element of inclination in some of his works. In relation to this, his *Untitled Plywood Piece* (1984), in the collection of the Stedelijk Museum Amsterdam, is exemplary (fig. 6.4). This piece belongs to a series that incorporate sloping planes. Mounted on the wall, the six open box units present various vertical angles of inclination, capturing and dispersing light, reminiscent of Byzantine parietal mosaic work. In other words, tilting is an inherent part of the work, combined with the interstices between the units to activate space. Furthermore, the seriality of units and regular placement of these units implies that the series could continue *ad infinitum*.

Original in Colour

Fig. 6.4. Judd. *Untitled Plywood Piece* (1984)

Within the context of his experimental sculptural practice, Judd pursued a characteristically mosaical approach to production. He was concerned with material homogeneity, which he developed through the deployment of uniformly repeatable units. In this, his work had an antagonistic relationship with High Modernism's emphasis on heterogeneity of form and parts, *both* inaugurated by materiological determination and the experiments with faktura at the beginning of the 20th century, as discussed previously. Even though, at the time, Judd was focused on the sculptural debate. Michael Polanyi (cited in Schwab et al, 2013:148) argues that things can reveal themselves 'in unexpected ways in the future' as they possess 'a significance that is

thesis, because the focus here is on the regularity of repeated units, not the heterogeneous sculptural appearance of High Modernist work.

not exhausted by our conception of a single aspect of it.' For Polanyi, a thing 'has the independence and power for manifesting itself in yet unthought ways in the future.'

Minimalist works such as Judd's were concerned with exploring what Fried described as *theatricality*. In other words, they were part of a move to explore the phenomenological engagement between the viewer and an artwork that impinges on his or her space. This interest in the phenomenological relationship between object and viewer is not unique to Minimalism and, as previously mentioned, pertains to the logic of the mosaic icon articulated by Byzantine practitioners.

Original in Colour

Photo: © Petar Milošević

Fig. 6.5. *Apse Mosaic*, Basilica of San Vitale, Ravenna (c. 547)

For Otto Demus (1976 [1947]:13-14), Byzantine mosaic was 'the legitimate successor of monumental sculpture' and articulated the spatial qualities of 'sculpture in the round' by intruding in to the space of the viewer. In this way, mosaic reversed the logic of the illusionistic picture plane by articulating the space in front of the image. Mosaic 'encased in cupolas, apses, squinches, pendentives, vaults and niches' were not two-dimensional due to the curvature of such places (fig. 6.5). Icons and sacred objects placed within the church were framed by its architecture as a whole, creating a 'reality of space' within which the viewer was not cut off from the divine space of the icons and sacred relics. The viewer was 'bodily enclosed in the grand icon of the church [...] surrounded by the congregation of the saints and [taking] part in the events he sees' (Demus, 1976 [1947]:13). Judd understood this sense of spatiality and alluded to it in his article 'Aspects of Color...' (1993). Furthermore, according to Potts' article

'Installation and Sculpture' (2001), sculptural practice associated with the radical installation works of the 1960s and 1970s belongs to a longer tradition of public displays deep rooted in Christian practice. For him, apprehending a sculptural object or an installational work is simply a matter of focused or dispersed attention; that is, one is either experiencing the work from a distance or immersed with in it, seduced by the details of a sculptural surface or dispersed around or within the work.

> The ritual spaces of viewing in modern museums may be very different in function and character from the ritual spaces of the early modern Christian worship, but the practice of devising visually striking public exhibitions of objects and images in interior spaces with a view to inducing in the viewer effects of immediacy and presence, and the ideologically charged sense of unease over the illusoriness and contrivance such publicly promoted spectacles can at times induce, are specific to both. They may seem natural only because they have been a feature of Western culture for so long, reaching almost baroque proportions now with certain recent installation work (Potts, 2001:20).

Following on from Demus' understanding of the historical and technical aspects of monumental Byzantine mosaic, Potts' assertion that installation is deep-rooted in Christian tradition and Taroutina's account of the influence of mosaic on the Russian avant-garde, it seems reasonable to see the unfolding of mosaic principles in Minimalist art as revealed through theatricality, or in Potts' (2000:236) words, 'the phenomenology of sculptural viewing.'

As previously noted, Fried introduced the notion of theatricality as a central element of Minimalism in his article 'Art and Objecthood' (1967). For Fried, this was a criticism of the changes occurring in sculpture of that period, particularly the shift of practitioners' attention away from the sculptural object itself and towards the 'staging of sculpture' and 'the impact a work had on the viewer sharing its space.' According to Potts (2000:236-241), Serra and Robert Morris stood out in this respect.[139]

> Morris brought into focus a potential tension between the public and the private dimensions of apprehending a work of sculpture, which at this point he negotiated by emphasising the public character of sculptural viewing, and by denying the legitimacy of any private communion with the object which modernist aesthetics seemed to privilege (ibid:237).

The notion of the public nature of viewing introduced by Morris was based on his own experience as an artist (he was originally a dancer) and conceived the viewer as a performer. In Morris' hands, the viewing of sculpture became 'a process acted out in

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[139] As mentioned previously, Serra was one of many American artists influenced by Josef Albers. He worked as an assistant to Albers during the making of *Interaction of Colour* (1963).

space and time' triggered by units that articulated specific spatial and temporal concerns (ibid:240), a practice that resonated with many artists including Judd and Andre.

Returning to Judd's practice, Potts (2000:285-290) suggests that articulating 'a clear defined whole,' through spatial compositions with repeated homogenous units, required precision and regularity. In other words, the interstitial qualities of Judd's units modulated in space set up a particular kind of relationship between the work and the viewer. In addition, Judd opened and extended the work to 'the space immediately around it,' and, as Potts points out, this further enabled a phenomenological engagement between the viewer and the work itself, rather than a purely conceptual experience. In this way the work facilitated a close physical engagement through an activated and 'internalised sense of occupancy of space' as exemplified by *100 untitled* shimmering units made of milled aluminium, installed in Marfa (fig. 6.6). Thereby, Judd's work restaged a relationship that can be paralleled to that at the core of the logic of the spatial icon.

> Judd's work, particularly those composed of a series of separate units, both offer the viewer a very simple clearly defined overall structure and block a conventional sculptural apprehension of this shape as an integrated whole [...] Insomuch as the work operates as a whole, this is located in feeling that something is there that both encloses a space and opens out to the shape immediately around it and manifests itself, not in the form of a single plastic shape or structure but of a variety of vivid particular sensations and aspects, some of which momentarily may seem disparate (Potts, 2000:290).

Original in Colour

Fig. 6.6. Judd. *100 untitled works in mill aluminium* (1982-1986)

As mentioned previously, Judd's articulation of space referenced tendencies that go beyond Modernism and connect with a distant past. He believed that colour 'had to occur in space' (Judd, 2014 [1993]:277) and began to deploy it 'as a phenomenon in its own right' (Potts, 2000:285) in a manner reminiscent of Tatlin, as discussed by Punin. In this concern with colour, luminosity became a central interest for Judd. According to Potts (ibid), Judd was preoccupied with the play of light on 'sharply defined surfaces and volume,' which led him to deploy 'materials with smoother, harder and more reflective surfaces.' Agee (2014:208) suggests that by flooding the intervals of his units with colour (fig. 6.7), Judd turned light into 'a volume itself.' In this way, his work clearly encompass both aspects introduced at the beginning of this chapter: the materiality of the work in connection with an additive composition associated with a spatial articulation of colour; and, the work's phenomenological engagement with an embodied viewer in space.
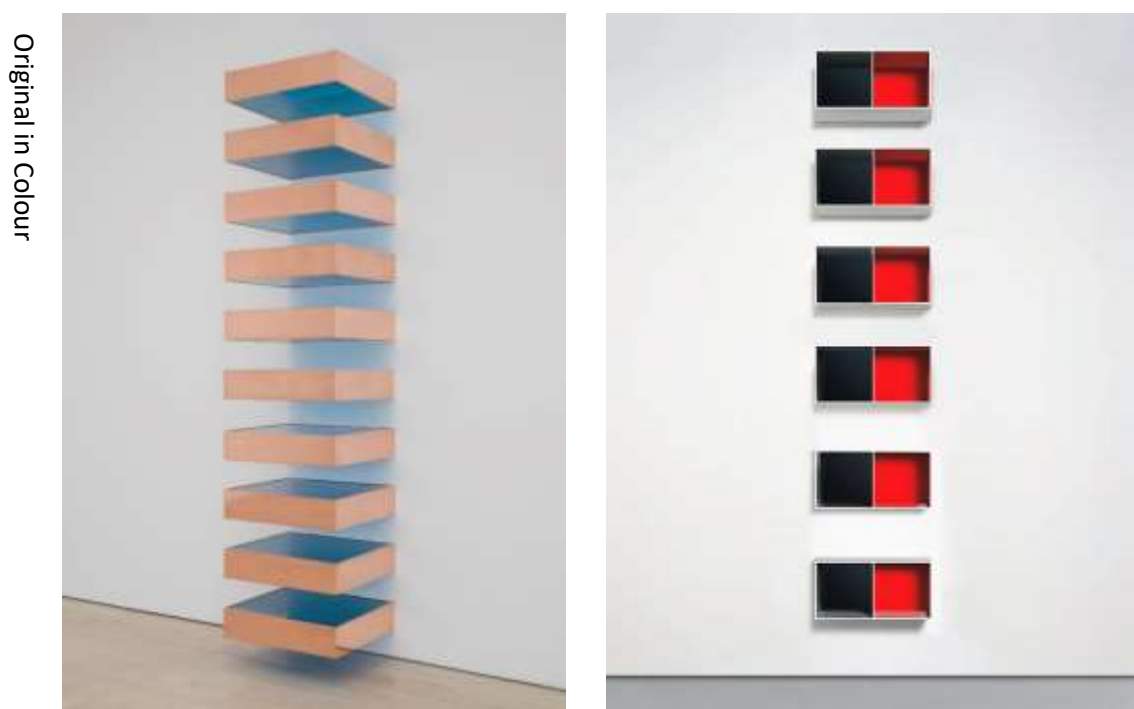
Figs. 6.7 & 6.8. Judd. *Untitled* (1987) and *Untitled*, Double Monochromes (1988)

In his article 'Donald Judd: Fast Thinking' (2000), Richard Shiff explains how the notion of additive mixture of colour plays a role in Judd's work, using the *double monochrome* series (fig. 6.8) as an example. Shiff points out that Judd invites the viewer to perceive his polychrome work simply as a monochrome. The viewer is expected to achieve a perceptual prowess once confronted with the double monochromes by *thinking fast* and not noticing the clear split between the two parts of the work. What Judd requires from

the viewer, and asserts theoretically, is not actually materialised in the work at all. Judd is concerned with moments of additive synthesis: two blocks of colours placed side by side to produce a third, lighter colour. However, that does not occur in these double monochromes. The synthesis of colour is not achieved because the units are not small enough. They do not behave like traditional tesserae seen from a distance as they are much bigger in size and therefore find it difficult to deceive the viewer's perceptual apparatus. Instead, the viewer is immersed within the spatial configuration of Judd's units of colour. They could be called macro-tesserae instead.

For Shiff, Judd departs from the principle of working from experience alone, which is attributed to Newman, and attempts to clarify the concept of wholeness in the work. However, as mentioned previously, Judd is describing a phenomenon that only happens in mosaic work composed of smaller pieces. Maybe, if the viewer went far enough from works such as the double monochromes that they could apprehend it from a great distance, the merging of the two colours in the retina might occur and they could thereby experience a fulfilled sense of wholeness. Unfortunately, the galleries are not long enough to provide Judd's viewers with the opportunity to exercise the *fast thinking* that these works anticipate. Nonetheless, this evidences how the principles of mosaic are present in Judd's concept of wholeness. Furthermore, in a later evaluation, Shiff concludes that actual colour mixing never occurs in Judd's work.

> Its individual colors[sic] –as well as their combinations– remained blatant and obvious. His combinations of hues appeared in simple juxtapositions; they neither dissolved into harmonious hierarchies, nor fell into a system of perspective, nor faded into atmosphere (Shiff, 2014:124).

The notion of Judd working from experience alone does not mean that he was unaware of developments in art and history. In fact, according to Agee, Judd was well versed in colour theory.

> Judd's knowledge of color[sic] and its history was long and deep ... [He read] Johann Wolfgang von Goethe, Michel Eugène Chevreul, Johannes Itten, Adolf Hölzel, and Josef Albers [...] He seems to have taken careful note of color practice in every period, from modern art all the way back to attic vase painting, Mayan art, Romanesque painting, Cimabue and Giotto, as well as illuminated Medieval manuscripts (Agee, 2014:197-198).

Judd's deployment of mosaic principles is more evident in the multicoloured pieces of enamelled aluminium he produced from 1983 onwards. According to Shiff (2014:116), the influence of Josef Albers is evident in these, 'twenty years beyond Judd's

assessment of Albers's theory.' Agee (2014:226) points out that Judd wrote about Albers and studied his work 'in greater depth' and was familiar with *Interactions of Color* (1963) (ibid:214). For Agee, much of the understanding of colour interaction that Judd drew into these multicoloured works 'had to do with longstanding principles of color[sic] usage' and referenced a range of precedents including Chevreul, Seurat and 'modern abstract painting...' (ibid:219). Shiff (2014:123) makes similar links, and describes how Judd aimed at keeping his colour 'discrete (diverse yet distinct)' and developed '[...] an improved version of Cézanne' by moving colour into real space.

In 'Donald Judd: the Multicolored Works' (2014), Marianne Stockebrand offers a comprehensive analysis of Judd's late pieces, from conception to production and eventual exhibition. For Stockebrand (2014:7-8), the multicoloured works installed together for the first time at the Pulitzer Foundation in St. Louis in 2013 (fig. 6.9) demonstrate a 'unique connection between art and architecture.' According to Stockebrand, the works 'looked like jewels' with the enamelled pieces 'offer[ing] an insight into the way Judd initially unfolded an opulent range of colors...' (ibid:8).

Original in Colour

Fig. 6.9. Judd at the Pulitzer Foundation, St. Louis (2013)

Stockebrand's essay provides evidence of Judd's careful planning of these pieces; aided by the RAL colour charts (fig. 6.10), Judd produced collages of colour schemes by placing paper cut-outs of colour samples side-by-side (fig. 6.13), very much like some

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of the exercises found in Albers' book *Interaction of Color* (1963), or tesserae in an *opus regulatum* andamento.

According to Stockebrand (2014:19), Judd was 'interested in a structured color[sic] distribution that would adhere to principles of order prescribed by the artist and [was] in no way left to chance.' To some extent, by modulating his colour spatially, as a readymade taken directly from the charts, Judd was restaging Cézanne's use of paint as a 'readymade,' applied directly from the tube (Sjåstad, 2014:95). David Batchelor (2000:105) argues that, through charts, commercial colours broke the well-established hierarchy of *art colours* represented by the tube of paint. For Batchelor, the colour chart is 'simply a list, a grammarless accumulation of colour units' that officially 'turn[ed] every colour into a readymade.' Commercial colour charts resemble the *smalti* sample boards produced in Italy for mosaic making, where every colour is an actual three-dimensional unit (fig. 6.11). In fact, it is notable that Judd's preparatory collages (fig. 6.13) functioned very much like cartoons, the preliminary drawings traditionally prepared for mosaic works.

Judd's late pieces seem to have had many influences, including the Guatemalan painter Al Jensen. A comparison of one of Jensen's paintings (fig. 6.12), Judd's collage studies (6.13) and one of Judd's floor pieces (fig. 6.14) draws attention to the shared additive approach of that links these compositions and further evidences the mosaical within Judd's work. In fact, Judd's notations and colour progressions seem likely to be making a direct reference to Jensen's work 'Al Jensen, from Guatemala, from among the Maya' (Judd, 2014 [1993]:279).

There seems to be a consensus between Stockebrand, Agee and Shiff that Judd's late pieces are something brand new. According to Agee (2014:219), they were 'a new and independent medium.' For Shiff (2014:129-139), they respected 'the independence of the colors[sic] while recognizing[sic] their collective wholeness [... and] ran afoul of conventional practice' and Stockebrand (2014:15-34) claims these multicoloured works were

> [...] a new bid to achieve his long-term objective of fusing two-dimensional painting with the three-dimensional object within a single work [and achieve] the balance between individual elements and the larger whole.

However, these critics tend to see Judd's colour articulations in space as disconnected from the broader tradition of mosaic that the present thesis articulates. This thesis

argues that, while Judd's pieces develop their own unique poetics, as Stockebrand, Agee and Shiff suggest, it is important to also recognise that they expand the tradition of bringing mosaic into sculpture and spatial articulation that was inaugurated by the Russian avant-garde. In other words, it is not a coincidence that Judd's works look and operate as they do, but a matter of manifestation of mosaic principles and their relationship with architecture, painting and sculpture all at once.

Fig. 6.10. Judd's *RAL Colour Chart Samples* (c. 1984)

Fig. 6.11. *Smalti Sample Board*, courtesy of Mosaic Art Supply

Fig. 6.12. Al Jensen. *Twelve Events in a Dual Universe* (1978)
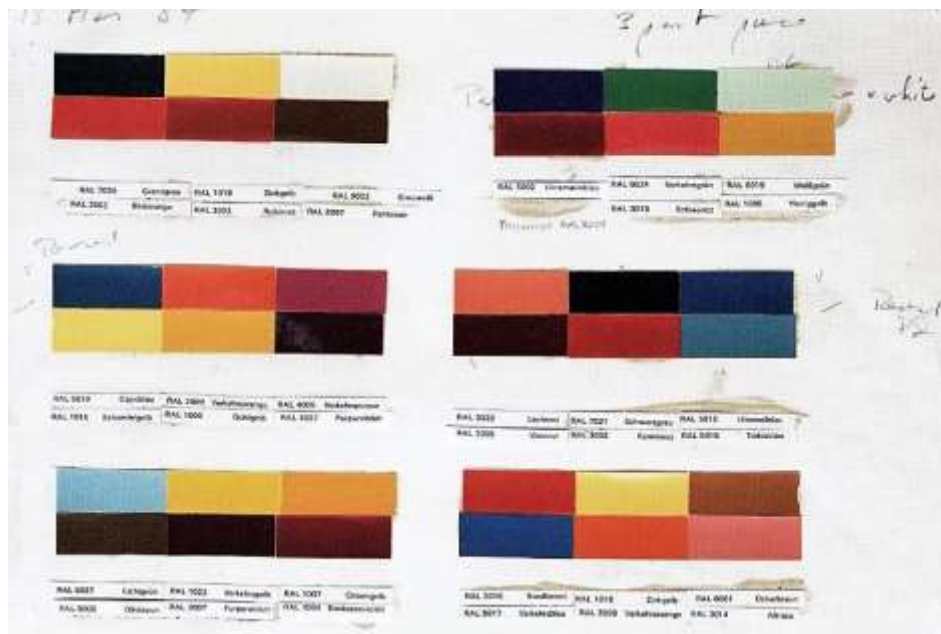
Fig. 6.13. Judd. *Untitled*, Collage Study (1984)

Fig. 6.14. Judd, *Untitled* (1991), Museum of Modern Art, New York

By moving from painting to *specific objects*, Judd paralleled the paths taken by both Tatlin and Rodchenko[140] and his multicoloured works provide compelling evidence of mosaic principles enfolding and unfolding within sculpture. Judd's later pieces brought the influence of mosaic, inaugurated by the Constructivists' exploration of faktura and the spatiality of the icon, full circle. The serialised colourful units of Judd's late pieces articulate space through a kind of tessellation, and include a sense of 'decoration.' In this way they contain a clear reference to tessellation that is not present in the sculptures of Tatlin and Rodchenko, but do not look like a traditional mosaic either. As suggested above, Judd's work owed much of this to the influence of Mondrian and Albers, as well as Jensen.

Considering the analytical framework provided by Rheinberger, and discussed by several other practitioners in *Experimental Systems* (2013), the series of works Judd produced through the constant repetition of related forms suggests that he was immersed within an experimental system, like Cézanne in his series *Mont Saint-Victoire* or the 'hundreds of apples [painted] in his countless later still lifes' (Schwab, 2103:215). Judd's *experimental system* can be analysed through the parameters of a contemporary mosaic practice. For Rheinberger (cited in Schwab:82),

> Experimental systems not only contain submerged narratives, [...] experimental systems contain remnants of older narratives as well as shreds and traces of narratives that have not yet been related.

Consequently, Judd's *wall progressions* and *stacks* can be interpreted within formal mosaic constraints: they are clearly experiments with tesserae and interstices (figs. 6.7, 6.15 & 6.16). Judd moved from painting to a practice of spatial articulation that centred on deploying repetitive, interchangeable units of colour reliant on light shining on or through Perspex, configurations that are reminiscent of Gothic stained-glass windows and Albers' early glass compositions. In this sense, it is evident that Judd's practice followed the logic of stained-glass explored in chapter four, and has a direct relation with Prikker's work and the Symbolist window, as suggested by Krauss.

Furthermore, Judd's approach to making echoes that disseminated through Albers' didactics. In his late pieces, Judd activated his colour spatially by dealing with light bouncing off the fragmented surface of the work, like a mosaicist. He deployed both the light-through of stained-glass and the light-refracted of mosaic work and painting.

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[140] Note that colour was not such a central concern for the Constructivists as it was for Judd.

However, Judd's work is considered *high art* and therefore analysed according to the usual hierarchised view of art, which leaves mosaic out of the picture. In other words, in relation to Judd's work, the narrative of mosaic is hidden within the interstices of normative art-historical discourse. Therefore, the reading of Judd's practice proposed by this thesis might seem incongruent at first. Nonetheless, the evidence unfolded by the research suggests a clear connection between Judd's work and the ancient practice of mosaic making, and its derivations throughout the centuries.

In conclusion, the mosaical unfolds in Judd's work by functioning as a consistent whole through the staging of the units in space, the colour interactions and the emphasis on luminosity through the modulation of repeatable serialised units. The materiality of a single repeated *spatial tessera* and the tension of the whole compositional scheme constructs an all-encompassing phenomenological experience that is not fixed to a single point or perspective. Furthermore, Judd's late pieces present another phenomenological quality that relates to mosaic work, known as *optical lift-off*. This quality further connects Judd's work to mosaic. Agee (2014:223) identifies this quality in Judd's work when 'the [multicoloured] pieces [...] look lighter than they actually are (because color[sic] tends to float, and the aluminium is thin) – a quality Judd aspired to in all his work' and this establishes an interesting connection between Judd's work and Andre's

Original in Colour

Fig. 6.15. Judd, *Untitled* (1969)

Original in Colour

Fig. 6.16. Judd, *Untitled* (1988)

Like Judd and other Minimalists, Andre's sculptures are characterised by the combination of serialised independent interchangeable units 'to form a grouping that might be called a sculptural composition' (Krauss, 1977:250), further exploiting the possibilities of the readymade inaugurated by Marcel Duchamp, which includes the infamous paradigmatic urinal (*Fountain*, 1917).[141]

> Mass production insures that each object will have an identical size and shape, allowing no hierarchical relationships among them. Therefore, the compositional orders that seem to be called for by these units are those of repetition or serial progression (ibid).

Andre's practice is not that of a painter articulating colour spatially like Judd. His practice is better associated with material literality and the negation of symbolic value. Bochner (1995 [1968]:94) notes that 'Andre works within a strict, self-imposed modular system.' In this way, Andre's approach is very much a constructive affair, both conceptual and methodological. His works made of bricks, for instance, are literal constructions of units arranged side by side on the floor of the gallery, a fact that generated a high level of controversy among the public when *Equivalent VIII* (1966) was purchased by the Tate in London (fig. 6.17). The work caused 'a certain amount of puzzled and angry commentary' (Potts, 2000:324). However, what is interesting from the frame of reference of the present thesis is the fact that Andre modulated regular serialised units in space, and by doing so, he deployed the constructive mode of structuring the visual. That is, he followed the constructive line of mosaic making through an additive process, as examined in chapter two.

Andre's sculptural arrangements are thought to be influenced by his work as a concrete poet (fig. 6.18). In an analysis of Andre's poetic approach, Liz Kotz (2010:140-148) suggests that his placing of written language in grid-like formations played a crucial role in his sculptural practice. For her,

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[141] In a recent article by Dutch writer Theo Paijmans titled 'Duchamp's Brutal Act' (2018), the attribution of *Fountain* (1917) to Duchamp is challenged. According to Paijmans, he did not create the urinal, but claimed it in the 1960s when his work was rediscovered by a new generation of artists. Paijmans' compelling evidence shows that the urinal was conceived by German Dadaist artist Baroness Elsa von Freytag-Loringhoven, who signed it 'R. Mutt' referencing the German word for poverty 'Armut' and submitted it anonymously to the inaugural exhibition of the Society of Independent Artists in New York. The attribution of the work to Baroness Elsa has been challenged before, an attribution that is vehemently denied by the major museums and the art-market to secure their investment and avoid financial loss through the possible devaluation of Duchamp's oeuvre.

[... Andre's] models of visual art differ from the pictorial or gestural models used to relate poetry to painting. In Andre's case, not only is language mapped out on sculpture but the reverse is also true. [Andre uses ...] what he terms "classic structures," employing "identical units of easily obtainable, everyday functional materials" subject to continual arrangement and rearrangement (ibid:147).

Fig. 6.17. Andre. *Equivalent VIII* (1966), courtesy of DACS
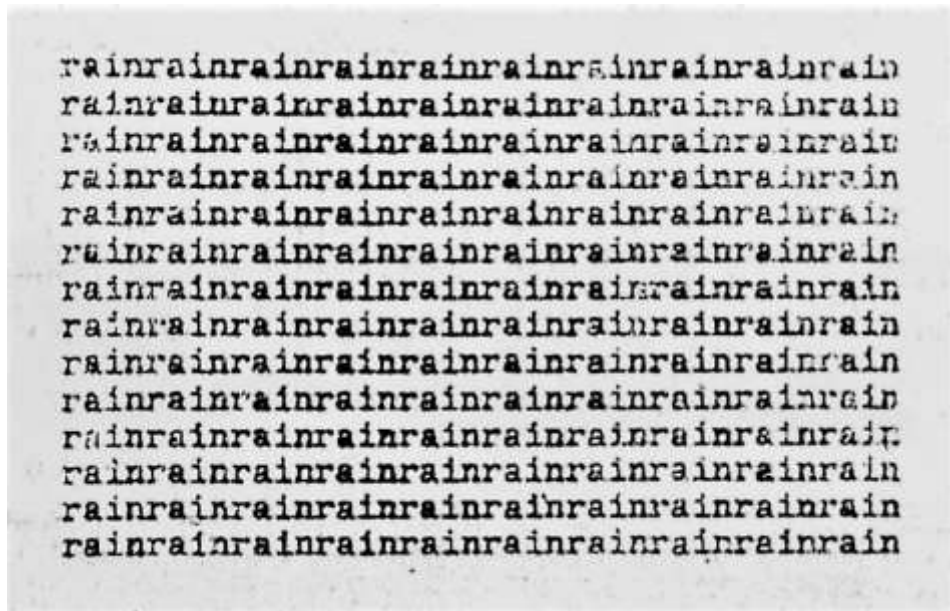
Fig. 6.18. Andre, *rain*, in *Passport* (1960)

Andre isolated words out of regular syntax through a process called *a cut* that is both literal or physical and filmic. These *cut* units of words were then reconfigured spatially on the page using a modular, additive approach. In this way, Andre's operation divided

and reassembled 'a series of fragments or particles' (ibid:141). However, instead of creating lineal narratives he concretised them, so to speak. Furthermore, by using a manual typewriter, he restored 'the tactile quality of letters […] with their inevitable variations in ink density, sharpness, and force of impression' (ibid:146). The typewriter offered Andre a kind of machine-like grid, which reveals an aspect related to mosaic principles that is extremely relevant to the discussion in hand. As discussed in part one, according to McLuhan, the Gutenberg printing press borrowed mosaic's *opus regulatum andamento* in combination with the movable type. In other words, it employed interchangeable units, a limited number of letters, that were fixed to a grid and used to create a visual (sequential) narrative. Consequently, concrete poetry can be understood as mosaical, for it 'explores the semantic and visual variations of our verbal resources, with regards to the orthogonal grid that underlies our typography' (Abadal, 2012:13).

While Andre's work does not directly employ constructive methods in its making, Andre is, nonetheless, *picturing* through his poetic practice and is thereby collapsing the constructive and pictorial lines of mosaic into a single work. Kotz (2010:147) suggests that in Andre's practice 'the ruled typewritten page [was] analogical to the space of the gallery' and in this she opens up 'a different perspective on his work.' Of course, the mosaical in Andre's work is not as obvious or easy to interpret as in the multicoloured works of Judd. However, there is another aspect of Andre's concrete approach to sculpture which is evident in the luminosity of his metal carpets from the 1960s, it is the notion of *optical lift-off*, which reveals links between this work, Judd's and previous forms of mosaic art.

Optical lift-off is one of the characteristics of Byzantine parietal mosaic. It is created by boundless areas of serialised and tilted golden tesserae in combination with careful modulated coloured tesserae. According to Hills (1987:29), 'the nature of the individual units of colour […] and the deliberate irregularities of their setting […] induce scattered sparkle or lustre upon the surface.' The perceived surface appears to float at a slight distance from the surface of the mosaic itself; it creates an optical lift-off. In *The Light of Early Italian Painting* (1987), in a chapter dedicated to Cavallini and the mosaic tradition, Hills references earlier studies by David Katz and discusses the phenomenon of optical lift-off in detail, using the term *film colour* to denote a distinction from *surface colour*. Hills describes film colour as the consequence of surface modulation where no dark contour or shading lines are applied to the figures represented; figures are not delineated and are 'set against broad expanses of unbounded field, where hues merge

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and blend, rather than meet in linear contours' (ibid:31). Film colour hovers in space in front of the surface.

> [There is] no boundary or contour, [...] colour will not be perceived as precisely located in space, and if it assumes any orientation it will be frontal [...] A film colour by its very nature appears luminous rather than illuminated. Regardless of what terminology we may choose [film colour or optical lift-off], the perceptual distinction between surface and film colour is the key to the late antique and early medieval mosaics' reconciliation of surface and space, vestment of wall and pictorial illusion (ibid).

Fig. 6.19. Andre. *Steel Zinc Plain* (1969), courtesy of DACS

Fig. 6.20. Andre. Detail of *Copper Zinc Plain* (1969), SFMOMA

In *The Sculptural Imagination* (2000), Potts dedicates a chapter to Andre, discussing in detail the 'metal carpets' (figs. 6.19 to 6.21). In this, Potts (2000:312-17) claims that

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these works 'cut in space' and are created to be 'looked down upon.' These 'sculptures always keep one at a distance visually. One never gets closer than the gap separating the eyes from the feet' (ibid:321). They are not like traditional sculpture that one can get close to and inspect in a vertical viewing. Rather, they invite the viewer in, enticing the viewer to walk over and around them as well as stand in the middle (fig. 6.20). Potts (ibid:317) suggests that the key to understanding these works lies in considering the importance of their *optical effects*; due to the side-by-side placement of the metal units, a viewer moving around the sculpture can sense 'subtly shifting reflections, [...] an effect of optical lift-off begins to occur.' For Potts, the works 'galvanise into a self-activating metal expanse hovering in space'.

> What sets the metal plates off from the floor and gives them a clarity and vividness of definition is the variegated play of light on their smooth dense, partly absorbent and partly reflective surfaces. [...] The work is not a single boring flat sheet but is broken up into close-fitting facets lying almost but *not quite perfectly flush with one another* [emphasis added] (ibid).

What is clear from Potts' description of the metal carpets is the way in which optical lift-off is determined by the formal regularity of each unit, their placement and *slight inclination*, as well as the play of defined interstices. As the units do not attempt to delineate a figure and are modulated, film colour occurs.

> The sense of a single expanse of optically animated surface almost suspended in space is a complex one. It is activated by a tension between a more purely visual apprehension of the work and an equally immediate awareness of it as an assemblage of heavy elements anchored in the flat, solid supporting ground (ibid:317-318).

If Andre had presented a single sheet of metal on the floor, the effect would have been different, the work would have behaved like a big mirror, a highly reflective surface. In contrast, his 'pure modulation of surface' (Ibid:319) is indebted to the intrinsic qualities of the metals, alongside the placement and seriality of units. Andre's metals 'were pure elements, not alloys,' and had 'neither artistic nor natural associations' (ibid:325). The purity of the metals is significant, not least because it connected his work directly with the Byzantine tradition of metallic tessellated surfaces. Among the work that evokes this Byzantine connection, the strongest is Andre's *37 Pieces of Work* (1970) (fig. 6.21), the largest of them all, installed at the Guggenheim Museum in New York. The work is arranged alphabetically according to the chemical symbols of the metals he used to produce the pieces, such as aluminium, copper, steel, magnesium, lead and zinc; Al,

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Cu, Fe, Mg, Pb, and Zn, respectively. However, the work is not simply a typology[142] of materials. It activates the space of the gallery; it engages in a form of *place making* (ibid:322). As Potts puts it, these carpets operate by simultaneously negating and reaffirming 'specifically sculptural values' (ibid:324).

Fig. 6.21. Andre. *37 Pieces of work* (1970)

By setting a stage for the viewer to occupy in a literal way, with serialised pieces of metal, Andre's floor-based works are closely related, and comparable in meaning, to a floor mosaic. According to Molholt (2011:287),

> [t]he meaning of the Roman floor mosaic was inseparable from its experience as a tangible surface, one typically appreciated by an ambulatory viewer situated in and aware of a specific architectural setting.

Molholt (ibid:288) adds that the importance of walking across these surfaces cannot be underestimated; floor mosaics entail 'immersion and immediacy' on the part of the viewer. In this sense, floor mosaics offer an experience that involves a phenomenological engagement that prompts 'a larger cognitive, perceptual, retinal, and epistemological effort toward understanding.' Here, Molholt's analysis is clearly modelled on Merleau-Ponty's notions of a 'lived perspective of the visible world in

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[142] Typology as a counterargument for the mosaical is examined in chapter seven.

relation to our living body.' According to Molholt, Merleau-Ponty 'describes perception as our kinaesthetic, prescientific lived-bodily presence to the world' and provides support for the notion that, by moving, the viewer becomes 'actively engaged in the narrative unfolding underfoot.' This notion is also valid for the analysis of Andre's metal carpet-like pieces. From this angle, it can be claimed that, by articulating the space of the gallery through arrangements of regular units of metal on the floor like a mosaic, Andre unwittingly equated his work with the golden surfaces of Byzantine parietal mosaic, thereby further evidencing 'the ambiguous status of his work as sculpture' (Potts, 2000:324). In other words, with his 'carefully controlled manipulation of movable units' (ibid:327), Andre tapped into a mode of structuring the visual that has been perpetuated by mosaic making for millennia.

Mosaic principles unfold in Andre's concrete poetry, and in the modulated floor sculptures that share their space with the viewer in a way that is comparable to ancient mosaic floors. Furthermore, due to the material, serialisation and modulation of Andre's floor pieces, they produce an optical lift-off as the viewer moves around them. This effect also links Andre's work to Byzantine parietal mosaic with its tendency for the image to hover above the surface. These connections are not coincidental or accidental. They are a direct consequence of principles of mosaic making employed by Minimalist practitioners through the guise and influence of Constructivism.

In conclusion, this chapter has examined how a fully-fledged volumetric unit was realised with Minimalism. It has elaborated on the constructive approach to making, when the mosaical seems to resolve itself and become more evident within sculptural concerns, contrasting with the heterogeneity of assemblage and the sculptural forms of High Modernism. This chapter has expanded on this, showing how Judd's work and writings advocated a kind of wholeness in sculpture (from separate parts) that parallels the wholeness of a mosaic composition in a pictorial sense, as they are both made of serialised and repeatable units, dependant on material homogeneity and modularity. Judd's late pieces are a clear resurfacing of the tessera element that enfolded with the practical application of colour theories by the Post-Impressionists and Vrubel's actual engagement with mosaic work. In essence, in moving away from painting, Judd unwittingly deployed mosaic principles of seriality, repetition, colour modulation, luminosity, inclination, spatial articulation and, most importantly, the principle he conceptualised as *wholeness*; and, in this he reinforced the mosaical nature of Minimalist practice.

The Minimalists moved away from the constraints of painting and centred the aesthetic debate on sculpture, retrieving mosaic principles through unit and material homogeneity in serialised compositions. In doing so, they were negating heterogeneity and the scattered look associated with the assemblage nature of High Modernism's sculpture, which operated as three-dimensional versions of Cubist painting and collage[143] and reinforced the heterogeneous nature of the building block, which, as explained in chapter five, was initially explored by Tatlin. Notably, Minimalist artists deployed variations of 'macro-tesserae' in homogeneous and serialised repetitions, which gave much of their work a particular kind of interstitial quality. These formal values associated with mosaic were taken up in Judd's later works, which focused on composing with smaller partible units. In this, Judd engaged with mosaic principles instead of purely pictorial or sculptural ones and his *specific objects* methodologically situated his practice somewhere between painting and sculpture. As this research has shown, not only is Judd's practice mosaical but modularity, repetition and seriality are evident across the work of Minimalist artists, including Flavin, Robert Smithson, Sol le-Witt and many others.

Andre's practice sits alongside Judd's as a good example of the mosaical unconscious in Minimalism. This chapter has shown how, in Andre's case, metal carpet-like pieces play with luminosity through serialised units in a way that is comparable to the golden expanses of Byzantine mosaic. Andre's work presents an optical quality known as lift-off that is essential to the experience and phenomenological understanding of the pieces. In other words, these metal arrangements operate in a similar way to ancient mosaic floors by bringing horizontal viewing to the fore and sharing the same space as their viewers. In this, they force the viewer to look down on them and move around, thereby experiencing subtle variations in perspective and luminosity. This chapter has also acknowledged that Andre started as a concrete poet, and noted that this links him to another facet of the mosaical, the alphabet and the technology of the printing press as discussed in McLuhan's analysis of the grid and movable type.

The analytical framework presented in this chapter is unusual, primarily because it brings to the fore ideas that have not been consistently discussed in fine art due to the ostensive hierarchical positioning of painting. The account put forward here overturns that positioning and establishes the existence of lines of flight connecting mosaic and Minimalism. As mosaic has long been pigeonholed as a craft, and thereby seen to be

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[143] Chapter five.

devoid of expressive potential, this interpretation might sound incongruous. In essence, this thesis is able to offer an alternative analytical framework due to the input of my own mosaic-centred practice. My experimental system, constrained by mosaic principles, has not only revealed unexpected material circumstances, but, through continued iteration, it has also revealed hitherto hidden aspects of past practices. Thereby, this thesis is able to contribute a new approach to the historicising of movements such as Minimalism. In pursuit of this, this chapter has shown the significance of the mosaical in the case of Minimalism, while also unpacking how mosaic, as a mode of structuring the visual, is rooted deep within Western culture and operates beyond medium specificity. This understanding of mosaic challenges the hierarchical art-historical approach and contributes to a re-evaluation of contemporary visual culture corresponding with the paradigmatic shift proposed by McLuhan. For example, there is a particular correspondence here with McLuhan's notion of an Electronic age characterised by the return of pre-modern structures such as organic, non-lineal, re-collectivised and retribalized experiences in phenomenological space.

PART THREE: CONTEMPORARY PRACTICE

Chapter Seven: Material Modulation and Digitality

The influence of mosaic principles in the Russian avant-garde, and the repackaging of the tessera as a sculptural unit through the work of Tatlin and Rodchenko, was articulated in chapter five. Chapter six examined how this was taken up by Minimalism, through the practices of artists such as Judd and Andre, as a response to the positioning of sculpture as a derivation of Cubist painting and collage. Together, these previous chapters presented two distinct lines of mosaic influence, one based on material heterogeneity and the other on homogeneity coupled with the deployment of serialised units of composition and construction. As these chapters showed, unit heterogeneity played a major role in assemblage as well as the sculpture of High Modernism, while serialised homogeneous units were fundamental to Minimalist practice. The present chapter further develops the mosaicality of assemblages by introducing my own work[144] within the context of contemporary fine art practice. It also articulates the unfolding of mosaic principles in the 1980s, both in Britain and Brazil, and connects sculptural practice to the realm of the digital, pointing towards a new materiality within which the constructive and the pictorial lines of mosaic merge once again. The final section of this chapter offers an examination of typology as a form of counterpoint.

Material Modulation

In exploring the connection between mosaic and assemblage through my art practice, I have produced several works over the past few years that have probed the limits of the mosaical. *Surface* (2015), a collaborative site-responsive installation created in Ramat Hasharon, Israel, highlighted material heterogeneity through mosaic principles. The work was made of a vast range of materials and objects, including small artworks, that were donated by a group of participants[145] and facilitated by the curator Dr Sorin Heller.

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[144] A full articulation of my own practice as an experimental system takes place in chapter eight.

[145] Collaborators: Cochava Bar-El, Rahiba Baransi, May Bassis, Romi Bassis, Noa Ben-Or, Sharon Borak-Schwartz, Judith Broitman, Hava Carmeli, Valeria Comerlatte, Aviva Entes, Jacob Faig, Ronit Freund, Einat Gal-Or, Benny Hasser, Lili Hirschberg, Zipi Lustig, Liora Ben Nissan Massika, Dalia Matmon, Audrey Meyer-Munz, Rachel Mirski, Rachel Navon, Juraj Novak, Ayah Orpaz, Irit Orpaz, Yael Peleg, Roni Rimer, Edna Ronel, Yael Segev, Gali Segev, Tchiya Shahaf, Chava Shmueli, Danit Shmueli, Ely & Avi (Tiv Helek) and Bastiaan van Werven.

Echoing the approach of the New York collective Group Material (1979-1996), this work invited participants 'to donate things that might not usually find their way into an art gallery' (Bishop, 2005:112). The resulting mosaic, or assemblage, (figs. 7.1 & 7.2) originated from my engagement with mosaic art education in Israel and my interest in the recontextualisation of it for 21st century artists and audiences. To address specific aspects of the gallery, *Surface* was divided in three parts. This was based on the grid as a means of ordering the surface area of the floor, which playfully juxtaposed the methodology of ancient mosaic with the contemporary concerns of installation art. One of the visitors called me *a magician* and described *Surface* as a material symphony in three parts. This modulation of materials and objects also addressed the concept of *transfunctionality*[146] by posing questions of value, hierarchy, territoriality and material culture. Paralleling the curatorial approach associated with Group Material, *Surface* 'reflected a belief that all cultural objects are equally important manifestations of ideology' (ibid).

Fig. 7.1. de Melo. *Surface* (2015)

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[146] Transfunctionality is a concept developed by Henri Lefebvre. It is explored further at a later point in this chapter.

Fig. 7.2. de Melo. Detail of *Surface* (2015)

Figs. 7.3. & 7.4. de Melo. *Light Modulating Net* (2017)

In Brazil, I had the opportunity to create an installation work for the *VI Curitiba Mosaic Biennial* (figs. 7.3 & 7.4), and I employed material homogeneity, seriality and repetition of units to articulate an architectural corner. For *Light Modulation Net* (2017), I

considered spatial and luminous aspects of this unique gallery setting to propose a phenomenological engagement between viewer and artwork. In this piece, mosaic principles were used to produce a work that was not wall- or floor-based in a traditional sense. Rather, the material used created a sensual lightweight sculptural form that explored the ancient connection between mosaic and textiles and the way that this connection operated as a trigger for optical studies in antiquity, as suggested by Gage (1999), Kuehni (2011) and Smith (1996). In deploying units of colour on a grid structure, this work also alluded to low-res computer graphics.

The works described here expose the viewer to an experiential notion of the mosaical and push at its limits. These pieces serve to clarify the mosaical as a fluid category in contemporary fine art by emphasising that mosaic is not simply an additive method of composition commonly identifiable by repetition, serialisation and a certain level of interchangeability of elements at surface level. Its identification is more complex. Crucially, the mosaical operates here as a notion that can be used for the analysis of spatial articulation and the phenomenology of viewing. Regarding the issue of assemblage and mosaic principles based on the modulation of serially independent units, it is also important to explore the work of other recent practitioners, specifically those associated with the New British Sculpture of the 1980s.

Original in Colour
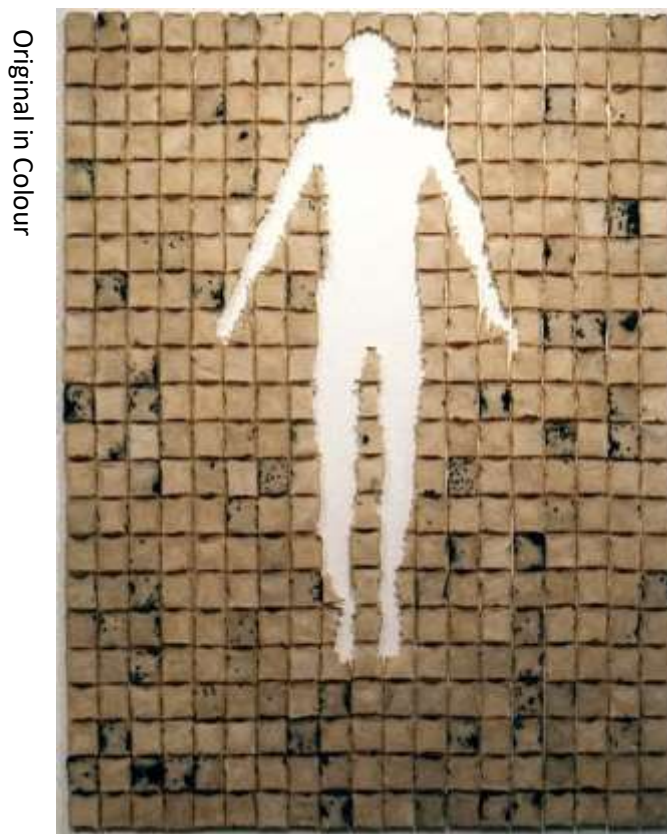
Fig. 7.5. Gormley. *Consumption* (1982), courtesy of the artist

From Units to Pictures and Structures

According to Greg Hilty (2016), the 1980s generation of British sculptors were not afraid to open their discipline to wider material and conceptual concerns. 'Trained in the rigours and inspired by the ambitions of conceptual and minimal practice' (Hilty, 2016: online), these artists deployed materials in an interesting way, characterised by a varied narrative, ranging from affect to humour. This was a generation that reacted 'against the Greenbergian, New York-centred, painting-focused hegemony that had dominated curatorial and critical discourse during the 1950s' (Baker, 2016: online). Most importantly, it is the methodology of making that connects this generation with mosaic principles; material modulation presented as constructions of repeated serialised units or assemblages.

> The object used and manipulated [by] the[se] artist[s] hybridise[d] and transform[ed] sculpture into fragmented assemblage that [...] marks a true "metamorphosis" of mosaic (Panzetta, 2017:27).

Original in Colour
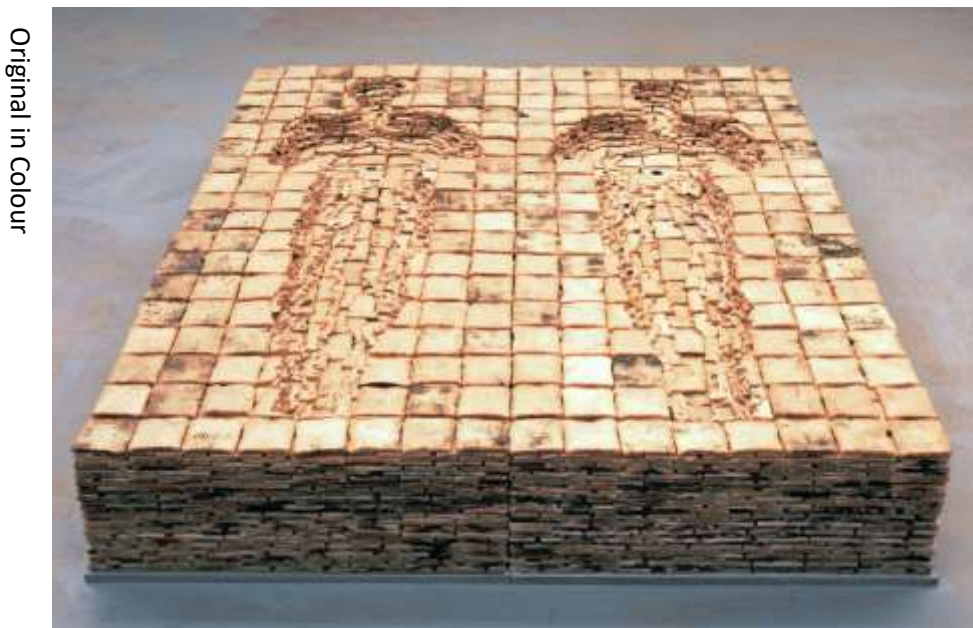
Fig. 7.6. Gormley. *Bed* (1980-1981), courtesy of the artist

Antony Gormley's series of *Bread Works* (1979-1982), is a great example of the coupling of mosaic principles with everyday materials (figs. 7.5 & 7.6). David Mach's *Polaris* (1983), a replica of a nuclear submarine made of over six thousand individual car tyres (fig. 7.7), also exemplifies this turn to mosaical. However, an insight into the unfolding of mosaic principles in sculpture at this time is best offered by Tony Cragg, whose use of partible units developed in two distinct ways: as images and as structures.

Fig. 7.7. Mach. *Polaris* (1983), courtesy of the artist

Early images of Cragg's work indicate how mosaic principles offered him a methodological departure point for the creation of artworks, and informed his practice throughout his career. 'From the very start, he opts not for painting [...] nor for sculpture, but rather for something midway between the two' (Celant, 1996:12). A familiarity with Cragg's compositions from the early 1970s is crucial for understanding the trajectory of the mosaical in his oeuvre. Photographs of fragments of paper articulating a table and chairs (figs. 7.8 & 7.9) reveal how the tension between the furniture and the regularly shaped units, expressed in a manner reminiscent of crazy paving (opus palladianum), creates an acute sense of space. Material homogeneity, interchangeability and repetition of units offered Cragg a way of putting works together that evolved into more robust sculptures. This reveals how, in his practice, the structural, constructive line of mosaic evolved from fragments to structures. This is clearly seen, for example, in his series from the late 1990s, such as the stacks of glass bottles (fig. 7.10) and, more evidently, the dice sculptures (fig. 7.11).

Cragg's mappings of his own body with a sequence of stones (figs. 7.12 & 7.13) are indicative of how his compositions with fragments would develop into his colourful figurative wall pieces, such as *Self-Portrait on a Chair* (1980) (fig. 7.14), *Runner* (1985) (fig. 7.15) and the well-known *Britain Seen from the North* (1981) (fig. 2.26).

Figs. 7.8 & 7.9. Cragg. *Fragments on Table and Chairs*
and *Fragments on Table and Chair* (1971)

Figs. 7.10 & 7.11. Cragg. *Eroded Landscape* (1998) and *Secretions* (1999)

The development of mosaic principles is evident throughout Cragg's oeuvre, both the pictorial and constructive lines. Unlike the Minimalists, avoiding figuration was no longer an issue for sculptors of Cragg's generation and he could easily adopt the readymade as a repeated element in his work. Significantly, Cragg embraced the beauty

of discarded man-made materials such as plastic; as Celant puts it, he found 'his substance in the *low* part of the material universe, among discarded, castoff elements, the refuse of society' (ibid:13).

Figs. 7.12 & 7.13. Cragg. *Stone Circle* (1971) and *Stone Curve* (1972)

Original in Colour

Figs. 7.14 & 7.15. Cragg. *Self-Portrait on a chair* (1980) and *Runner* (1985)

It is interesting to note that the word *mosaic* is not widely used to analyse elements of Cragg's practice. The American critic Peter Schjeldahl seems to be the first one to do

so. In an essay titled 'Cragg's Big Bang' (1990), he uses the word mosaic thirteen times in the text. This evidences Schjeldahl's knowledge of the specificities of formal elements of mosaic composition and how mosaic lends itself to the making of images and the articulation of space. In his article, Schjeldahl defines Cragg's wall works as mosaics, based on their material homogeneity and opus sectile andamento, and not as relief sculptures as they do not intrude or disturb the wall. Schjeldahl (2003:90) notes that Cragg's mosaics are open and, through their interstices, reveal the undisturbed wall, like light reflecting of unrefracting glass.

Original in Colour

Figs. 7.16 & 7.17. Details of Cragg's *Britain Seen from the North* (1981) at Tate Modern, London (2000) and at Juan March Foundation, Madrid (2012)

As discussed previously, Cragg's plastic pieces are usually exhibited under the category of assemblage. However, they are in fact mosaic works made of accumulated material arranged formally in the manner of a picture or a structure, methodologically comparable to the *Watts Towers*.[147] Despite being called assemblages, they are easily recognised as mosaics due to their material homogeneity, seriality and the emphasis on unit interchangeability at the outset of composition. Regarding interchangeability, it is interesting to observe the details of two different installations of *Britain Seen from the North* (1981) and note how the units are clearly interchangeable (see figs. 7.16 & 7.17). In other words, the units do not occupy the exact same position, as the image is dictated by the overall shape, not the exact placements of units. Like in an *opus palladianum* mosaic, the meaning of the work remains unchanged. Cragg's works also

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[147] See chapter five.

exemplify well how the mosaical, as a method of producing works, lends itself easily to the recycling mode of recent art practices, characterised by the recovery and reconfiguration of independent units of discarded material. In this sense, mosaic offers an advantage in that it has the capacity to deal with discarded material, which is very relevant in relation to environmental issues that concern many contemporary artists.

Original in Colour

Fig. 7.18. Damasceno. *Solilóquio* (1995), courtesy of the artist

In the generation of artists of the 1980s, material modulation was also manifest in other regions of the globe. For example, in Brazil, sculptor José Damasceno, a member of the *Geração 80*, created sculptures and installations that, like Cragg's, are better understood under the mosaical paradigm. Like Cragg's, Damasceno's sculptures and installations are characterised by independent units of composition deployed in a serialised manner. His *Solilóquio* (1995) (fig. 7.18) seems to readdress Cragg's articulation of fragments on a table and chairs (figs. 7.8 & 7.9). In Damasceno's case, influences include Brazilian Modernist movements, Concretism and Neo-Concretism, and artists such as Aluísio Carvão, Hélio Oiticica and Lygia Clark, and this practice also has roots in the experiments of the Russian Avant-garde, the Bauhaus and *De Stijl*.[148]

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[148] Brazilian art and Modernism is beyond the scope of this thesis. The influences of Mondrian in Oiticica and generation of artists in Brazil is mapped out in: Ramírez (2007) *Hélio Oiticica: the body of color*.

Fig. 7.19. Damasceno. *Nota sobre uma Cena Acesa ou Dez Mil Lápis* (2000),
courtesy of the artist

Nota sobre uma Cena Acesa ou Dez Mil Lápis[149] (2000), made of over ten thousand pencils (fig. 7.19) is Damasceno's most memorable example of the unfolding of mosaic principles in Brazilian contemporary art. The pencils are used as tesserae to create the silhouette of a figure looking at a board or screen. The materials evoke a narrative related to memory, schooling and knowledge, and the modulation of the vast number of elongated units create a dynamic sense of spatial projection and movement, further suggesting a relationship with cinema and the moving image. The silhouette and board created as voids, or interstices between the noise, are reminiscent of *Consumption* (1982) by Gormley (fig. 7.5).

Damasceno's concerns with the screen, as a symbolic pictorial space, is revisited in *Monitor* (2012) a work made of over fifteen thousand individual crayons (fig. 7.20). It directly connects sculpture with the pictorial tradition and digital technologies; it combines an additive method of construction with additive synthesis of colour. The crayons' circular shape facing the viewer resembles the Sumerian terracotta cones (fig. 2.6) and the coloured potato starch grains of an enlarged autochrome plate (fig. 7.21) –also known as a mosaic screen plate– patented in 1903 by the Lumière brothers in France, 'the historical antecedent of the current pixel and sensors of digital cameras' (Torcellini, 2017:41). With *Monitor*, Damasceno merges the constructive and pictorial lines of mosaic, as discussed in part one, connecting his oeuvre with another aspect of the mosaical, digitality.

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[149] Note on a Lit Scene or Ten Thousand Pencils.

Fig. 7.20. Damasceno. *Monitor (Crayon)* (2012), courtesy of the artist
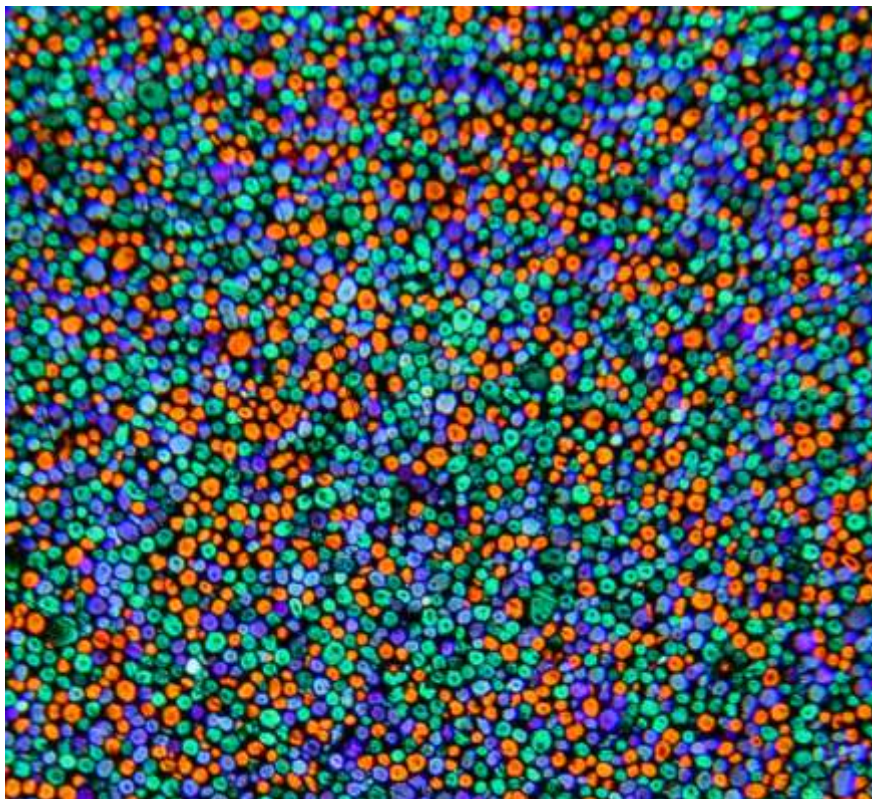
Fig. 7.21. *Enlarged Autochrome Plate* (2014) [c. 1903]

Mosaic and Digitality

As introduced in chapter three, mosaic principles unfold in twentieth-century digital technologies as a mode of visually structuring data. In defining parameters for a paradigmatic category of *digital aesthetics*, in *From Point to Pixel* (2017), Hoy discusses how structuring principles, based on discreteness of units, seriality and, most importantly, interchangeability, enabled computers to render data graphically. Thereby, Hoy recovers a notion of digitality that is directly connected to mosaic, which she acknowledges as 'a digital method [...] that precede[s] the invention of contemporary computer devices' (Hoy, 2017:11). In her analysis, she discusses Seurat, Klee and Vasarely in digital terms and builds her arguments by opposing digitality to analogicity, which parallels the *disegno* versus *colore* debate, as well as delineation versus modulation.[150] For Hoy (ibid:41), digital and analogue artefacts fall in to 'different epistemological frameworks.'

> [...] discretized[sic], particulate digital artefacts are structured according to different principles than analog artefacts, which are relatively smooth and continuous with no perfectly regularized[sic] divisions between parts, [...] discrete units as opposed to a field of continuous lines (ibid:11).

Hoy's notion of digitality overlaps with the notion of the mosaical, insofar as she implies that when mosaic principles are applied to picturing a marker of digitality is revealed; that the surface of the work is 'discretized[sic] and fractured, revealing an infrastructure of digital components' (ibid:7). Consequently, as an antecedent form of Pointillism, Hoy positions mosaic as presenting a digital or proto-digital condition. However, mosaic is not discussed in depth in Hoy's text. Rather, it is used in comparative accounts of works by Klee, Cézanne and Vasarely that support a development of this idea of digitality. Hoy begins formulating her arguments from the late 19th century but points out that her analysis can be traced back to pre-history. In effect, Hoy's research corroborates this thesis in evidencing how mosaic principles enabled digital technologies to harness the power of picturing with independent units of composition, thereby showing the intrinsic connection between mosaic and digital technologies. For Hoy, 'digital graphics are fundamentally constructivist in the sense that they build architectonic models from unitary, elemental units of form' (ibid:127).

Hoy's research shows close affinity with the conceptual framework developed by McLuhan in the 1960s and explored in the writings of Barilli. However, Hoy fails to

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[150] Examined in chapter three.

mention this connection, although it might have infiltrated her discourse through other sources. In the words of Barilli (1993:99),

> [t]he electronic image is formed by blips of linear abstraction, of elegant stylization[sic], of recourse to areas of intense chromatics. It is freed from the logic of industrial colors[sic], just as the Divisionists wanted to save themselves from the scourges of physical products by aiming at a fusion of tints obtained only on the surface of the retina. An image conceived in this way, thin and abstract in the true sense of the word, can easily be calculated and entrusted to computer programs.

In *Art and Illusion* (2000) [1960], Gombrich also discusses mosaics 'as precursors to modern digital codes' (Manovich, 1993:71). In this text, Gombrich notes that the opus regulatum or mosaic grid lends itself easily to computer binary language and the generation of images. The binary coding system of a graphic interface orders the surface of the screen by using pixels generated through additive synthesis.

> No medium illustrates the code character of this gradation [light and darkness] more clearly than that of the mosaic. Four graded tones of tesserae will suffice for the mosaicists of classical antiquity to suggest the basic relationships of form in space (Gombrich, 2000 [1960]:41).

Damasceno's sculpture *Monitor* (2012) (fig. 7.20) evidences this intrinsic relationship between mosaic and digitality by addressing an aesthetic that makes 'visible properties of digital discreteness' (Hoy, 2017:3) in a way that is comparable to Angela Bulloch's *Horizontal Technicolor* (2002) (fig. 7.22).

Original in Colour
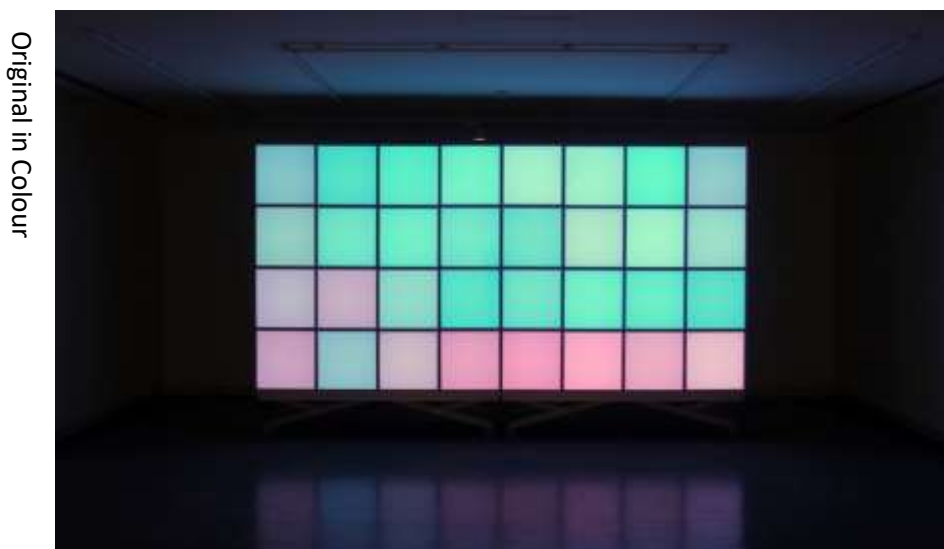
Fig. 7.22. Bulloch. *Horizontal Technicolor* (2002), courtesy of the artist and the Sharjah Art Museum, Sharjah, UAE

Bearing in mind the technicalities of production and presentation of both works, it is interesting to understand the role of unit interchangeability. In traditional mosaics and Damasceno's work, the interchangeability of units belongs to the production phase, at the outset, as the units are eventually fixed to their corresponding positions. However, in Bulloch's work, interchangeability is part of the presentation of the work and its algorithmic performance. The algorithm constantly adjusts and fixes the 'interchangeability of each unit of color' (ibid:2).

> Bulloch's work [...] renders its visual data as a formal array of discrete elements that correlate to a definite informatic quantity [...] a pixel location is commanded to render a given numerical value corresponding to a particular shade [...] color[sic] will be the same each time it appears (ibid).

The interchangeability of units is the *most valuable asset* of the electronic mosaic. Unit interchangeability is an old concept that was repackaged for technological usage to great effect in the continuous streaming of visualised data. In digital aesthetics, the mosaical comes to the fore when artists evidence 'the appearance of discrete units on the image surface' (Hoy, 2017:7), creating digital compositions 'as an aggregation of discrete, interchangeable units' (ibid:13), in opposition to works that look and feel naturalistic, like analogue images.

The meeting of digital and analogue offers an interesting point for consideration; 'when the computational ability of computers-as-machines meets or exceeds the maximum fineness of resolution registered by the human sensorium' (ibid:3) and digital artworks present a high level of 'analogue continuity' by obscuring the constituent parts of digitality on their surface, pretending to be what they are not structurally, they cease being mosaical. Thus, mosaic principles are supressed visually.

> The technologized[sic], digital world has been effectively naturalized[sic] [...] the digital resolution of the world picture is sufficiently naturalistic that its underlying structural principles become inconsequential and irrelevant (ibid:20).

In this way, the existence of digital works that do not evidence the constituent parts of 'digital processing on the pictorial surface' (ibid:4) provides a counterargument for the mosaical within digital aesthetics. However, for Hoy, there is 'an uncritical belief in the truth-value of information itself and the objectivity of information visualization[sic]' (ibid:193). Therefore, revealing the infrastructure of computational processes on the surface of the work, or its mosaicality, is an *aesthetic choice*. It is not simply a coincidence devoid of historical credibility.

Barilli (1993:98-99) considers the highly refined digital image a betrayal of its digitality; high-resolution betrays 'the specific nature of the electronic mosaic.' He compares the current level of image refinement to the fine mosaic works of the third and fourth centuries A.D. and champions an electronic image that allows a 'loose-knit context of low definition that constitutes its very soul to appear without adornment.' In this way, it allows the electronic image to find a visual correspondence with its antecedent forms, with less refined 'mosaics of antiquity and the Middle Ages' or Pointillism itself. Thereby, the less refined image is able to break away from the 'naturalising tendencies' that are a legacy of 'Modern perspectival illusionism.'

Despite the naturalising tendencies of digital technologies, mosaic as a mode of structuring the visual extends the Byzantine mode of representation and its fragmented, discretised iconicity. Mosaic principles, whether above or beneath human perceptual levels, remain present within computational processes, as revealed by my work *Macro News Room* (2016), a zoomed-in image of a HD television screen (fig. 7.23). This artwork unfolds visually mosaic principles buried beneath the surface of the monitor by highlighting the mosaical nature of the image, exemplifying how the concept of *enfolding-unfolding* aesthetics operates within my practice. According to Mirzoeff (1999:30), 'as a means of image creation, the pixelated screen is created of both electronic signals and empty space.' Hence, whenever artists engage in rematerializing the digital by giving emphasis to its deep structures, mosaic principles resurface, revealing a new mosaic materiality.
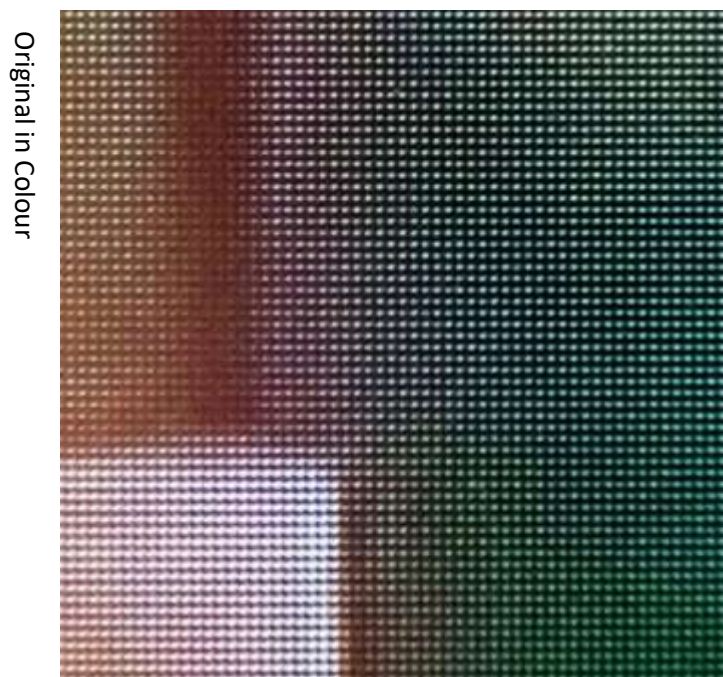
Original in Colour

Fig. 7.23. de Melo. *Macro News Room* (2016)

Fig. 7.24 & 7.25. Opie. *Verity Walking* (2010) and *Estate Agent I* (2015), courtesy of the artist

Artists such as Julian Opie, another figure associated with the 1980s generation, has also tapped into this new materiality and produced animated electronic mosaics in his walking sculptures made of LED lights (fig. 7.24). These electronic mosaics led Opie to a new series, works that were rendered traditionally, as mosaic (fig. 7.25). As Opie (2012: online) notes, '[w]hen you make a mosaic it'll last thousands of years, but when you make an LCD screen, it won't' and this understanding enables him to bring ephemerality to an otherwise fixed ancient technique, as an electronic mosaic can be easily switched off. It is within this new materiality that the locus of the contemporary debate around mosaic lies and, as a way of exploring mosaic, it finds resonance with numerous contemporary artists: painters, sculptors, photographers and street artists.

Mat Collishaw's mosaic series from the early 2000s adds an interesting dimension to the debate around contemporary use of mosaic strategies. In *Madonna* (2001), Collishaw articulated a connection between digital photography, monumental mosaic and instantaneous transmission of images online (fig. 7.26). To create the work, he appropriated an image of an Indian woman who was victim of a massive flood and immortalised her like a martyr.

During the inception of digital photography, it occurred to me that the pixelated format of the electronic image bore a strong resemblance to the ancient technique of forming images with mosaic tiles. The digital image required a meticulous analysis of its subject and was more analogous to the use of code in translating information than the subjective interpretation of a painter. Each patch of skin or braid of hair had a particular colour or tonal value that was recordable and empirically precise. I developed a computer program that scanned an image and determined the exact shade of grey on a scale of 1 to 100. The tones were painted onto ceramic tiles that were arranged in a way that was prescribed by computer, with no room for human intervention (Collishaw 2002 cited in Bloomsbury, 2015:36).

The monochromatic mosaics that emerge from this process bear a close resemblance to black-and-white Roman mosaic floors, which further acknowledges how mosaic principles lent itself to modern digital codes.

Fig. 7.26. Collishaw. *Madonna* (2001), courtesy of the artist

My interest in the connection between black-and-white mosaic floors and digital technologies began in 2011, when I developed an installation for the conclusion of my MA in Fine Art at the University for the Creative Arts in Canterbury. I generated two barcodes that articulated the exhibition space. This referenced Minimalism and questioned values in art through the notion of *transfunctionality* (fig. 7.27 to 7.29), a concept developed by French philosopher and sociologist Henri Lefebvre.

> Transfunctionality is whatever we cannot reply to by 'yes' or 'no'. Play is a momentary transfunctionality which consists of its own unfolding: ephemeral work of an individual or several individuals, successful or not, perfect or not, marvellous or not. (Lefebvre, 2002:128).

Fig. 7.27. de Melo. *As a Blind Man Looking for a Black Cat that Isn't There* (2011)

Fig. 7.28 & 7.29. de Melo. Detail of *As a Blind Man...* (wall and floor scans) (2011)

This installation was the first time I brought the idea of transfunctionality and the functional nature of codes together. The experience of the installation is sensuous, and its set up impinges on the viewer who has an embodied experienced of it. In addition, the viewer is also able to access the hidden messages in the codes that questions the value and nature of art itself.
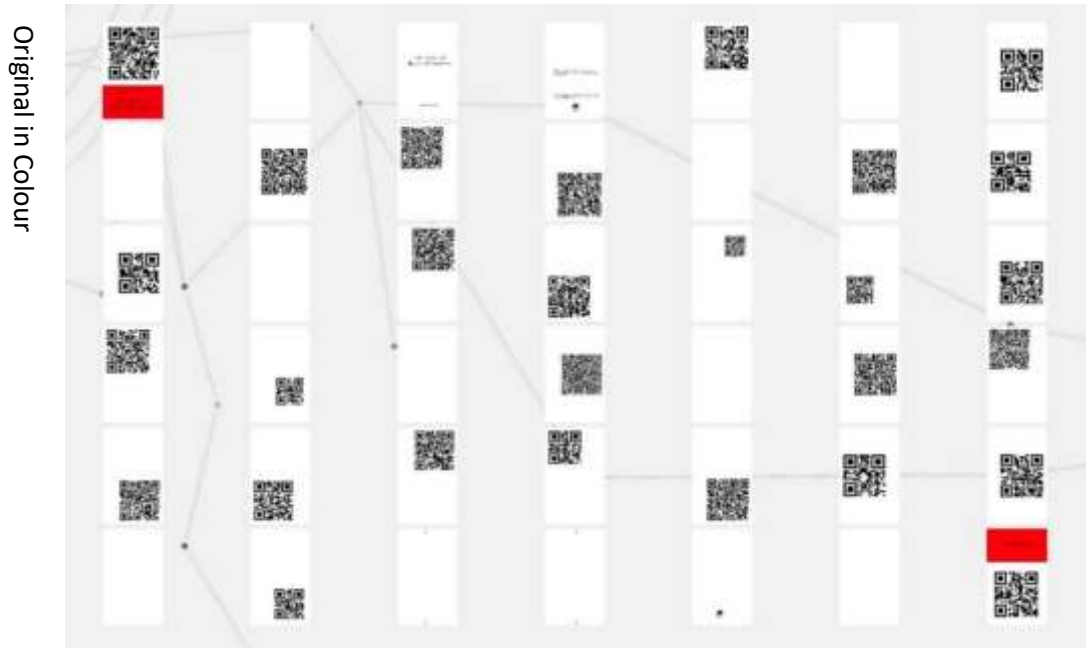
Fig. 7.30. de Melo. Full spread of *The Book of Quick Responses* (2015)

Fig. 7.31 & 7.32. de Melo. *Encoded Tesserae* (2017)

Furthering this line of investigation through Doctoral research, I created a *transmedial* work called *The Book of Quick Responses* (2015) based on an opus regulatum

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andamento. Through QR codes, the book reveals aspects of my research and fragmented passages of a personal narrative (fig. 7.30). To further emphasise the connection between mosaics, codes and printing processes, I revisited the original idea and added two extra QR codes to the book, made of ceramic tiles. I called this new version, which highlights mosaic principles through a heterogeneous material outcome *Encoded Tesserae* (2017) (figs. 7.31 & 7.32).

I continued to focus on the connection between mosaic principles and spatial articulation through digital technologies. For example, I created two further works for the Brewery Tap in 2016, one articulating the front window with black marble units (fig. 7.33) and another articulating the floor with vinyl tiles (fig. 7.34).

Fig. 7.33. de Melo. *Art Bars* (2016)

In *Art Bars* (2016), a barcode for the word *art* was generated online and converted into serialised units in space, connecting the traditional mosaic material, black marble, to digital technologies. The marble units were placed at an angle on the windowsill, referencing the setting of tesserae in Byzantine parietal mosaics. The piece also incorporated precisely calculated interstices; the exact placement of monochromatic units caused the work to function as a barcode in real terms, triggering the correct response in the software. Colour value is very important here, as light and shadow activate the barcode reader through its binary system of yes or no answers. This work deploys several aspects of mosaic making: the importance of spaces in-between units in encoding technologies, spatial articulation and serialised compositions. This work

can be described as intermedial and transfunctional, as well as an exercise in monumentality, a work that can be scaled up or down indefinitely.[151]

The idea of monumentality is taken up in *Encoding Carl* (2016), a magnification of a quick response code (QR) for the word *transfunctional* that pays homage to Carl Andre's metal carpets discussed in chapter six. This installation connects digitality with two other issues discussed previously; the phenomenological relationship between the viewer and the artwork and the constructive nature of the work. The meaning of the work can be activated by the action of the viewer walking on it and scanning the work with his or her own eyes. The work changes as one walks around on it, revealing different aspects of its arrangement. By referencing both the binary logic of black-and-white ancient mosaic floors and the 'clearly visible and simply ordered structure' (Bochner, 1995 [1968]:93) of Minimalist art through its constructive elements, the work expands its materiality and extrapolates Andre's literality by presenting the possibility of being scanned with a smartphone and revealing an extra layer of meaning.

Original in Colour

Fig. 7.34. de Melo. *Encoded Carl* (2016)

The series of works described here explore mosaic principles through spatial articulation and make connections with digital technologies that can be understood on many levels: through their relationship with architecture, issues of scale, phenomenological interaction, as well as ideas of encoding-decoding, textual-

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[151] The issue of mosaic and scale is examined in chapter two through the notion of point-horizon.

contextual and technical-technological. Each of these aspects is pertinent to my re-evaluation of the mosaical within contemporary fine art practices and each of these grid-based works evidences how the opus regulatum is an important feature of digitality.

Fig. 7.35. Rozin. *Trash Mirror* (2001), courtesy of the artist

Rejecting the grid structure of digital displays, Rozin, introduced in chapter three, produced *Trash Mirror* (2001) with five hundred discarded objects attached to wooden units in the manner of an *opus palladianum* (fig. 7.35). This interactive display operates with a video camera, motors, circuits and a computer equipped with a custom software. *Trash Mirror* is part of Rozin's mirror series, which uses tactile materials to create an image of viewers in real-time. In these works, fed information by the camera, opaque units create images on the screen, tilting the units to mimic the shape of the viewer in front of it. As the surface is not reflective, inclination is crucial to *reflect* the image back to the viewer as a simple digitised silhouette. The units are angled mechanically bouncing off the gallery light, producing the image through various degrees of light and dark.

> Unlike more traditional work, Rozin's work has no fixed subject. The image changes continuously in response to the movements of its audience; the subject is both the viewer and the interaction itself (Holmes, 2013:37).

Trash Mirror is a kinetic sculpture that merges the modularity of actual mosaic work with the interactive possibilities of digital technology by denying the grid as a structural principle and adopting an approach based on inclination, which Rozin calls 'angular

distortion.' In this, Rozin moves away from standardised pixel-based screens. He further evidences the mosaical within digital aesthetics by highlighting how the image is composed using discrete, serialised partible units. Another way of evidencing the presence of the mosaical involves showcasing the failure of the technology, the glitch, as explored below.

Glitch Art

The connection between mosaic principles and digital technologies is revealed through technological failures, such as glitches in the system. As Hoy (2017:3) explains, glitches allow the viewer to 'discern evidence of digital processing embedded in the picture's formal configuration.' In this way, glitches are traces of digital processes that can be observed on the image surface, such as in the work by the artist duo JODI (fig. 7.36). Hence, glitches reveal mosaic principles of image making applied technologically. For Marks, this connection is traceable back to Baghdad in the year 1000 when the pixels were first conceptualised through Islamic philosophy of atomism (Marks, 2010:189-218).
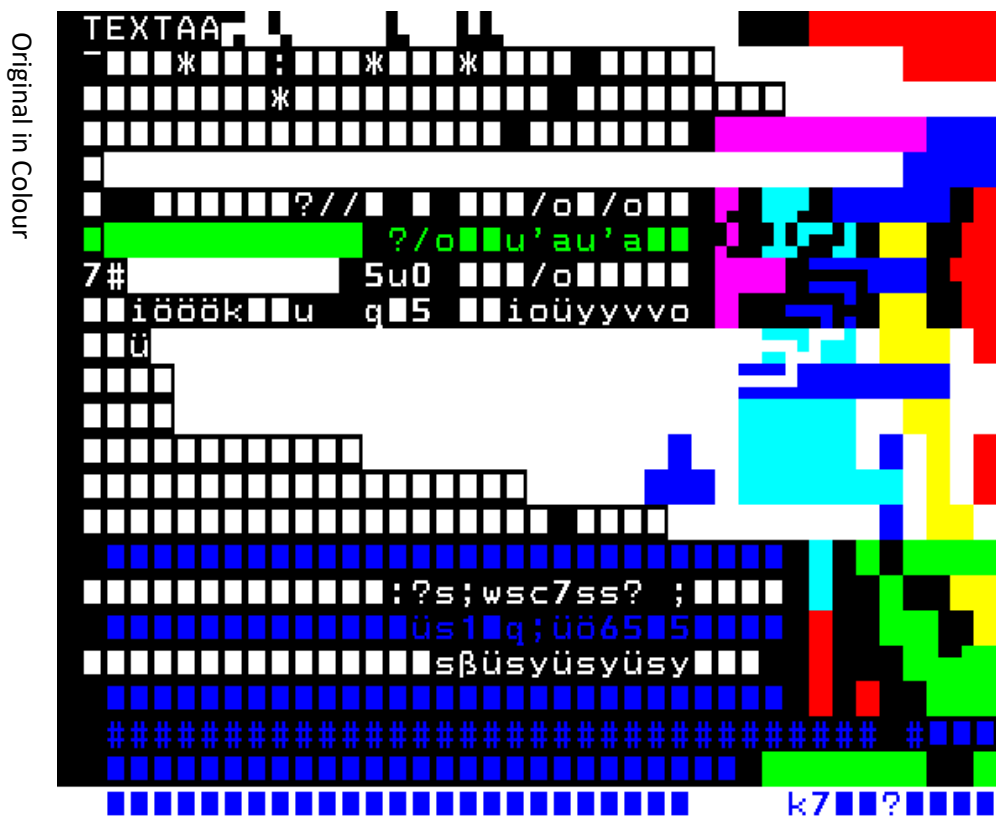
Fig. 7.36. JODI. Screen capture of *TEXT* [http://text.jodi.org] (2002), courtesy of the artists

Fig. 7.37. *Defaced figures with small cities in the mosaic at the Church of St. Stephen, Umm er-Rasas* (c. 587), As published in *Mosaics as History* by G. W. Bowersock, Belknap Press, 2006. Courtesy of the Studium Biblicum Franciscanum, Jerusalem

Artists who work with glitches have been compared with iconoclasts (fig. 7.37), in that their use of the glitch operates 'as a reaction to the iconophilia of the computer industry' (Hoy, 2017:190). However, Hoy conceptualises such use of the glitch 'in terms of interrogation of visuality or regimes of visibility [...] by foregrounding an aesthetics of digital structure' (ibid:86). For Contreras-Koterbay and Mirocha,

> [v]isual patterns, glitches and signal processing errors highlight the fundamental property of digital images which is usually hidden beneath the state of the visual content [...] A glitch offers a unique epistemic perspective. (Contreras-Koterbay & Mirocha, 2016:36-92).

In this way, work with glitches, as images that highlight 'a grammar of highly discrete modular and segmented plastic units' (Hoy, 2017:115), pertain to the mosaical, implementing an aesthetic choice that visually highlights structural elements. Since the naturalising of digital resolution, not all digital artefacts offer, via direct observation, a 'sensorially apprehensible' digital quality 'irrespective of the technical particularities used to achieve it' (ibid:55).

Highlighting digital discontinuity, American artist Shawn Smith produced a series of sculptures titled *Re-Things* emphasising pixilation and the occurrence of glitches in new sculptural objects. His triptych *Squish, Intersection and Spaghettification* (2012) and *Nesting Elk* (2016), made of serially combined plywood units, ink and acrylic paint (figs. 7.38 to 7.40), are good examples of how the digital condition informs and manifests a new mosaic materiality within contemporary sculptural practice.

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Fig. 7.38. Shawn Smith. *Nesting Elk* (2016), courtesy of the artist

Fig. 7.39. Shawn Smith. *Squish, Intersection and Spaghettification* (2012)

Fig. 7.40. Shawn Smith. Detail of *Squish* (2012), courtesy of the artist

My own approach to the glitch has an analytical vein. For example, the series *Interference* (2016), combines prints of digital photographs of the BBC 2 channel in glitch with ceramic and glass mosaic tiles, drawing attention to the structural nature of the digital transmission of images (figs. 7.41 to 7.44).
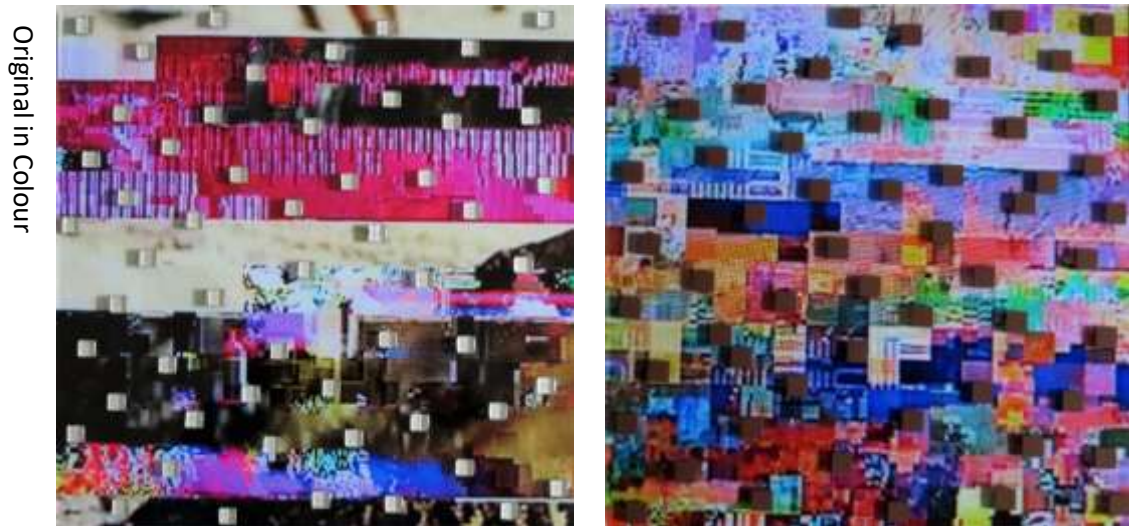
Figs. 7.41 & 7.42. de Melo. *Interference 7* and *Interference 3* (2016)

Fig. 7.43 & 7.44. de Melo. *Interference 1* and *Interference 9* (2016)

The photographs were mounted between aluminium and Perspex and the tiles were added on top, rematerializing digital light and emphasising the infrastructure of the digital screen. The glittering tiles both mimic the effect of TV statics and map out pixels. Thus, the nine separate images that comprise the *Interference* series (see fig. 3.5) boast an interesting phenomenological presence, generating a degree of

indeterminacy. The materiality of these images connects the actual with the virtual mosaic and takes the work beyond its initial function as an analytical tool for understanding the grid as a visual structure and 'the original form of computational graphic space' (Hoy, 2017:133). This series suggests that display monitors, glass technology and composition, and constructive processes have been influenced by mosaic making since antiquity through the notion of additive synthesis. The works belong to a material practice that conceptually and experientially reveals the mosaic-centred infrastructure of contemporary visual culture. In terms of contemporary fine art practice, my experimental system also points towards a new concern, the collapse of the expanded field of sculpture into a design practice, as highlighted below.

Three-dimensional Printing and Design

In a conference titled 'The Sculpture Question' held at the University for the Creative Arts in Canterbury in 2014, Penelope Curtis (Tate Britain director between 2010 and 2015) suggested that the expanded field of sculpture collapsed into design. It is a notion corroborated by recent books on sculpture and installation art, and by Michael Petry's book *The Art of Not Making* (2012). In his book, Petry explores the current relationship between artists and artisans in the production of new work through the standpoint of design. The works are presented in categories related to the materials employed in the making such as glass, metal, textiles and other materials, addressing the material turn of recent sculptural practice. Even though the topic of the collapse of the expanded field of sculpture is not central to the present research, it is a relevant consideration when it comes to the new materiality of mosaic in the digital visualisation of data.

The electronic mosaic image mediates design processes, even if the final product is not a mosaic per se. The visualisation of data through digital means is necessarily mosaical, regardless the high or low-resolution of monitor displays. As digitalisation samples everything and converts it into data, the visual output is, infrastructurally, a mosaic, even the visualisation of soundwaves on a computer screen. The mediation through digital technologies is standardised and in sculptural terms it produces a three-dimensional artefact based on a grid structure and composed of serialised, discretised and independent units. The sculptural series *Fleet on Foot* (2017) by Jonathan Wright created for the Folkestone Triennial 2017 (fig. 7.45) is a good example of how

sculptural practice is more and more reliant on digital processes and design. Wright's small gilded boats were displayed on poles along Tontine Street paying homage to local fishermen. The seven boats are reduced-size replicas of the last remaining boats in the area. Contemporary practitioners, such as Wright, seem to be willing to create works that address specific issues in the public arena by offering sculptural works that may contribute to the amelioration of social conditions through a design practice, instead of proposing challenging formal concepts in the public arena such as the controversial *Tilted Arc* (1981) by Richard Serra, which was infamously removed from the Foley Federal Plaza in New York in 1989 and is discussed in detail by Miwon Kwon in *One Place After Another* (2004). For Kwon, the new role of the artist as 'a cultural-artistic service provider rather than a producer of aesthetic objects' was triggered by annual and biennial art events that have now spread across the world (Kwon, 2004:4). It is a shift that moved sculptural practice away from an 'aesthetic value' towards a 'social value' through a design approach (ibid:110).

Original in Colour

Photo © Gary Browne

Fig. 7.45. Jonathan Wright. Detail of *Fleet on Foot* (2017), courtesy of the artist

Consequently, within this context of a design-led approach to cultural events such as the Folkestone Triennial, *Fleet on Foot* exists as a collection of sculptural objects among hundreds of other 3D-printed sculptures worldwide. Here, *Fleet on Foot* operates as an example of how mosaic principles have been manifesting through art and technology by a process of enfolding-unfolding aesthetics throughout the centuries, collapsing the *high* stratum of symbolic forms into the *low*. These works clearly support the premise that the contemporary *voxel* is a standardised and tamed version of the ancient *tessera*.

IMAGE UNAVAILABLE
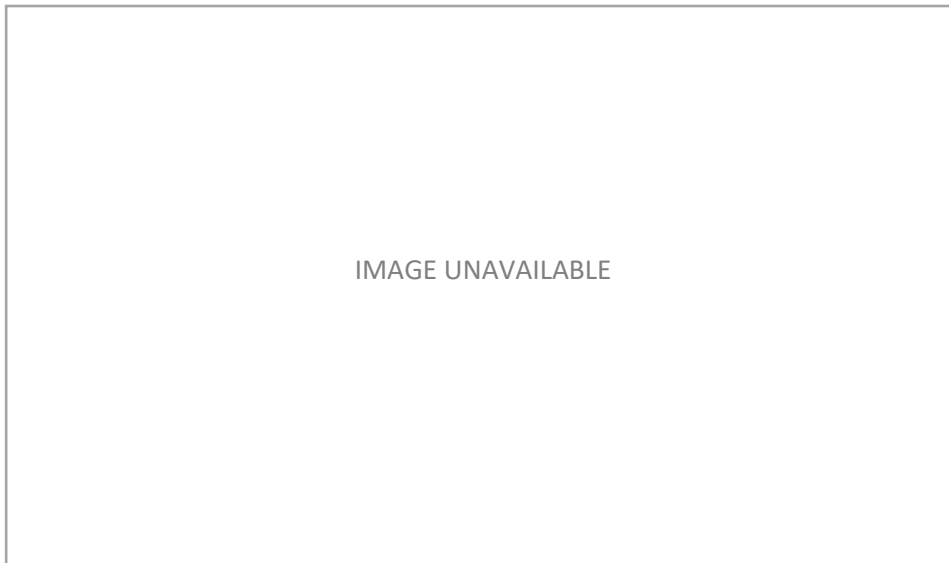
Fig. 7.46. Bernd and Hilla Becher. *Framework Houses* (1959-1973)

The notion of typology in art can easily be confounded with the interpretative framework put forward in this study, which is based on mosaic principles. Consequently, the subject of typology is given some attention here as a way of setting out some counterpoints and drawing out differences between the two. Typology is the study of types applied to the classification of things according to specific characteristic or parameters. It is generally utilised in anthropology and archaeology as well as linguistics and psychology. In art, it is best exemplified by the photographic work of the duo Bernd and Hilla Becher (fig. 7.46), which, in cataloguing and displaying images by type, provides a straightforward reading of typology. However, when a typology set up through a mosaic method such as photomosaic the issue is more complex, such as in the work *The Face of Suffrage* (2018) by Helen Marshall installed on the concourse of Birmingham New Street Station in October 2018 (figs. 7.47 & 7.48).

Marshall's work is rendered as a non-slip vinyl surface and brings together over 3,700 images of women, past and present, to creating an overall portrait of Hilda Burkitt, an important figure of the Suffrage movement in the West Midlands. With this work, Marshall's typology is rendered as a mosaic, offering a clear reading of the structuring principle employed. In photographic displays, identifying the method involved is often straight forward. However, in sculptural practice it is not so clear cut, as some of Rachel Whiteread's works demonstrate.

Fig. 7.47. Marshall. *The Face of Suffrage* (2018), courtesy of the artist

Fig. 7.48. Marshall. Detail of *The Face of Suffrage* (2018), courtesy of the artist

Whiteread's *Line Up* (2007-2008), displaying eighteen unique casts of the space within individual toilet paper rolls, is a playful typology that relates to the artist's interest in making invisible areas visible (fig. 7.49). Nonetheless, it could be argued that these individual units perform like tesserae forming an overall composition, due to their seriality, homogeneity of materials, shape and colour. However, this work is neatly exhibited as a study of types, providing a clear reading, while the reading of *Untitled (One Hundred Spaces)* (1995) presents more challenges (fig. 7.50). As the title suggests, *One Hundred Spaces* is comprised of one hundred units; resin casts of the space under one hundred different chairs. Like *Line Up*, this is also a typology of spaces. However, it is exhibited as a single overall composition that restages Judd's *100 untitled works in mill aluminium* (1982-1986) installed in Marfa (fig. 6.6). Judd's work

articulates space in a way that is influenced by the logic of the spatial mosaic icon, as explored in chapters five and six. Despite being a typology in a general sense, Whiteread's *One Hundred Spaces* sets up a network of relationships and in doing so goes beyond the simple display of items. This work could also be reinterpreted along the lines of the framework proposed by this thesis; it is reliant on unit seriality, homogeneity of materials, shape, use of colour and, most importantly, spatial articulation, along the lines discussed in chapter six in the analysis of works by Judd and Andre.

Fig. 7.49. Whiteread, *Line Up* (2007-2008), courtesy of the artist

Fig. 7.50. Whiteread, *Untitled (One Hundred Spaces)* (1995), courtesy of the artist

The display of units in a gallery in a manner that indicates a typological concern should not necessarily be interpreted within the constraints of a mosaic-based framework. For

example, if, as illustrated by my work *Infectious Narratives* (2013-2014) (fig. 7.51), it maintains a clear a focus on the unique characteristics of each unit then it must be considered to sit beyond the mosaical framework. Even if such work uses materials that are mosaic related, this difference should be born in mind. This is evident, for example, in the way in which *Infectious Narratives* involves placement in sequencing trays and the overall display strategy conforms with the language of typology.
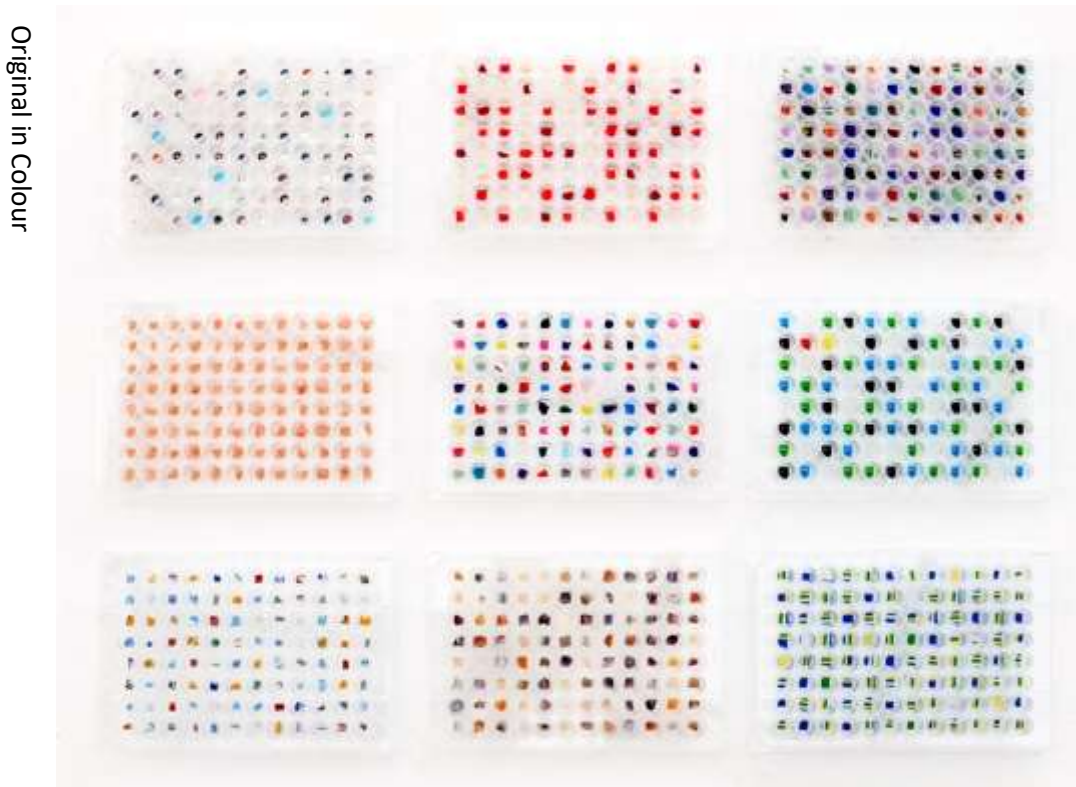
Fig. 7.51. de Melo. Detail of *Infectious Narratives* (2013-2014)

In combination with ideas developed in part two, this chapter has undertaken a more detailed examination of the way in which assemblages are necessarily mosaical and overlap with the category proposed by Seitz in the 1960s. In this, my practice has served as a departure point for the discussion both conceptually and in experiential terms by exposing the mosaical to viewers in several countries such as Israel, Brazil and the UK. This chapter has furthered the reading of mosaic, or assemblage, characterised by serialised homogenous compositional units, material homogeneity and a considerable level of unit interchangeability and seriality; strategies that clearly engender distinctions that find their root in the experiments with faktura of the historical avant-gardes, during a climate of experimentation in art and science that informed technology. Mosaic

principles were developed through *techne* into digital technologies for the visualisation of data, that went through a high level of standardisation based on the grid and discretised interchangeable units for use in graphic interfaces. Through *techne*, the printed voxel is proposed here as a contemporary version of the ancient tessera, both a building block and a pictorial element. The material practice examined here, through the works of the 1980s generation, has also revealed aspects and influences of the digital. Furthermore, this chapter evidenced how the digital realm is mosaical at an infrastructural level, whether above or beneath the human perceptual threshold. This is relevant to debates around digital aesthetics, particularly those concerned with artworks that visually highlight the infrastructure of computational processes, a choice that confronts the naturalisation of the digital image influenced by the Renaissance mode of representation. Therefore, when artists engage in the rematerialisation of the digital, they inevitably redeploy mosaic methods of image making in a more traditional sense evidencing the Byzantine mode of representation and its fragmented iconicity, a structuring mode that, as this thesis shows, prevails in contemporary visual culture. Moreover, this chapter has also stressed that works of a typological nature are not necessarily mosaical as they do not set off complex networks of relationships beyond the simple display of items.

Chapter Eight: Articulating the Brewery Tap
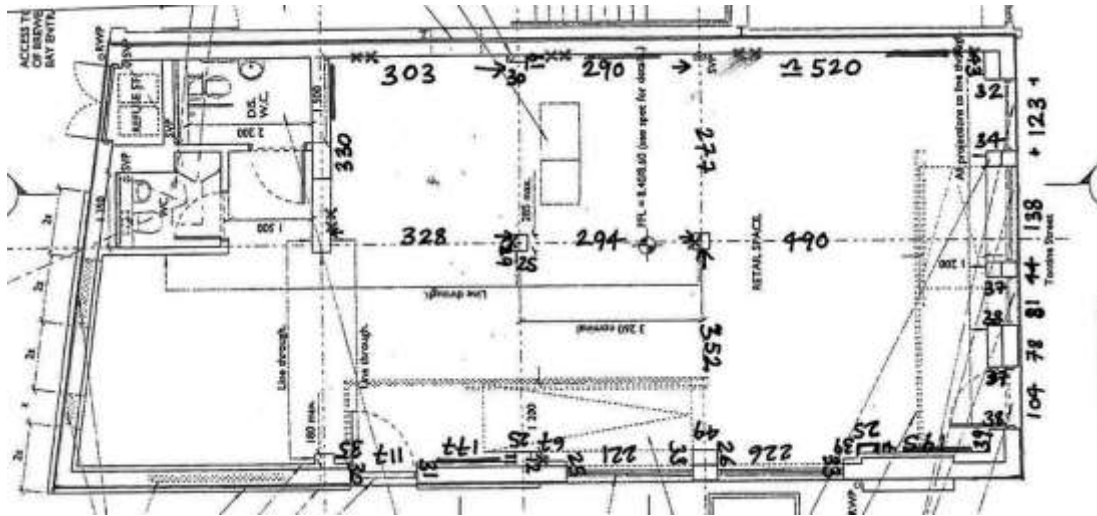
Fig. 8.1. *Floor Plan of the Brewery Tap* (date unknown)

The present chapter presents a reflection on my practice, specifically as it developed through my articulation of the Brewery Tap, which I used as a site for experimentation, production and exhibition of artworks. The Brewery Tap also gave me an opportunity to test out and develop the concept of experimental systems, as introduced in chapter one and further examined in the final section of the present chapter. As explained in the contextual overview section of this thesis, my artistic output is located within the recent 'material turn,' created through the repetition of 'material activity' and influenced by Deleuzian ideas. This practice manifests through assemblages of found materials and objects, sometimes altered and sometimes as they are, or a combination of both. In addition, my installation practice is also characterised by the ephemeral quality of the works, for which Miwon Kwon's analysis offers a particularly pertinent way in. In *One Place After Another* (2004), Kwon maps out the development of installation practices showing how installations have become increasingly transient over recent decades. She sets this against the tendency of installations of the 1960s and 1970s to be fixed to a specific place or context, or to exercise a *site-specificity*. According to Kwon, installation practice is now characterised by transience; artists are globally mobile, moving between cities and events, and assuming a role of cultural producers (Kwon, 2004:55). This is reflected in my own exhibiting history, which has included events in several countries and demonstrates a high level of geographic mobility. Therefore, the practice-based content generated through my experimental system constrained by mosaic principles

is central to the resolution of my thesis. This practice-based dimension of the research has been a means of testing and playing out some of the ideas as they have concurrently been tested and developed within the written counterpart. The works produced through this process contribute to this research experientially, rather than simply historically; they have enabled me to explore how the mosaical performs an important role in contemporary fine art. Even though the works are connected to the Brewery Tap, the ideas developed through these pieces go beyond those site-specific connections and can be reapplied elsewhere; they manifest the sense of transience discussed by Kwon. This thesis asserts that continued iteration through a material practice is essential to the development of new theoretical concepts, not only new material circumstances and, in my case, the more I make the more I think.

The Brewery Tap as a Site for Experimentation

I claim that my practice is rhizomatic and I use whatever material I can find to produce works in a non-hierarchical manner. This raises questions regarding the role that this type of *all-over-the-place* strategy, and it's implicit rhizomatic approach, might play a study of mosaic principles. The study is in a position to answer such questions by pointing to the way in which mosaic principles are derived from an additive method of construction and composition and, as the historical and methodological part of my thesis reveals, mosaic offers an approach to making that can be ordered and controlled, enabling experiments to be more analytical and displayed in a clear manner. In other words, I use a mosaic methodology to work on composition and constructions that deal with aspects of colour and their material manifestation, and by modulating independent units in space, I also create experiences that evidence the contribution of mosaic to newer technologies, such as QR codes and the digital data visualisation, as examined in chapter seven. In this way, my practice expands the notion of mosaic beyond medium specificity and test the limits of its expressive potential by deploying independent units of colour, and articulating the gallery spatially. The formal mosaic elements, explored in chapter two, serve as a departure point that combines with gridding, as an underlying principle that connects ancient, modern and contemporary practices.[152] In a way, I let myself be guided by what Marks describes as *a geometric kunstwollen*. For Marks (2000:27), *kunstwollen* is a 'quaint notion [that] runs contrary to the contemporary art-

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[152] The grid as a visual structure is discussed in chapter three.

historical emphasis on how the social and material milieu define and constrain an artist's practice.' It is a notion that is gaining currency, again triggered by the recent material turn in contemporary fine art practice, and has clear connections with the kind of material experimentation proposed by Rheinberger and discussed in Schwab et al (2013).

The Brewery Tap (fig. 8.1) at number 53 Tontine Street in Folkestone functioned as a public house from 1870 until it was converted into a project space and gallery in 2004. In this guise, it currently provides a unique space that is used by the University for the Creative Arts. The space comprises the ground floor and the basement of a Victorian building that dates to the later part of the 19th century. It has three doors at the front of the building and, since the conversion, it has three glass side doors that lead to a memorial garden (a bombsite of the First World War). As the Brewery Tap was available to me as a space for experimentation, production and exhibition during the research process, I set about finding ways to articulate it through my mosaical practice.

Constrained by mosaic principles, I began by using building blocks and other found units to start a series of works that considered colour as a key element in spatial articulation. I chose particular areas of the Brewery Tap to produce my first research pieces: a corner, a wall with light switches, a space between columns and the basement of the building. Referencing the tessera as both building block in a structural sense and a pictorial element, units of colour were the starting point. They were modulated through strength and tension, taking into consideration the force of gravity, and the properties of light.

It is worth noting here that my approach is very sensorial. Even though I am working with a methodology that can be understood as organisational, I feel the space before commencing production. I enter a space and allow myself to capture its energy. I spend time walking around, looking, sitting down, lying on the floor and, essentially, feeling what the space allows me to feel. Once I understand the area sensorially, I begin to devise strategies to enhance certain aspects of it or control the flow of energy, or interrupt it. In my installational practice, I do not approach a space with a predetermined plan or fixed idea. Rather, I develop a *tool-box* of ideas that can be deployed to create new work based on the sensorial information of any particular space. Once deployed, these ideas can be expanded upon, allowing for chance to play a part and a controlled level of improvisation. This hinges on what I describe as 'acquired intuition,' to borrow Rheinberger's words (cited in Schwab, 2013:129).

Soft Corner (2015), the first work produced in response to the Brewery Tap, is a floor-wall-corner arrangement made of two hundred and fifty-two individual mass-produced sponges, measuring 10 x 180 x 80 cm in total (fig. 1.1 & 8.2). It is a work that references floor mosaic and expands its traditional materialisation by connecting it to the sculptural tradition of the corner articulation, started by Joseph Beuys and his triangular corner pieces. Colour and texture contribute to the sensation of softness felt when apprehending *Soft Corner*. The work is not a typology of sponges or a mere display of units; rather, it articulates a specific area of the Brewery Tap by relating to the radiator against the wall. The work is a careful modulation of sponges: vertical, horizontal, back-to-front and upside-down, which breaks with any sense of flatness and renders the work more than just a collection of sponges on the floor. The dark green areas of the sponges also resemble grout lines, or interstices, dividing muted colours, which provides further evidence of the mosaic nature of its conception. The work emphasises this specific corner of the gallery by picking up the rhythm of the radiator lines, further imbuing it with site-specific properties. In this way, *Soft Corner* provides a memorable or even sublime experience, regardless of the everyday nature of the material and connotations of domesticity and cleanliness. Importantly, each of these points that can be expanded on in an analysis of the work, and thereby provide further meaningful conceptual connections beyond its formal, site-responsive, arrangement.

Fig. 8.2. de Melo. *Soft Corner* (2015)

Control Panel (2015) was the second piece made in response to the Brewery Tap. It was created with a series of found materials, modulated in a *regulatum* andamento,

and addresses the specificities of the fittings on one of the walls of the Brewery Tap (fig. 8.3). In essence, this work plays with the formal qualities of the site by appropriating the wall fittings and incorporating them into the work itself. These site-specific aspects are articulated through the layers of independent units, where colour plays an interesting role and the viewer is confounded by the usefulness and uselessness of the overall panel. Alongside responding to a specific area of the Brewery Tap, this work is also concerned with mass-production, commodification and the environmental impact of plastic, which it conscientiously deploys. This wall was chosen in particular because of its light switches, as a reference to McLuhan's notions of mosaic *i.e.* the return of mosaic principles in the Electronic era through the control and manipulation of electricity and transfer of data. Furthermore, the use of remote control casings as compositional units alludes to the tactile *mosaic space* of the television, discussed by McLuhan in *Understanding Media* (1964).
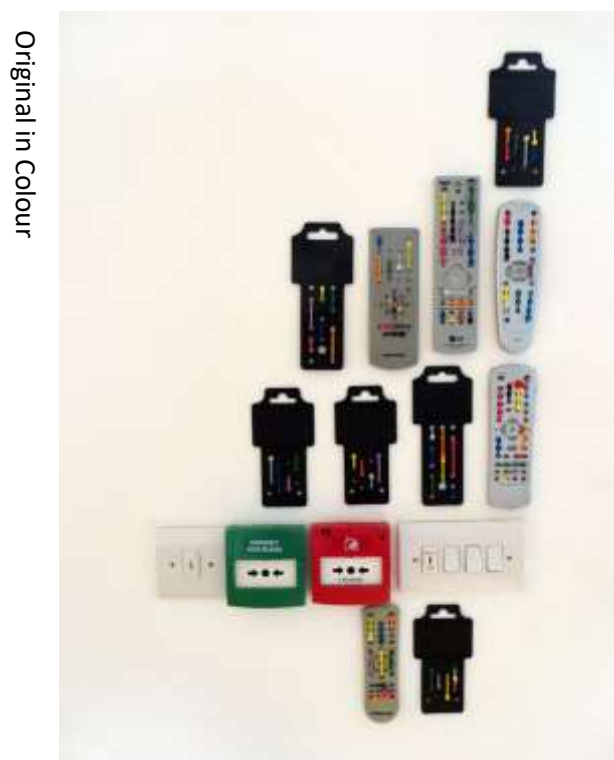
Fig. 8.3. de Melo. *Control Panel* (2015)

The self-contained units of *Control Panel* allow colours to interact with each other, revealing, for example, specific aspects of the cable binders in relation to their background colours; it is possible to observe that the dark blue binders are more visible against grey, and yellow stands out against black. Purple tends to disappear against grey the further one goes, and is more prominent against black. The pink units seem

not altered against black or grey, which is like the perception of orange, seemingly not altered in comparison. In this way, *Control Panel* is a playful way of testing how perception of colours relates directly to the way they are juxtaposed, which is something of an homage to Albers although it is not as formal as the exercises presented in his book *Interaction of Color* (1963). *Control Panel* proposes a subjective, experiential way of testing the manifestation of colour, unlike scientific methods of measuring the precise wave-lengths of each colour separately. Referencing Albers, Judd (1993:271) stated that 'color[sic] is knowledge' and as knowledge it 'is very durable.'

Original in Colour

Fig. 8.4. de Melo. *Cuboid Net* (2015)

Cuboid Net (2015) is another work developed at the Brewery Tap. It was created with one hundred and ninety-six coloured woodblocks, seven hundred and eight-four eye-screws, one hundred metres of nylon thread and more than eight hundred individual rubber bands. Overall, it measures 360 x 700 x 325 cm. Responding to the dimensions of the gallery and spatial constraints, this work was constructed as a transversal net (fig. 8.4), instead of as a wall-like structure blocking a section of the gallery, which was the initial plan. My sensorial engagement with the building helped me to realise that the architecture of the Brewery Tap would not work well with this initial idea, and I had to improvise. As a result, *Cuboid Net* deals with material modulation, colour interaction and site-specificity and, in the context of Folkestone as a coastal town, fishing nets from

the harbour provided me with a visual cue, a solution for the constraints on this installation.

Cuboid Net has a direct relationship with mosaic making in its use of independent blocks of colour that are put together in a serialised manner to form a consistent whole. In line with this, the placement of independent, separate units in space was based on a grid-like formation and the repetition of units of colours. In this work, the units were place at a distance from the wall. Thus, the mosaic lost its base and articulated the space near the main entrance door of the building. This spatial placement of units emphasised the interstices in-between them (fig. 8.5) and they formed a *constellation* of cuboids, which, in allowing force of gravity to pull at the units, felt like a visualisation of Albert Einstein's fabric for the space-time theory.

Original in Colour

Fig. 8.5. de Melo. Detail of *Cuboid Net* (2015)

The issue of gravity pulling the net down led to use of a stronger bonding agent, in this case thick nylon thread, instead of just the rubber bands. The gravity-pull became much stronger on the higher points of the work, and the point closest to the ceiling suffered the most. The rubber bands alone did not withstand the force of gravity as they allowed the work to be pulled down too drastically, creating a belly-like effect in the middle. Had this work been set up as a wall with fourteen points of contact on each of the four sides, as originally intended, the force of gravity would have been distributed evenly and there would have been no need for reinforcements. So, among other issues, this work deals with a universal balance of forces: movement, equilibrium, spaces in-between and

spatial articulation. In its site-specificity, *Cuboid Net* directed the flow of visitors in the gallery in a very particular way, and provided viewers with a phenomenological experience that goes beyond the simple visual effect of the work; some viewers took the liberty of lying down on the floor to enjoy moments underneath the colourful cuboids. Viewers were able to see through the work in an unexpected way, pushing further the sensation of interacting with a work created through mosaic principles of composition. Compared with the straightforward nature of *Soft Corner*, installed on the opposite side of the gallery, *Cuboid Net* has a far more interesting relationship with the architecture of the Brewery Tap and stretches the notion of mosaic further. Additionally, *Cuboid Net* has an instrument-like quality; gravity sets up a kind of tension that allows the blocks and nylon threads to be played. In this way the work generates its own sound, which gives it a quality beyond the visual, making room for an interplay of senses and inviting further investigation. The process of making this work triggered further thoughts in relation to mosaic and Post-Minimalist work, thereby contributing to the advancement of my research.

Testing the works described above through a public exhibition offered an important opportunity to gather information from viewers in general, and more specifically from those with a particular interest in art. This yielded some interesting results. For example, *Cuboid Net* triggered anger in one of the visitors who could not understand why such a work was being exhibited there. It was not a painting or a standard sculpture. After reading the information provided, this viewer became even more upset and declared, 'I can't believe that, nowadays, academic institutions are giving PhDs to artists! I don't get this work and it is surely too subjective!' My offer to explain met the response 'go ahead, convince me.' I described how the work was inspired by the ancient tradition of mosaic making, which I was connecting to installation art and spatial articulation. I also mentioned the issue of colour interaction and how the units in space were also testing the force of gravity in the system. Eventually the viewer said 'ah, it is interesting. I get it now. It is not as subjective as I thought' and left the premises with a smile on their face.

This interaction with the visitor suggests that research at any level requires a good amount of explanation and, in the arts, this becomes even more important as there is a general tendency to think of art as a field that is too subjective for rigorous research, restricted to responses of liking and disliking rather than open to analysis. Exposing the work and testing it experientially is essential to the outcome of the research. As Rheinberger points out, 'science takes place at the level of language' (cited in Schwab, 2013:200) and, to a certain extent, artistic research also requires a representational

space where experiments are explained through language. Furthermore, according to Rheinberger, while 'knowledge claims' are made differently across disparate disciplines, those claims are no less valid when emanating from the experience of art.

> Knowledge is being produced in music and literature and in other areas of culture, but the way it articulates itself is qualitatively different from the way knowledge claims are articulated in the sciences (Rheinberger cited in Schwab, 2013:207).

Original in Colour

Fig. 8.6. de Melo. *Foundations* (2015)

Foundations (2015) was created and exhibited at the Brewery Tap, alongside the aforementioned works. It was comprised of seven hundred and fifty-nine rubber bands, forty-six nails, one hook, and a diverse range of found objects, such as books, magazines, plastic pieces, bricks and wood. It articulated the staircase leading to the basement of the building and was approximately 430 x 270 x 300 cm overall (fig. 8.6). As the Brewery Tap served as an experimental space, I created this work on the spur of the moment. I was trying to expand an idea that I began to develop at the end of my MA in Sculpture at UCA Canterbury in 2011. When I discovered the basement of the building, I found an opportunity to articulate this idea within the work itself. I kept the passage door open and used the access stairs to display a variety of materials modulated in such a way that they created a conceptual narrative concerning repetition, pattern making, design, art and language, and connecting with many instances of the

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mosaical. The viewers were not allowed into the basement, but the open door allowed them to look down on the work and the partially revealed basement (fig. 8.7).

Even though *Foundations* was constructed through partible units, the strongest relationship with my research is its metaphorical content. To state that it emphasises the unearthing of layers of cultural information needed to contextualise my research, might seem a simplistic reading. However, there are other layers to the work that are pertinent. For example, in raising questions regarding the articulation of spatial relationships, it opened up discussion and analysis around elements such as the fragmentation of the lines and the shapes created by them, the relationship between the work and the wall, the partial reveal of the basement through the door opening and the connection between the gallery and the basement, which is usually hidden. The work isolated and condensed that particular feature of the gallery, suggesting the idea of containers within a container of materials, experiences and knowledge, both revealing and concealing meaning. Mainly, this work deals with spatial articulation through fragmented coloured lines and an assemblage of found independent units modulated spatially. The work references spatial drawing, connecting it to a tradition with roots in Tatlin's *Corner Counter-Relief* (1914) (fig. 5.5).

Original in Colour

Fig. 8.7. de Melo. Detail of *Foundations* (2015)

In *Foundations* the lines are fragmented, alluding to the discontinuity of the modulated line in mosaic making. When seen from afar, *Foundations* differs greatly from when it is seen up close. Philosophically, it relates to questions regarding the individuality of

units, structure and overall dynamics. The separate units that comprise this work come together to create a consistent whole, which, in its spatial articulation, connects to the logic of the icon discussed in chapter five. *Foundations* is a true site-specific work in that it cannot be relocated without losing its meaning and specific phenomenology. Nonetheless, the work provided me with ideas that can be explored elsewhere.

In June 2015, I created a second installation for the Brewery Tap, which encompassed the entire gallery. *Light Modulating Units* (2015) dealt with the sunlight around the summer solstice and was made of mirrors, Perspex, MDF and a plastic ball (fig. 8.8 to 8.13). It measured approximately 180 x 500 x 20 cm. The work relied on natural light to be activated; it articulated the Brewery Tap through its glass doors and windows and the alignment of the buildings with the sun at and around the summer solstice. The units were placed on the floor to reflect light on to the walls and ceiling of the gallery. The inclination of the pieces of glass modulated the projections or light reflections and the result on the walls and ceiling was something comparable to low-res, 8-bits, computer graphics (fig. 8.9). These projections could also be understood as icons. They moved according to the position of the sun as it passed overhead. Once at the meridian (summer solstice), the last projection of light hit a translucent plastic ball that was placed on the radiator of the opposite wall. When the sunlight hit the ball, it reflected the sunrays in the shape of a crown on to the wall, marking the meridian at the summer solstice (fig. 8.10).

Original in Colour
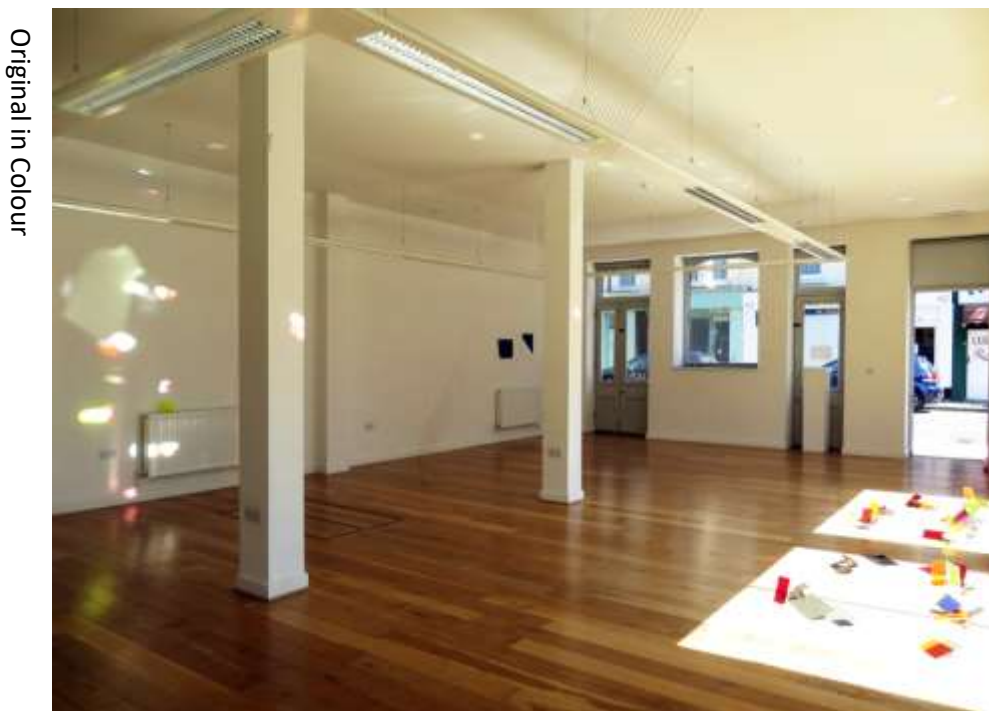
Fig. 8.8. de Melo. *Light Modulating Units* (2015)

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Through the reflection of light on to walls and ceiling, *Light Modulating Units* created abstract icon-like images that resembled early computer graphics or even smartphone app icons. In this way, this work tested the mosaical mainly through inclination of the units. It also took mosaic qualities such as repetition, spaces in-between and geometry into consideration, as well as the creation of icons through aniconic shapes. In a sense, these icons restaged Malevich's *Black Square* (1915) in its installation among several other Suprematist paintings. For Potts (2001:19),

> When Malevich created an installation of his recent abstract work at the 'Last Futurist Exhibition 0.10' in Petrograd in 1915 [fig. 4.13], the result was a Malevich world that surrounded the visitor and disturbed a conventional contemplative mode of viewing in which one faced, at a discrete distance, a single work one could easily encompass within one's gaze.

Through *Light Modulating Units*, I was able to understand how the mosaical encompasses discussions about early computer graphics, abstraction as aniconic entity and the relationship between such entities and Byzantine icons, iconic value and the further development of aniconism in Islamic art. It is a work that merges many traditions and its analysis can lead to a detail discussion of spirituality in art, as well as the role of mosaic within the visualisation of data.

Original in Colour

Fig. 8.9. de Melo. Detail of *Light Modulating Units* (2015)
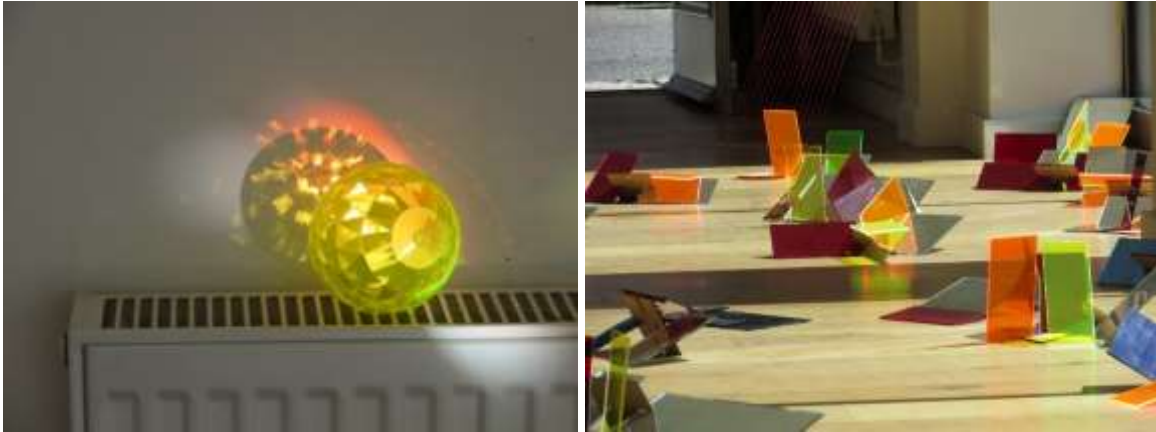
Fig. 8.10 & 8.11. de Melo. Details of *Light Modulating Units* (2015)
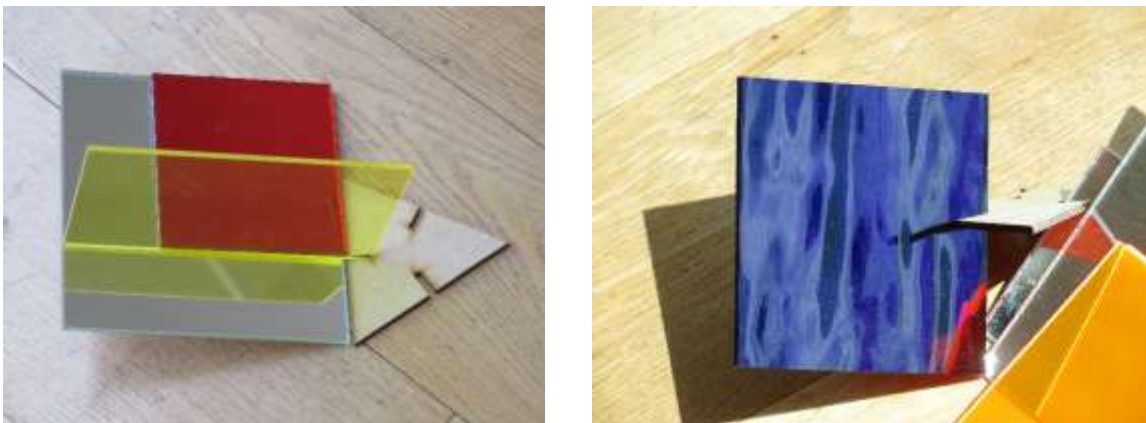
Figs. 8.12 & 8.13. de Melo. Details of *Light Modulating Units* (2015)

Another interesting point is the fact that this work presented the viewer with a double materiality: firstly, the actual units on the floor with their compositional mosaic-like arrangement; and secondly, the manifestation of light on the walls and ceiling. Here, inclination was not used to resolve the composition but to connect shafts of light with the space beyond the surface. The regular mirrors used in the work (fig. 8.12) projected light directly on to the walls and ceiling while the corrugated mirrors dispersed light, instead of focusing it. The corrugation in the mirrors evidenced the extra inclination inbuilt in the glass itself (fig. 8.13), which is a direct legacy of mosaic making in the contemporary production of glass. This attention to materiality and inclination created an immersive experience, a work that was not contained within a single plane. This goes far beyond a simple exercise in optical lift-off and creates a new experiential realm that extends the material and *spiritual* nature of Byzantine mosaic by rearticulating the

spatial icon through the separation of the planes. In this sense, the viewer is not simply placed within the spatial configuration of the work but becomes part of that arrangement. For example, at certain moments, the reflections or icons are projected on to the viewers themselves. As a whole, this work juxtaposes Byzantine references and low-tech computer graphics; it connects mosaic historicity with collective experience and transcendence and, like ancient mosaic, brings art and architecture together to offer a collective or communal, or even ceremonial, experience. In addition, the passage of time altered the work experientially as it changed according to the time of the day, revolving around the modulation of direct sun light. From this angle, it was notable that the reactions of viewers at the solstice, when the light hit the ball, ranged from the contemplative to the euphoric.

The glass units in *Light Modulating Units* can be arranged in an expanded version of the work, taking shape in a large grid formation much like the new solar power plants found in Spain, China and other countries, where mosaic principles have been applied to solar power technologies. In Spain, the application of unit *inclination* to the positioning of mirrors is crucial for directing solar rays to the exact position on the top of the solar power towers (fig. 8.14), and in China, mosaic principles were used in the design of a new solar power plant in the shape of a panda, to add creativity to their venture (fig. 8.15) very much like land art. These examples suggest that a material practice such as mine can inform other fields of practice that operate beyond the specific context of fine art, and in that sense can offer an alternative approach that bridges the gap between art and technology.

Fig. 8.14. *PS-10 Plant*, Sevilla, Spain (2007)

Fig. 8.15. *Panda Power Plant*, China (2017)

In October 2015, I spent several weeks at the Brewery Tap experimenting with stretchy plastic loom bands in order to create a work that would address specific features of the building. As with previous works in this gallery, I began by observing the space. This led me to notice its many doors, and the way that most of these were never in use. With the idea of articulating these doors by making the space open, I decided to experiment with *fuga*, a formal element of mosaic making that is concerned with the interstices or spaces in-between tesserae. By deploying a technique associated with loom bands, I created *Fuga* (2015), an installation made of around four thousand five hundred of these plastibands and two hundred and twenty hooks and nails with an overall size of approximately 300 x 630 x 1150 cm (fig. 8.16 & 8.17).

Fig. 8.16. de Melo. *Fuga* (2015)

In articulating the six external doors of the Brewery Tap, I blocked selected areas of the space with lines of plastibands. The bands, or units, were connected to each other, which, in effect, created partition walls and three chambers and in doing so directed the flow of visitors within the space. In this way, the work offered viewers a 'phenomenological encounter […] focused on dispersed apprehension' (Potts, 2001:7). To experience the entire work, viewers were required to move in and out of the gallery and enter all three chambers by walking in and out of all six doors, an action that emphasised the temporal and spatialised features of the work.

The process of creating *Fuga* focused on the use of seriality; the repetition of units of a single type, the plastibands. The readymade colours of each of these units were modulated spatially, interacting with the architecture of the Brewery Tap creating 'a focused activation of space' (ibid:17). Every partition wall was made of twenty separate lines of plastibands, running horizontally between the floor and the ceiling. Every wall had different numbers of units as determined by its length. The units were carefully attached to each other by hand, following a specific knotting technique. The walls were also measured manually to avoid problems with the light fittings on the ceiling and other architectural constraints. Avoiding the use of high-tech gadgets or computers during the measuring and planning meant that the entire process centred on a sensorial approach. In addition to the partition walls, the white walls of the gallery served as a good background in that they further aiding the perception of colour. The lines of fragmented colour on the white walls created a greater sensation of depth as well as a certain level of disorientation.

Once *Fuga* was opened to the public, a new aspect of it was revealed. What was not accounted for prior to the setting up of the work was the sensation of speed triggered by the fragmented lines of colour. Viewers coming into the building would immediately comment on the sensation of speed. I was told that some would not even enter the installation thinking that the lines were generated by laser. Furthermore, the work boasted a phenomenological condition unique to the perception of the varied wavelength of each separate colour. This also made the work very difficult to photograph. In this way, *Fuga* provided the viewer with a sensation of space and speed that goes beyond the simple visual configuration of the work, which was due to the spatial modulation of colour and tactility, and interplay of senses. The units were connected in a controlled repetitive sequence. The lines were fragmented by the differences in colour between the units. Seven separate colours were used: green, blue, yellow, white, orange, red and pink. Modulation was controlled, so a specific colour

would not repeat itself in the same linear sequence horizontally, and up to three repetitions vertically, one above the other. The lines were separated from each other by a 15 cm gap, or *fuga*. The careful positioning of every colour produced a seemingly random effect with a sequential colour repetition that was informed by notions of colours in physics. The work evidences how colour manifests itself in nature; that is, through slightly different speeds according to their wavelengths. In this way, our perceptual apparatus can be triggered to sense velocity emanating from an otherwise static arrangement of fragmented colour lines. For instance, red and blue manifest themselves in different speeds of light (wave-length) and are in the opposite range of the spectrometer.

Original in Colour

Fig. 8.17. de Melo. Detail of *Fuga* (2015)

At first impressions, *Fuga* seems far removed from mosaic making. However, the connection between this installation and my broad research on the mosaical lies in the constructive methodology itself. The work was comprised of over four thousand individual units, independent from each other. These units were modulated to form an artwork that created a unifying narrative or phenomenological experience that articulated the architecture of the Brewery Tap. If looked at closely, these units maintained their independence in the same way as tesserae. The other association with

mosaic is in the relation between the work and the surrounding architectural forms. The work enhanced the space and drew attention to specific features of the gallery such as the doors. It mapped out the floor by creating separate areas, borrowing the ability to demarcate specific areas of a room from ancient mosaic floors. Thereby, *Fuga* generated a unique space for sociability and human interaction. Furthermore, this demarcation of smaller spaces forced viewers to acknowledge one another and pay attention to the space available for walking and gathering. In this way, *Fuga* can be interpreted as an antithesis of Serra's *Circuit* (1972) (fig. 8.18). In addition, *Fuga* also addresses the logic of the icon, as inspired by Byzantine mosaic and first developed in sculpture by Tatlin, which was discussed in chapter five. By highlighting specific features of the Brewery Tap the work ensures that 'one attends to them in a qualitatively different way from the architectural interiors one normally inhabits' (Potts, 2001:17).
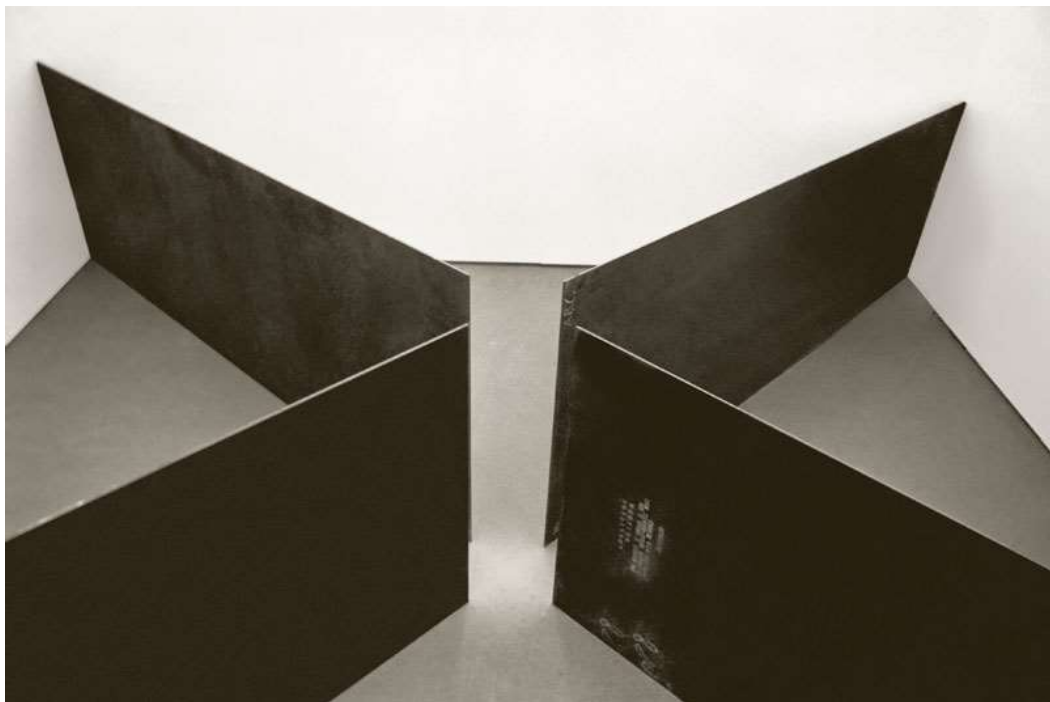
Fig. 8.18. Serra. *Circuit* (1972)

As the above account suggests, *Fuga* can be considered mosaical on the grounds that: it made use of separable, repeatable and interchangeable units; it had a clear relation to the spatial icon through spatial articulation; it dealt with colour modulation through additive synthesis and colour interaction; it had a sense of sculptural three-dimensionality; and, it was pictorial in the sense that it used colour set against a background.

The methodological approach taken with *Fuga* refers to the constructive as well as the pictorial nature of mosaic works. Significantly, this work collapsed the material and the symbolic strata by connecting an ancient tradition to a contemporary approach to making. In other words, it referenced both Byzantine mosaic and Minimalist practices of the 20th century. Furthermore, my practice expands on these traditions by testing the limits of mosaic principles. However, the materiality of my work differs from both traditions, as it is not made of glass tessera, nor bulky pre-designed industrial materials as in the late works of Judd. In this sense, my practice departs from a mosaic mode of production and is more closely linked with Post-Minimalism, which it expands on by reframing it in mosaical terms. *Fuga* investigates the particular issue of speed in the manifestation of colour, where every plastiband, in an atomistic move, is a minimal part. By referencing Serra, *Fuga* is better placed within spatial drawing and its derivation from mosaic principles via Vrubel and the constructivists.

The making process that underpinned *Fuga* generated further thoughts related to the works of Judd and the idea of fast-thinking proposed by Shiff,[153] which then informed parts of my investigative process both conceptual and materially. From this angle, I am confident in claiming that my analysis of Minimalist practice based on a mosaic-centred approach would not have progressed without actually engaging with a process of tangible material production. Crucially, making and thinking occur together in my experimental system of research, they feed each other in a non-hierarchical way; therefore, both are equally important in the development of my thesis.

As the above account shows, as a site of investigation the Brewery Tap was essential to the development of this PhD in art practice. It contributed substantially to my experimentation as an artist and the development and maturing of my ideas. The installation pieces produced specifically with the Brewery Tap in mind facilitated my understanding of site-specificity, the logistics involved in producing work and time management. Through this experience, I came to understand how working with separate serialised units requires a good deal of planning, even though the ideas for the installations were not necessarily fixed at the beginning of each production process. In this sense, having a location in which there was a set of identifiable variables, allowed for a more focused practice.

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[153] Chapter six.

The main aim of my practical research was to deal with site-specificity through the modulation of colour spatially, constrained by mosaic principles. As such, the works developed at the Brewery Tap were the core of my production and contributed experientially to the thesis by testing the limitations of the mosaical within a fine art context. The works focus the debate on mosaic art placing it on a par with painting and sculpture through the exploration of an additive method of construction. The value of my practice lies in how it extends the context for understanding Minimalist and Post-Minimalist practices by reframing them in terms of the mosaical. Significantly, my work connects these practices to a broader framework of art production and analysis proposed by my thesis as a whole and evidenced through a dedicated site of experimentation such as the Brewery Tap.

Ultimately, the experiments I undertook at the Brewery Tap were intended to encourage the mosaical off the walls and floors and into a different type of spatial relationship with the gallery space. The goal was to complete this research process with a strong work that articulated the most notable features of the building. The process started with the articulation of sections of the project space by carefully sensing and paying attention to its particular features. As the sequence discussed previously showed, the installations evolved into a complete articulation of the gallery by drawing attention to its doors, which of course disclose the connections between the inside and outside of the building. By insisting that all doors remained wide open, the work *Fuga* invited the visitors in and showcased the building itself. It allowed the community in Folkestone to visit the old pub and reminisce about its past life and consider its potential as a cultural venue. A visitor even mentioned having a stag party in there and was happy to see it open to the community again.

In my production at the Brewery Tap, the works evidenced the principles of mosaic in spatial terms through the notion of structural tesserae; that is, units not simply embellishing surfaces but creating surfaces of their own. In this way, the unique architectural configuration of the Brewery Tap allowed ideas to connect in practical and experiential ways, evidencing how my research as a whole, and the practice specifically, bridges two traditions that are usually studied and taught in isolation, namely mosaic art and installation art. In my practice these notions are brought together, and this is informed by a historical review that enables the formulation of a new analytical framework through the notion of the mosaical.

Mosaic as an Experimental System

From the outset of this research, I allowed things to connect in a rhizomatic way, without making too many choices and stopping the flow of ideas. However, at the same time, I engaged with a more focused practice to articulate the Brewery Tap through installation work within the context of my historical review, placing mosaic principles at the heart of my investigation. Decision making was necessary along the way because a rhizomatic model has limitations; not everything encountered is necessarily appropriate or workable. This is, after all, a model bound by language, tradition and cultural representation. In this way, the traces revealed within a graphematic space of experimentation through the repetition of material activity and the matter-of-factness of artworks produced, required a channel for communication. Here, this is achieved by a written thesis, which, in this case, historicises the mosaical within fine art practice. Furthermore, considering McLuhan's notions that alphabetic technology coupled with printed language is mosaical, mosaic in its epistemic complexity is thus employed in my research as an experimental system in its own right. For Rheinberger (cited in Schwab, 2013:212),

> [...] working with the notion of "experimental system" in order to make sense of certain aspects of history of science [or art] has in itself an experimental character. You try out how far it takes you, what kind of phenomena you are able to cover with it and where it has – first historically, and second, narratively – its boundaries.

Consequently, the direct result of the repetition of material activity at the Brewery Tap, and in the studio, as well as the writing process, resulted in a new approach to making that is unique to this particular PhD and collapses the boundary between the making and the writing in one conclusive work (fig. 8.19). The research revealed an *epistemic thing* that opened the practice to a previously unthought way of making. This has been the result of a considerable amount of reading, writing, compiling research notes and developing rudimentary concepts, as well as simply 'moving stuff around' allowing the making to be infiltrated by the intellectual beyond the initially proposed articulation of the Brewery Tap. Since then, I have been trying out this new mosaical approach in order to better understand what has happened and use it as a methodological tool that can be carried beyond the PhD process.

It is important to mention that my approach to making is necessarily hands-on. I do not engage with a design practice. As mention previously, sensing plays an important part, and using my hands in the process triggers my thoughts and helps me to articulate

ideas. My making is on a par with thinking along the lines discussed by Sennett in *The Craftsman* (2008). Furthermore, the making itself presents challenges that are resolved by further making, not simply thinking. Tacit knowledge, or *implicit understanding*, plays a major role in making as it 'is partly sedimented in the technical apparatus of the experimental system' (Borgdorff in Schwab et al, 2013:115). Some materials seem to dictate how the work should be made or the way it should look, and, in this sense, the experimental repetition of material activity allows the research to move further. However, some material circumstances do not allow progression. Furthermore, there is always 'the openness and room for not-knowing, or not-yet-knowing' (ibid). There are also dead ends, or times of *material impasse,* when all options seem exhausted alongside aspects of the practice that can be deemed failures and those that do not amount to conclusive outcomes. According to Rheinberger (cited in Schwab, 2013:213),

> [...] if you take seriously the material with which you work, there can always come to a point where you can no longer get along with the concepts you use. Then you will need to find other conceptual tools to get out of the impasse.
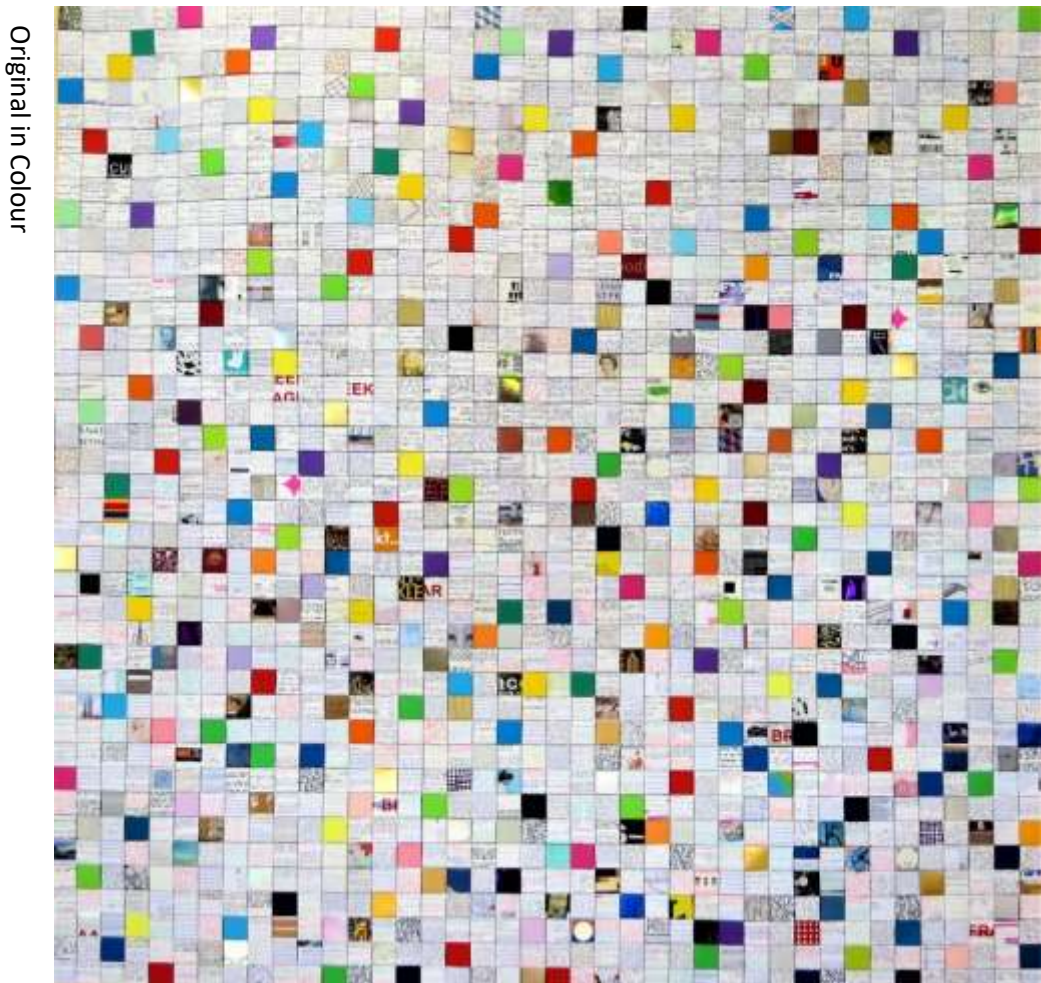
Original in Colour

Fig. 8.19. de Melo. *Enfolded Thesis* (2014-2019)

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That is the kind of impasse that I faced while articulating the Brewery Tap, without considering the new information gathered through reading in my evolving research. Overcoming the impasse included the adoption of my research notes as traces of material and intellectual activity, which resulted in the production of new work. In fact, this turning point occurred when I produced a 3D-printed work (fig. 8.20) titled *Volumetric Units* (2016) that made a clear material connection between the tessera, the cube and the voxel. This particular work became a key tool within my experimental system; *Volumetric Units* ceased being simply an artwork. As a technical object, the largest printed cube of *Volumetric Units* was instrumental in the creative process, enabling the production of a new body of work through folding (fig. 8.21).

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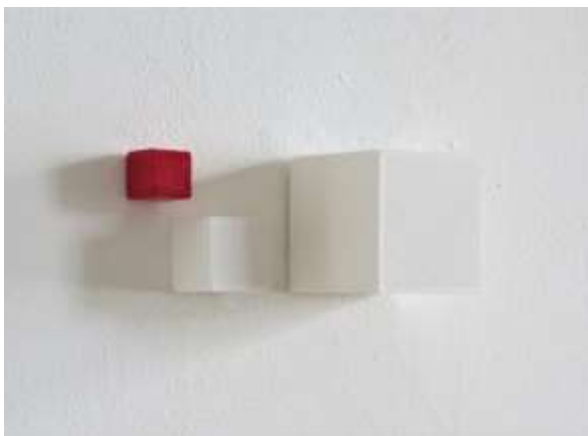
Fig. 8.20. de Melo. *Volumetric Units* (2016)

Fig. 8.21. Cube & Notes (2017)

Consequently, within my experimental system, the concept of enfolding-unfolding aesthetics moved from the thinking process into the making itself, where it was combined it with mosaic principles. This new approach allowed me to generate new work that offered further unfolding potential. My written notes were combined and evolved into an experimental text, which could additionally unfold into sound pieces or even performance. This new way of making enabled me to produce something that I have begun to call *experimental mosaic writing*, a process that began with the generation of an experimental version of the written component of my thesis, an enfolded text that has been published independently. This experimental text functions as an important counterpoint to this written thesis as a non-lineal and fragmented piece of writing, readdressing McLuhan's notion of mosaic as a literary method. In a way, my experimental mosaic system, in all its complexity, presented me with new solutions and a novel way of making that I had not previously contemplated. The novel way of making

surfaced through the experimental research process and it allows me to engage once again with text, sound and performance, something that I left behind in my early days as an actor in Brazil. This unfolding process allowed the word as a form back into my practice, reviving my interest in poetry and languages. Somehow, this finding was an unexpected twist that happened through my research process. I had sensed the potential early on, but without an experimental rhizomatic approach and an open mind the novel element could have remained enfolded.

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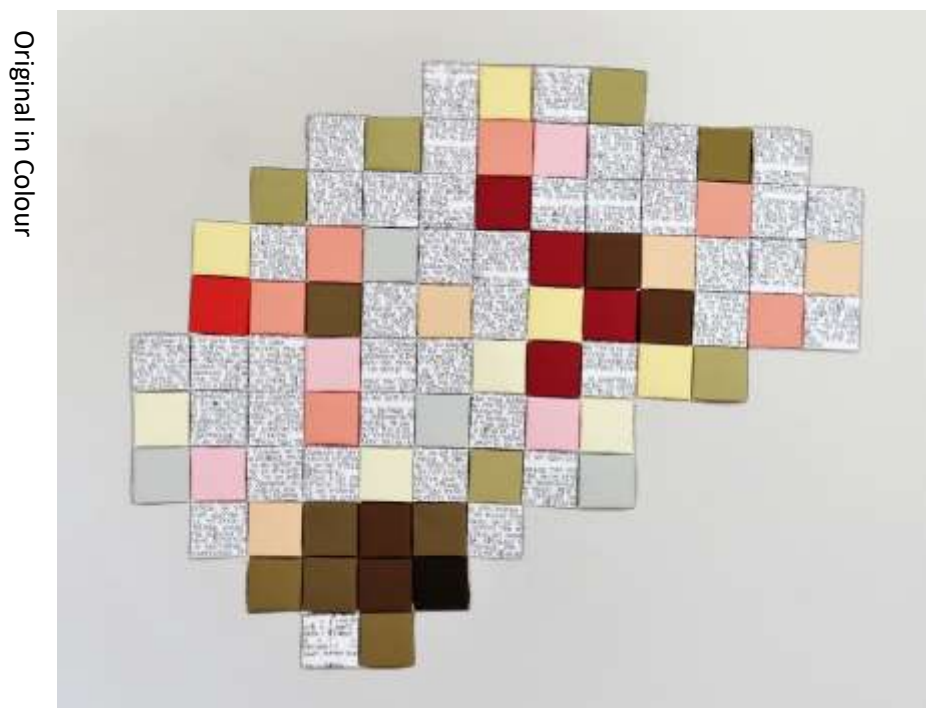
Fig. 8.22. de Melo. *Head Injuries* (2017)

In 2017, further testing my discovery, I produced a work titled *Head Injuries* (fig. 8.22), in response to the UCA Research Conference *Somatic Shifts*, which was themed around the idea of the body in artistic research. *Head Injuries* featured a handwritten version of the entire text 'On Injuries of the Head' [ΠΕΡΙ ΤΩΝ ΕΝ ΚΕΦΑΛΗ ΤΡΩΜΑΤΩΝ] by Hippocrates (c. 460-370 BC) in its original Ionic Greek. The enfolded units in this work were assembled based on a shortcut icon, or *favicon,* of a brain and generated an experimental version of the original text for a possible performance or sound piece.

Equipped with a new way of working that rose out of my research process, I tested its potential once again in my residency in Ravenna, Italy, in May 2017. Upon arrival I discovered that the city was debating the preservation of their heritage and the effects

of street art on their historical city centre. Following the controversy surrounding the street artist known as Invader, I created *Enfolded Debate* (2017), which responded to this artist's invasion of Ravenna. In this work (figs. 8.23 & 8.25), I used paper to recreate Invader's homage to Theodora and Justinian, a work that was removed from Ravenna's historic centre in 2015 (fig. 8.24) just a few days after the artist had made it. Enfolded within my installation is a handwritten copy of the online debate about Invader's work (figs. 8.25 & 8.26), which outraged the Ravennate.

Original in Colour

Fig. 8.23. de Melo. *Enfolded Debate* (2017)

My handwritten paper version invaded the space of the gallery in a phenomenological sense and conceptually reframed the debate on conservation and revitalisation of historic sites, thereby fuelling the controversy around Invader's work. In this piece, the artist's rematerialisation of characters from the computer game Space Invader directly alludes to their own invasion of locations around the world using glass-tile recreations of low-res characters. By restaging his gesture, I expanded upon the debate, further connecting the notions of mosaic, alphabetic writing and iconicity, and created an enfolded text of the debate (fig. 8.26) exhibited alongside the work. This text can be further converted into a sound piece.

Fig. 8.24. Invader. *Theodora & Justinian* [removed] (2015)

Figs. 8.25 & 8.26. de Melo. Detail of *Enfolded Debate* and text version (2017)

The *experimental mosaic writing* seen in *Enfolded Debate* is a new way of working, which is a consequence of the PhD process itself and as such would not have occurred without it. My engagement with art practice and my commitment to this research has spurred a clear progression in terms of my own making and its deployment of mosaic principles, and the way in which those principles are informing works that might not necessarily be associated with mosaic in a traditional sense. It is my engagement with

mosaic, its historicity and a novel fluid notion of the mosaical, that expands the scope of this research and opens the field to new forms of enquiry through practice. Furthermore, my research restores the audile-tactile embodiment of mosaic work, by freeing the written word from the constraints of the printed page and addressing the orality of language. This research offers a method of working that could also be extended to the manipulation of images such as photographs, drawings and posters, and as such could be referred to as *literal Cubism*. The series of images below further illustrate these aspects of the progress made (figs. 8.27 to 8.30).

Original in Colour
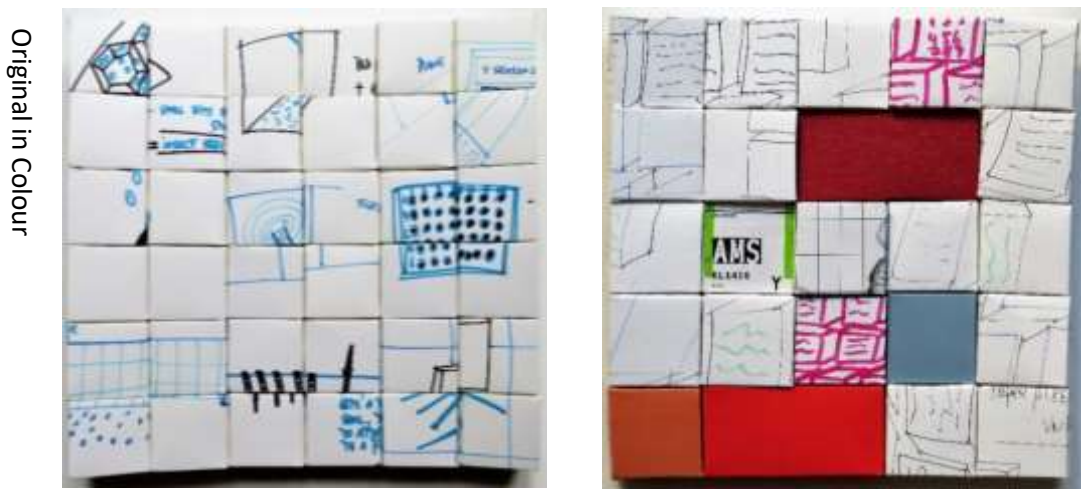
Figs. 8.27 & 8.28. de Melo. *Nine Enfolded Drawings & Random Enfoldment* (2017)

Original in Colour

Figs. 8.29 & 8.30. de Melo. *Enfolded Poster (Bedroom) & Enfolded Film Poster* (2017)

The final topic that I will examine here concerning art practice as research, is the way in which art produces knowledge. A key issue regarding knowledge production through art seems to be the fact that, in Western thought, generating new knowledge is very

much associated with the scientific method and the notion of proof through repeatable experiments. As McLuhan explains in the *Gutenberg Galaxy* (1962), Western thought is a consequence of the specialisms in knowledge created by alphabetic technology and the printing process. For McLuhan, the fact that art and science have, according to Western traditions, ended up in radically different places when it comes to understandings of knowledge production, is a consequence of the printing press; the visual became isolated from the other senses in the production and proliferation of knowledge. The printed word, through movable interchangeable types, stressed the visual to the detriment of a medieval audile-tactile tradition, creating a *mosaic paradox*. That is, it turned mosaic principles from offering a fluid, resonating mode of engagement, into a fixed, perspectival one. In this way, modern thought became disconnected from other forms of sensory engagement. Thus, art became relegated to a matter of individual opinion rather than a matter of shared experience, or proof. However, this is simply a culturally determined construct; the evaluation of art is not simply a matter of opinion. The knowledge produced by art is in fact experiential, more fluid and open ended. An artwork is a material embodiment that has a physical presence in the world. It exists. It has a matter-of-factness that can be studied an apprehended through the senses.

As discussed in *Experimental Systems* (2013), engaging with art practice as research is necessarily engaging with materials in a formalist way. It is moving stuff around to see what happens until a novel element within the practice arises and becomes new knowledge. In other words, it is a matter of further investigation on an epistemic level, generating new understandings that can be communicated. Here, language clearly plays an important part, as it does in the communication of the findings that come from scientific experiments. However, there is a significant difference in the sense that the act of experiencing art does not require an understanding of language per se. According to Kolb (2014:187), Polanyi believed that

> [e]very human creation began with the appreciative apprehension of a concrete experience much of which lay in a tacit dimension beyond explicit naming and communication. The experience was shaped, named, and renamed forming an "idea" that was shared with others to become social knowledge that continue to be refined in their personal knowledge.

As such, art offers a different way of 'making knowledge claims,' which is, at first, experiential, making sense tacitly. To be communicated, art also requires an understanding of formal elements of composition and construction. However, the main

issue nowadays is that the understanding of formal elements of composition have been disregarded as inferior to meaning. Meaning has taken centre stage and this fact creates further problems for art practice. We cannot communicate meaning from thin air, it needs to be anchored in the materiality of the works. For Kubler (1962:vii), 'no meaning can be conveyed without form. Every meaning requires a support, or a vehicle, or a holder.' Therefore, by pursuing a material practice based on a formalist approach, it is possible to generate new artistic knowledge. According to Borgdorff (in Schwab et al, 2013:117-118),

> [a]rt's knowledge potential lies partly in the tacit knowledge embodied within it and partly in its ability to continuously open new perspective and unfold new realities. [...] Research in the arts, then, articulates the "artistic real" as engendered by art practices [...] An artistic "fact", like a scientific, social, or historical fact, is what we make real with our epistemological understandings.

In conclusion, my own art practice set up here as an experimental system, based on the formal elements of mosaic making, articulates the *artistic realities* pertinent to a mosaic method of production that is understood and analysed in a fluid manner, beyond medium specificity. My approach reveals new material circumstances and produces new sensations through the exposition of the work publicly. It also allows enfolded narratives to resurface and gain new values through a re-historicising of past movements and practices, opening new avenues for future investigation and the production of new work.

Future Research

The new aesthetic formalism based on mosaic principles advanced by this thesis is seminal and offers a rich ground for further investigation. My findings, beyond the constraints of the Brewery Tap as a site for investigation, can be further explored in two distinct ways: (1) as a model for artistic experimentation and art production, and (2) as a conceptual framework for the analysis of contemporary visual culture, within the new Electronic era where mosaic as mode of structuring the visual takes centre stage.

Advancing my research, based on an engagement with an alternative literary production through art practice, I have already begun to work on a new project experimenting with the oeuvre of Brazilian poet Paulo Leminski (figs. 8.31 & 8.32), looking at how his literary production can inform a new conceptual strategy for contemporary fine art

practice and research, centred on his portmanteau word *perhappiness*.[154] I intend to unfold an alternative narrative for Leminski's contribution to knowledge. Through the methodological approach developed here, I am equipped with a novel research method that allows me to investigate Leminski's writings in an interdisciplinary (mosaical) manner to elaborate conceptual strategies for the production of new artworks and experimental texts that address the audile-tactile quality of his poems. The potential of my doctoral research lies on its method of artistic production that reveals enfolded historical narratives, enabling a crossover between disciplines and the production of new knowledge.
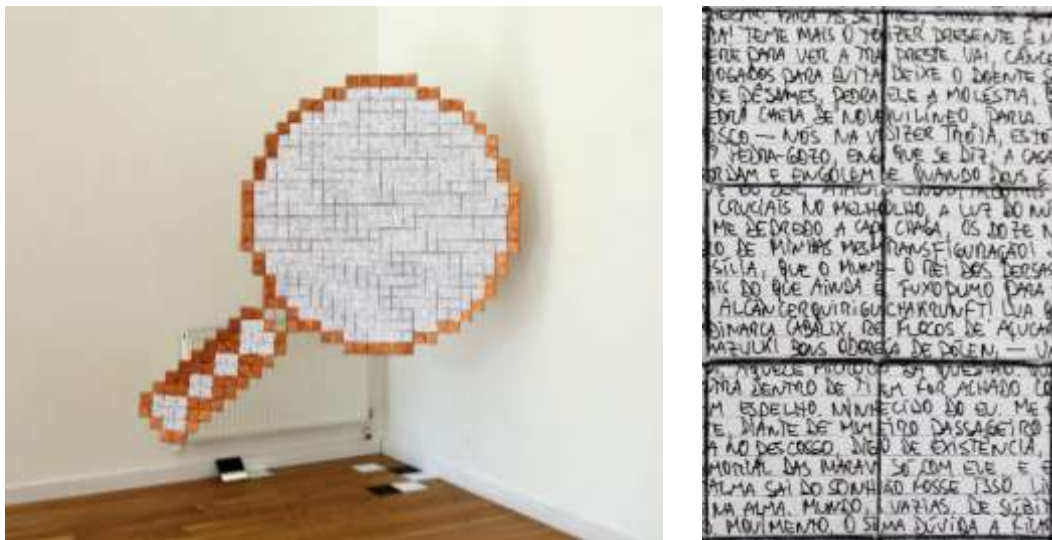
Figs. 8.31 & 8.32. de Melo. *Retitícios das Interscêcias* (2019)[155] and detail

In terms of criticism, I intend to further my research by producing new articles analysing the work of contemporary practitioners along the lines proposed here, evidencing how the mosaical is a subversive force in contemporary fine art, which recovers intrinsic aesthetic values that undermine the intense focus on meaning and the documentary function of art.

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[154] Uncertainty and felicity.

[155] *Retitícios das Interscêcias* (2019) features a handwritten copy of Leminski's ground-breaking book *Catatau* (1975), an experimental text about the fictitious visit of René Descartes to Nova Holanda (Nederlands-Brazilië) by invitation of Johan Maurits van Nassau-Siegen. This work was included in my PhD conclusion exhibition *Units of Colour Units of Knowledge* at the Brewery Tap (May 2019), making the link between my doctoral research and my future project investigating Leminski's *Perhappiness* as a conceptual strategy in artistic research.

Conclusion

In 2014, Chinese artist Ai Weiwei was *set loose* at the infamous Prison Building of Alcatraz in San Francisco. His exhibition *@Large* dealt with the 'intrinsic conditions of contradiction' that shaped his personal life under constant Chinese surveillance (Dean & Moore in Spalding [ed.] 2015:9). For his occupation of Alcatraz, Ai Weiwei produced several installation pieces, including *Trace* (2014), a floor work consisting of one hundred and seventy-six portraits of political prisoners from around the world made of a vast number of LEGO plastic bricks (fig. c.1). *Trace* embodies, in a straightforward way, the concept that has been articulated by this research; the mosaical is prevalent in contemporary fine art practice. *Trace* manifests the way in which mosaic principles have informed the passage of the art work from the built environment of construction to the virtual environment of digital technologies, through Modernist experiments with the grid and use of elemental units of composition. Ai Weiwei's work comes full circle to reveal the recent return of mosaic to a new tangible materiality informed by digital processes of data visualisation. In other words, Ai Weiwei's *Trace* presents a new mosaic materiality informed by the enfolding and unfolding of events, concepts and materials.

> Assembling a multitude of small parts into a vast and complex whole, the work may bring to mind the relationship between the individual and the collective, a central dynamic in any society and a particular charged one in contemporary China (Spalding, 2015:68).

Original in Colour

Photo: © April Kilcrease

Fig. c.1. Ai Weiwei. *Trace* (2014), courtesy of the artist

Mosaic, in this description, clearly serves as a metaphor for contemporary Chinese society. A comparable piece is found in Ai Weiwei's *Sunflower Seeds* (2010) exhibited at Tate Modern's Turbine Hall in London, which created a visual whole using a vast amount of minute individual ceramic pieces. With *Trace*, by deploying an obvious mosaic method aided by digital processes and adopting a pop-art style reminiscent of Andy Warhol's iconic serigraphs, Ai Weiwei highlighted the *fragmented iconicity* so characteristic of contemporary visual culture. In essence, *Trace* is a gesture that elevated the prisoners to celebrity status through an approach that goes beyond Warhol's technique. Ai Weiwei rematerialised digital imagery and revisited the fragmentation of the pictorial surface very much in keeping with a Byzantine aesthetic. Furthermore, *Trace* is exhibited on the floor of the gallery, restoring horizontal viewing in a manner comparable to Carl Andre's 'metal carpets.' However, Ai Weiwei's is an installation that denies the viewer full cognitive and phenomenological access, as one cannot walk on the work. As such, it does not address cognitively the complex phenomenology of viewing associated with floor mosaics; Ai Weiwei's prisoners are simply pictures on the floor. Nonetheless, they claim a sculptural space through their materiality and display, populating a vast area of the prison, allowing viewers to walk around its constituent parts. In this sense, *Trace* can be considered an example of an installation that is clearly mosaic in form in all its complexity.

As this thesis has argued, the manifestation of mosaic principles is varied and non-linear, and determining the mosaicality of contemporary artworks is not necessarily an easy task. In this research, that task has been supported by an engagement with a material practice centred on mosaic that allows new readings to come to fruition and enfolded narratives to be brought to light. My experimental mosaic production has enabled me to connect an ancient way of making to the contemporary world of fine art and visual culture. It is an experiential approach that informs the understanding developed here of mosaic as deeply engrained in our culture and extremely prevalent as a mode of structuring the visual, despite the lack of traditional mosaic works in major museums and fine art collections. More specifically, I proposed the *mosaical* as a concept, my contribution to art making as well as an analytical framework, developed within a graphematic space and communicated through this written output, which was arrived at by exploring an additive method of making, pertinent to composition and construction, based on the modulation of independent, discretised and interchangeable units to form a consistent whole. Furthermore, identifying examples of new mosaics in the contemporary art circuit, such as Ai Weiwei's *Trace*, has further

corroborated my research in highlighting the need for a discussion within a broader frame of reference, beyond medium specificity. As such, the analysis put forward here is my main contribution to knowledge: a *new aesthetic formalism* based on mosaic principles that is relevant to current art debates such as digital aesthetics, design, sculptural practice and more importantly art education.

Accepting the hegemonic art-historical view that mosaic art reached a pinnacle in the Byzantine era and has been in decline ever since, to the point that it is now understood simply as a craft devoid of expressive and artistic potential, throws up a problem when attempting to explain works such as *Trace.* In showing that mosaic did not disappear or go into decline, my research addresses that problem; mosaic became interstitial, enfolding and emerging again within painting and sculpture, as highlighted by this thesis. Furthermore, this thesis has shown that the unique method of mosaic was developed through *techne* into a tool for data visualisation in digital technologies and, through *kunstwollen*, it enabled abstractionism to come to the fore and provided sculpture with an underlying constructive approach. A connection between the constructive line and the compositional is intrinsic to the materiality of mosaic; it merges the material and symbolic strata, whether within an actual or virtual environment. In this way, in the electronic realm, mosaic functions as a membrane to the visual, turning code into images.

The new reality of mosaic in contemporary visual culture, above or beneath human perceptual levels, is a legacy of the experimental culture in Europe at the end of the 19th century and its exploration of optic theories both in art and science. In this climate mosaic principles offered an approach that appealed to both artists and scientists, which had the effect of infiltrating in technical terms the legacy of the Renaissance mode of representation, foregrounding the end of the Gutenbergian era and adopting a structuring mode compatible to the emerging Electronic era; a paradigmatic shift that became apparent in the 1960s, and it still deserves further attention.

As this study has shown, Byzantine practitioners fully articulated mosaic in pictorial and phenomenological terms, and then, at the end of the 19th century, mosaic was explored in painting as a form of resistance to the naturalism perpetuated by the art academies. This experimentation with an additive method of composition led to the fragmentation of the pictorial surface, as exemplified by Post-Impressionist practice as well as the works of Vrubel and the Russian avant-garde. By the early part of the 20th century this had unfolded as abstractionism. Through practical experiments, artists began to realise

that the mosaic principle of combining units additively could only be truly expanded and fully articulated in three dimensions. Painting restrained and constrained them. Consequently, experiments with faktura led to a move towards mosaical three-dimensionality. Thus, sculptural fragmentation came to the fore, based on additive methods of material modulation and influenced by the logic of the spatial icon. In this way, mosaic principles became important in the development of a sculptural approach based on construction, which advanced a whole new approach to sculpture in two distinct ways: heterogeneous assemblages and homogeneous seriality of identical forms. The latter of these approaches was fully realised in the works of Judd, Andre and other Minimalists. Furthermore, the image-making aspects of mosaic articulated in the Byzantine era involving the manipulation of light through glass technology, was further developed within the nascent technologies of printing in the 19th century, later moving to television and digital screens aided by electricity.

Despite the tendency of recent digital technologies to naturalise the image, a legacy of the Renaissance, the Byzantine mode of representation is the chosen mode of structuring our visual environment. The recent *material turn* of current fine art practice influenced cognitively by computer technology reveals a concern with material qualities that is very much related to the mosaic art of the past, particularly when it comes to the creation of works that deal with aspects of the digital in a new material reality. This new mosaic materiality is at the heart of contemporary practice and it is exemplified, in a straightforward manner, by works such as *Trace* (2014). However, as a counterpoint to the pictoriality of Ai Weiwei's work, I would like to conclude with another compelling example, *The London Mastaba* (2016-2018) by Christo and Jeanne-Claude, that floated on the Serpentine Lake in Hyde Park, London, in the summer 2018 (fig. c.2).

In the shape of an ancient Egyptian mastaba,[156] or burial monument, *The London Mastaba*, confirms that the constructive line of mosaic making undoubtedly informs contemporary sculptural practice. Resembling enlarged Sumerian terracotta mosaic cones, the 7506-painted-barrel units of the work took over two months to be stacked up. The additive method of construction through the spatial modulation of independent units of colour makes this 600-tonne structure appear much lighter. As the units are not set flush, they produce the illusion of lightness caused by optical lift-off, characteristically a Byzantine effect. Depending on the approach, the mastaba looks

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[156] The shape of a mastaba, or a *bench of mud* in Arabic, is thought to be borrowed from ancient Mesopotamian architecture. *The Standard of Ur* (2600-2400 BC), introduced in chapter two (fig. 2.1), is the earliest example of this particular shape associated with mosaic making.

very much like a mirage, or a digitally rendered image on the landscape. The perception of it as digitally rendered is triggered by the regularity and serialisation of its units of colour, which is also a characteristic of digital graphic interfaces. Having the notion of point-horizon in mind, the scale of the units varies considerably, from massive building blocks at a close proximity to dots in the distant landscape. Thus, the sensation of it as being *unreal* is very much wired in us cognitively, a consequence of our experiences with virtual environments of digital technologies. The doubt is ever so present. Through a mosaical approach to making, *The London Mastaba* collapses the architectural, the pictorial and the sculptural into one single work and thereby strengthens an understanding of the Byzantine mode of representation as the structuring mode in contemporary visual culture based on mosaic principles. Christo himself declared: 'depending on the light, the barrels transform into a Byzantine mosaic' (Malaval, 2018:6).

Original in Colour

Fig. c.2. Christo and Jeanne-Claude, *The London Mastaba*, Serpentine Lake, Hyde Park (2016-2018), courtesy of the artists

The segmented and discontinuous image had already been produced over long periods of time in different cultures and it too deviated from the naturalistic-illusionistic styles of previous eras […] with their roots in pre-modernity […] The modern age completes the great circle uniting the past to the present and the future.

(Barilli, 2012:123)

Image References

Introduction

Fig. i.1. de Melo, M. (2004) Detail of *Shattered Dreams* [sculpture]. Image by the author: Amsterdam.

Chapter One

Fig. 1.1. de Melo, M. (2015) *Soft Corner* [installation]. Image by the author: Amsterdam.

Fig. 1.2. de Melo, M. (2018) *Individual pixels of an LCD screen* [photography]. Image by the author: Amsterdam.

Chapter Two

Fig. 2.1. Unknown (2600-2400 BC), *The Standard of Ur* [object]. Image courtesy of the British Museum ©Trustees of the British Museum: London.

Fig. 2.2. Unknown (1400-1521), *Serpent Mask of Tlaloc* [object]. Image courtesy of the British Museum ©Trustees of the British Museum: London.

Fig. 2.3. Unknown (4th century), *Bikini Girls Mosaic*, Villa Casale, Sicily [floor mosaic]. At: https://commons.wikimedia.org/wiki/File:Mosa%C3%AFque_des_bikinis,_Piazza_Armerina.jpg (Accessed 25.10.2018).

Fig. 2.4. Unknown (325–350 AD), *Tigress Attacking a Calf* [marble opus sectile]. At: https://upload.wikimedia.org/wikipedia/commons/9/90/Tiger_calf_Musei_Capitolini_MC1222.jpg (Accessed 09.12.2016).

Fig. 2.5. Unknown (6th–15th century), *Mosaic Tesserae* [Glass]. At: http://metmuseum.org/art/collection/search/708074 (Accessed 09.12.2016).

Fig. 2.6. Unknown (ca. 3500–3100 BC), *Mosaic Cones* [terracotta]. At: http://metmuseum.org/art/collection/search/325524 (Accessed 09.12.2016).

Fig. 2.7. Policicchio, S. (2014) *Olga Zakharova* [mosaic]. Image courtesy of the artist: Ravenna.

Fig 2.8. Unknown (c. 3000 BC), *Cone Mosaic Courtyard* [mosaic]. At: https://upload.wikimedia.org/wikipedia/commons/3/3f/Pergamonmuseum_Inanna_01.jpg (Accessed 09.12.2016).

Fig. 2.9. Vitruvius (c. 15 BC), *Mosaic Setting Bed* [sketch]. In: Farneti, 1993:128.

Fig. 2.10. Ceccarossi, R. (2011), *Tappeto* [mosaic]. Image courtesy of the artist and Luca Maggio: Ravenna (https://lucamaggio.wordpress.com).

Fig. 2.11. Gregory, W. J. (1935), *Tesserae Inclination* [sketch]. Image courtesy of the Byzantine Institute and Dumbarton Oaks Fieldwork Records and Papers, c. 1920s-2000s, Dumbarton Oaks, Trustees for Harvard University, Washington, D.C.

Fig. 2.12. $CaCO_3$ (2015), *Cattedrale* [mosaic]. Image courtesy of the artists: Ravenna.

Fig. 2.13. de Melo, M. (2015), *Inclination Plates* [assemblage]. Photo by the author: Amsterdam.

Fig. 2.14. Koruza, A. (2008), *Tessera e Fuga #1* [mosaic]. Image courtesy of the artist and Luca Maggio: Ravenna (https://lucamaggio.wordpress.com).

Fig. 2.15. Koruza, A. (2008), *Tessera e Fuga #5* [mosaic]. Image courtesy of the artist and Luca Maggio: Ravenna (https://lucamaggio.wordpress.com).

Fig. 2.16. Koruza, A. (2011), *Slovenia Structured #1* [sculpture]. Image courtesy of the artist and Luca Maggio: Ravenna (https://lucamaggio.wordpress.com).

Fig. 2.17. Serra, R. (2015), *Equal* [sculpture]. At: http://davidzwirnerbooks.com/do-not-enter-or-modify-or-erase/client-uploads/ZWI015-SerraEqualPoster_FINAL.jpg (Accessed 18.12.2018).

Fig. 2.18. NASA (1990), *Pale Blue Dot* [Photography]. At: https://commons.wikimedia.org/wiki/File:PaleBlueDot.jpg (Accessed 19.07.2018).

Fig. 2.19. de Melo, M. (2015) *Red Cube on White Tessera* [sculpture]. Image by the author: Amsterdam.

Fig. 2.20. Meireles, C. (1970) *Southern Cross* [sculpture]. ©Cildo Meireles (Fair Use). At: https://uploads4.wikiart.org/images/cildo-meireles/southern-cross-1970.jpg (Accessed 16.05.2018).

Fig. 2.21 Unknown (c. 100) *Edible Fish* [mosaic floor emblemata] Image courtesy of the British Museum ©Trustees of the British Museum: London.

Fig. 2.22 Sophilos (c. 200 BC) *Thmuis Mosaic* [mosaic]. At: https://commons.wikimedia.org/wiki/File:Mosaic_of_Berenice_II,_Ptolemaic_Queen_and_joint_ruler_with_Ptolemy_III_of_Egypt,_Thmuis,_Egypt.jpg (Accessed 18.12.2018).

Fig. 2.23 Herakleitos (2nd century) *Unswept Floor* (copy) [mosaic]. At: https://en.wikipedia.org/wiki/Sosus_of_Pergamon#/media/File:Restes_du_banquet,_mosa%C3%AFque.jpg (Accessed 12.12.2016).

Fig. 2.24 Unknown (6th century) *Empress Theodora*, San Vitale [mosaic]. At: https://commons.wikimedia.org/wiki/File:Meister_von_San_Vitale_in_Ravenna_008.jpg (Accessed 27.07.2018).

Fig. 2.25. Farmanfarmaian, M. (2010) *Convertible Series*, Group 4 [mirror mosaic]. At: https://commons.wikimedia.org/wiki/File:Monir_Shahroudy_Farmanfarmaian,_Group_4_-Convertible_Series-,_2010,_1_26_18_-mcachicago_(39568449494).jpg (Accessed 09.01.2019).

Fig. 2.26. Cragg, A. (1981) *Britain Seen from the North* [assemblage]. At: http://www.tate.org.uk/art/images/work/T/T03/T03347_10.jpg (Accessed 09.12.2016).

Fig. 2.27. Anatsui, E. (2001) *Man's Cloth* [sculpture]. At: https://upload.wikimedia.org/wikipedia/commons/8/8f/El_Anatsui_-_Man%27s_Cloth.jpg (Accessed 19.07.2018).

Chapter Three

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Fig. 3.3.   de Melo, M. (2018) *Opus Paladianum* [sketch]. Image by the author: Amsterdam.

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Fig. 5.1. Unknown (2nd century BC) *The Nile Mosaic* [mosaic]. At: https://upload.wikimedia.org/wikipedia/commons/2/27/Mosa%C3%AFque_nilotique%2C_Praeneste%2C_Italie.jpg (Accessed 10.09.2018).

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Fig. 6.2.   Smith, T. (1962) *Die* [sculpture]. At: https://www.moma.org/media/W1siZiIsIjYzMDk1Il0sWyJwIiwiY29udmVydCI sIi1yZXNpemUgMjAwMHgyMDAwXHUwMDNlIl1d.jpg?sha=ed48959ef91495 3d (Accessed 10.09.2018).

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Fig. 6.14. Judd, D. (1991) *Untitled* [sculpture]. At: https://www.moma.org/media/W1siZiIsIjI5MjQ3NCJdLFsicCIsImNvbnZlcnQiLCItcmVzaXplIDIwMDB4MjAwMFx1MDAzZSJdXQ.jpg?sha=ab53daf75e53ca38 (Accessed 12.09.2018).

Fig. 6.15. Judd, D. (1969) *Untitled* [sculpture]. At: https://d2u3kfwd92fzu7.cloudfront.net/catalog/artwork/gallery/1111/Judd_E-078.jpg (Accessed 10.09.2018).

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Fig. 6.21. Andre, C. (1970) *37 Pieces of Work* [sculpture]. At: http://pds23.egloos.com/pds/201109/02/85/a0011285_4e606a752f5df.jpg (Accessed 12.09.2018).

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Fig. 7.1.   de Melo, M. (2015) *Surface* [installation]. Image by the author: Amsterdam.

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Fig. 7.16. Cragg, A. (1981) Detail of *Britain Seen from the North* at Tate Modern, London, 2000 [assemblage]. At: https://lianabortolozzo.files.wordpress.com/2012/01/t03347_10.jpg (Accessed 20.12.2018).

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Fig. 7.29. de Melo, M. (2011) Detail of *As a Blind Man Looking for a Black Cat that Isn't There* [interactive installation]. Image by the author: Amsterdam.

Fig. 7.30. de Melo, M. (2015) Full spread of *The Book of Quick Responses* [publication]. Image by the author: Amsterdam.

Fig. 7.31. de Melo, M. (2017) *Encoded Tesserae* [mosaic]. Image by the author: Amsterdam.

Fig. 7.32. de Melo, M. (2017) *Encoded Tesserae* [mosaic]. Image by the author: Amsterdam.

Fig. 7.33. de Melo, M. (2016) *Art Bars* [interactive sculpture]. Image by the author: Amsterdam.

Fig. 7.34. de Melo, M. (2016) *Encoded Carl* [interactive installation]. Image by the author: Amsterdam.

Fig. 7.35. Rozin, D. (2001) *Trash Mirror* [sculpture]. Image courtesy of the artist: New York.

Fig. 7.36. JODI (2002) *Text* [screen capture of internet-based work]. Courtesy of the artists: At: http://text.jodi.org (Accessed 16.05.2018).

Fig. 7.37. Unknown (c. 587) *Defaced figures with small cities in the mosaic at St. Stephen's Church, Umm Er-Rasas* [mosaic]. Courtesy of the Studium Biblicum Franciscanum, Jerusalem. In: Bowersock, 2006:100.

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APPENDIX

Mosaic Strategies in the Work of Isabel Ferrand

Fig. x.1. Ferrand. *Lisboa-Luanda, a Sea Journey* (2003)

Isabel Ferrand's life story informs much of her art. Growing up as the only daughter of a colonel, she spent her childhood in Guinea-Bissau and Angola, where the Portuguese army was stationed. Unlike the men in her family, she chose the world of art instead of the military.

The long distances travelling to Africa made a big impression on Isabel, and for a while the Portuguese artist dedicated her practice to measuring the distance travelled between two geographical locations. This *measuring of distances* generated a series titled 'Metrication', of which *Lisboa-Luanda, a Sea Journey* (2003) is exemplary (figs. x.1 to x.4).

The main material used for this conceptual work is polyester thread, an inspiration drawn from the contents of her grandmother's sewing box – another childhood legacy, and one that connects the artist's work to textiles and domestic environments. 'Lisboa-Luanda' is comprised of 24303 spools of polyester thread that each measure 300 metres, measuring 7291 kilometres in total – the exact distance travelled between the ports of Lisbon in Portugal and Luanda in Angola. Here, Isabel uses a display strategy associated with mosaic making. The spools are put together to create the visual elements necessary to bind the narrative. In a sense, Isabel Ferrand deploys mosaic strategies as means of data visualisation. The placement of compositional elements comprised of partible units side by side renders poetically the measured distances travelled by the artist and makes her concept accessible to the viewer. Furthermore, the installation is shown as a self-contained room, allowing the visitor an intimate connection with the work and the spaces around and between them – a phenomenological engagement that can be compared to a visit to the Galla Placidia Mausoleum in Ravenna or the installation work *Wall Drawing 38* (1970) by minimalist artist Sol LeWitt.

Like many of her contemporaries, Isabel Ferrand belongs to a generation of multidisciplinary artists that can be associated with the 'post-medium condition' that has been conceptualised by Rosalind Krauss and explored in the previous issue of this magazine. Isabel uses a variety of materials such as paper, threads and ceramics, in order to create works that juxtapose the military background of her family with domesticity and textile traditions. Modulation of materials, compositional repetition of elements, and fragmentation are a constant in her art production, contributing to our understanding of artistic practices relevant to the study of mosaic within a contemporary fine art context.

Isabel Ferrand was Born in Portugal. She lives and works in Utrecht, the Netherlands; Studied at Utrecht School of Fine Arts; Artworks in public collections: *Museu Militar* in Lisbon, Portugal, the *Army Museum* in Delft and the *Museum Gouda* in the Netherlands and *Karelia Museum* in Petrozavodsk, Russia.

Original in Colour

Fig. x.2. Ferrand. Installation view of *Lisboa-Luanda, a Sea Journey* (2003)

Figs. x.3 & x.4. Ferrand. Details of *Lisboa-Luanda, a Sea Journey* (2003)

Nomadic Aesthetic: El Anatsui in Amsterdam

On the 24th November 2016, I attended the opening of Meyina, a solo exhibition by Ghanaian artist El Anatsui (1944) at the Prince Claus Founds Gallery, in Amsterdam. The works on display were made exclusively for the exhibition. A rare experience to see several of El Anatsui's bottle cap tapestries together, I noticed how they reacted magically to the venue's artificial light. Also, they felt much more intimate than the artist's monumental works, such as *TSIATSIA Searching for Connection* (2013) (which covered the entire façade of the Royal Academy building in London), or *Drying Towels and Pants* (2013) at the ArtZuid 2013 sculpture event in Amsterdam (fig. x.5). For ArtZuid, El Anatsui's work was hung from trees over a later cast of Rodin's *The Thinker*. Nothing compared to the white cube experience of Meyina.

Fig. x.5. El Anatsui. *Drying Towels and Pants* (2013)

Much has been said about El Anatsui's groundbreaking works, and his contribution to contemporary art in an international context. El Anatsui has become part of the art canon. His oeuvre has been analysed within post-colonialist trends in art, in conceptual associations with African textiles, or simply through formal compositional elements. The affinity of his work with mosaic has also been considered, a fact that opens his

production up to interesting interpretations and strengthens the polysemic nature of his oeuvre and its engagement with multiple traditions. Occasionally, El Anatsui's metal caps and bottlenecks works are referred to as aluminium mosaics and sometimes as textiles. However, most commonly, they are studied within the expanded category of sculpture.

Fig. x.6. El Anatsui. *Untitled* (2016) and *Horizon* (2016)

When it comes to travelling, these monumental works are carefully folded and fitted into boxes. As they are flexible and do not maintain their original shape, El Anatsui encourages the curators to reconfigure them on arrival to best suit the needs of the new location. For the artist, these circumstances imbue the works with an ever-changing nomadic aesthetic. In 2013, sections of *Drying Towels and Pants* were placed on top of hedges and trees, vulnerable to weather conditions. Several pieces of the work fell off and were collected by passers-by.

In Meyina (figs. x.6 to x.9), the works were impeccably lit and hung beautifully, revealing an interesting play of light and shadow that created a sense of opulence in the works. This reminded me of the Brazilian expression 'o luxo do lixo', the luxury that emanates from trash: referring to the creative ability of turning discarded materials into "luxury goods". It is a gesture that, in a way, turns the capitalist value system on its head. The exuding luxury and shimmer of El Anatsui's installations also have a parallel to the gold surfaces and spiritual nature of Byzantine mosaic. But the parallels to mosaic do not stop there. Compositionally, the artist employs seriality, unit interchangeability and modulation: a method of repeating patterns made from independent units. Historically,

this way of working evidences the return of methodological and formal concerns closely related to mosaic making. Also informing El Anatsui's aesthetic is the advent of the ready-made and the influx of mass-produced objects, as well as their abundant availability. These are concerns that eventually connect mosaic principles with the recycling mode of production favoured by many contemporary artists, from Tony Cragg's floor and wall assemblages of the 1980s to El Anatsui himself.

Fig. x.7. El Anatsui. Detail of *Oases* (2014-2016)

Fig. x.8. El Anatsui. *Oases* (2014-2016)

The production of El Anatsui's works also reminded me of how ancient mosaic workshops from Roman times employed several assistants to prepare tesserae in large quantities in advance, to be assembled in situ. El Anatsui employs assistants to select, cut and shape the found aluminium caps and bottlenecks. Colour and shape are very important for the artist, and his assistants prepare sections of the works accordingly. After each section is produced by connecting the aluminium tesserae with copper wire, El Anatsui fits these sections together to complete the work. His favourite unit shape seems to be rectangular. However, there is a variety of shapes in his works, and more recently, square tesserae have also been used. These squares are usually made of metal printing plates and it is possible to read some of their content (fig. x.7). The work *Oases* (2014-2016) is a good example of how he composes with squares and one of my favourites. Meyina also offered good insights into El Anatsui's early career by displaying works on wood, drawings, documents and publications. [Meyina, Prince Claus Fund Gallery, Amsterdam, 24 November 2016 to 28 April 2017].

Fig. x.9. El Anatsui. *Default* (2014-2016)

Toys as Tesserae: Eugenio Rivas' Just Animals

The human condition and the idea that we are nothing more than animals are concepts that take centre stage in the work of Spanish artist and researcher Eugenio Rivas. His prolific output comprises paintings, sculptures, and more recently installation work. Ice cream and dogs feature prominently in his oeuvre that is underlined by the juxtaposition of cultural and natural imagery. Rivas imbues his postmodernist discourse with absurdity and irony. Although most critics are concerned with what Rivas' work might mean, the formal aspects of his practice deserve attention as well.

Fig. x.10. Rivas. *Pig Love* (2014)

In order to create his narrative, Rivas makes use of large quantities of mass-produced toy animals. Designed for children, they still serve the purpose of educating youngsters through play. Rivas takes this didactic aspect and spins it further by placing these toys within the context of an art gallery. This gesture further asserts the transfunctionality of these toys, strengthening their meaningful-meaningless condition, reemphasising the quintessentially (post)modernist question 'what is art'? This point alone is not necessarily new or ground-breaking, but the fact that his series *Just Animals* can be associated with mosaic making is. Why? The work *Pig Love* (2014) for instance (figs. x.10 & x.11), is made of assorted animal toys carefully placed side by side, forming the silhouette of a pig. The word LOVE is created by the spaces in-between these toys. Love here is interstitial, and the toys are used as tesserae. They are serialised and with great

interchangeable potential between themselves. Of course, the artist did not actually make these units. However, this should not disqualify them as tesserae.

Fig. x.11. Rivas. Detail of *Pig Love* (2014)

Fig. x.12. Rivas. *Be Happy* (2014)

In this case, it is good to note that mass production and the availability of serialised goods have enabled mosaic elements to flourish within fine art, within traditions not necessarily associated with mosaic making. In a sense, the advent of the Duchampian

ready-made and the influx of mass-produced objects in art, as well as their availability and seriality, evidences the return of methodological and formal concerns related to mosaic making. Rivas' *Be Happy* (2014) (fig. x.12) is another good example of these "new" mosaics that have found their way into contemporary art galleries. The postmodernist discourse that has been used to address Rivas' work does not take into account the mosaic trajectory, a narrative that seemed to have been lost within the interstices of history.

Rivas' other works in this series (figs. x.13 to x.15) such as *I Want You to Be Happy* (2013), *Now I Wanna Be Your Dog* (2014) and *Take It Easy* (2014) can also be understood as mosaic works. They do not create silhouettes of animals or geometric shapes like *Pig Love* and *Be Happy*. However, they create images of thought and manage to articulate the fine line between sculptural and pictorial concerns through the use of partable, serialised units place side by side. Through this method of working with repetition, fragmentation and modulation of units, Eugenio Rivas has managed to create a compelling and still meaningful series without even having the notion that he was tapping into a mosaic way of making, through the use of an additive method of construction and composition. His practice though, is not unique in the use of mosaic elements. There are plenty of examples out there to be re-evaluated and reconsidered within the tradition of mosaic art.

Eugenio Rivas was born in Córdoba, Spain in 1982. He obtained a doctoral degree in Fine Art from the University of Granada in 2012. He currently lives and works in Málaga.

Original in Colour

Fig. x.13. Rivas. *Take it Easy* (2014)

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Fig. x.14. Rivas. *I Want You to Be Happy* (2013)

Fig. x.15. Rivas. *Now I Wanna Be Your Dog* (2014)

Maher Dawoud: Found Mosaics and the Poetics of Pain

My first contact with Maher Dawoud's conceptual mosaics was through the exhibition of the 1st Edition of the International Competition AIMC Student Prize in Ravenna (2015). In that occasion, I saw the works *Chocolate Bar* (fig. x.16) and *Sweet Corn* (fig. x.17), developed together with his students Maggy Maged and Christine Zarif as the result of a workshop dedicated to the idea of depression and cancer cells. The works consisted of a cast chocolate bar covered with medicine pills, a corn on the cob also with pills, as well as a third work made of sugar cubes and resin (fig. x.18). Apart from the unusual materials, I understood this third piece easily. However, the first two – *Chocolate Bar* and *Sweet Corn* – interesting in their own right, did not seem to have an obvious connection with mosaic art. They felt simply like assisted ready-mades, instead of mosaic works *per se*. After careful analysis, I understood the mosaicality of these sculptures. What struck me was the way in which the segmentation of the works in question proposed something new, something that I now call found mosaic *i.e.* found tessellation that exists in nature or in some industrial goods. The chocolate bar offered a ready-made *opus regulatum* that was appropriated by the artist. The maize offered them the same thing: a found structure that resembled mosaic work in their segmentation, spaces between units and placement. The appropriation of this fragmented regularity of the chocolate bar and the corn on the cob validated them as mosaic work, and consequently their inclusion in the exhibition. The medicine pills were also treated as tesserae and reinforced the narrative of the works in their relation to illnesses such as cancer and depression. These works were developed through a conceptual strategy of appropriation that is rarely seen in mosaic making.

Original in Colour

Fig. x.16. Dawoud. *Chocolate Bar* (2015)   Fig. x.17. Dawoud. *Sweet Corn* (2015)

Fig. x.18. Dawoud. *Cancer Cells* (2015)

White Headache (2014), an earlier work by Dawoud, evidences his conceptual approach to mosaic making and his interest in the poetics of the object, a direct link with Marcel Duchamp's conceptualism. *White Headache* is an assemblage of plaster casts of human mandibles (8 units) combined with smalti, millefiori and pills (figs. x.19 to x.22). In addition to that, and a direct reference to pain, this assemblage includes four plaster casts of pill strips (fig. x.23). Like the chocolate bar, the blisters of pills offered him a found tessellation. However, his treatment of the mandibles goes a step further. Dawoud adds smalti, millefiori and some medicine tablets to the mandibles in a playful manner, emphasising the regularity of the teeth as found tesserae and andamento. Even though his work deals with the idea of pain, the associative nature of his compositions contribute to contemporary mosaic making in an experimental and informed way. Dawoud's approach is not accidental. He has been an artist since a very young age and studied art on a doctoral level. His workshops serve as a platform to disseminate his conceptual approach to art in general and mosaic in particular, exemplified in the works developed with his students.

Dawoud's achievements are recognised internationally. In 2015, together with a group of artists, he had the opportunity of representing his country Egypt in the 56th edition of the Venice Biennale with an installation work titled *Can You See?* (figs. x.24 & x.25). Dawoud describes this work as a conceptual contemporary mosaic installation, but the less informed viewer could find it hard to understand its connection with mosaic art. The work was created with wooden modular units filled with grass, arranged three-

dimensionally around the Egyptian Pavilion spelling out the word PEACE spatially. This installation at the Biennale offered the viewer the possibility of interaction through an augmented reality app that revealed clearly the word peace, the main idea behind the work. Structurally, principles of mosaic making can be found in many layers of this installation: as an assemblage of modular units, as a digital –pixelated– environment, as well as a non-visual structure associated with Marshall McLuhan's concept of mosaic. Furthermore, considering a more specific aspect of the work, it is noticeable how the strands of grass offered the artists a ready-made mosaic structure like those of the maize. The grass on its own is a mosaic surface that echoes some of the works on inclination created by the Italian group $CaCO_3$.

> The word PEACE is a mosaic of 5 letters built in a space of 19 meters wide, 8 meters deep and 2.5 meters high. Walking through this mosaic of letters, one cannot see the word PEACE without looking from high above. The visitor will walk through this mosaic of letters without really recognizing the whole scene of the word PEACE that he or she is moving through. Just like everyday life, one is so closely engaged in his particular problem that he or she does not see the "bigger picture". Similar to mosaic art in general, one can only see the beauty of the mosaic art when seen from afar (Maher Dawoud).

Maher Dawoud is a great example of how artists can experiment with mosaic making and conceptually engage with wider issues. He is one of few artists of his generation to migrate from the mosaic art circuit to the contemporary world of fine art.

Maher Dawoud was born in Cairo Egypt in 1983. He has a BFA in Mural Painting (2005), a MFA in Glass Compositions (2008) and a Doctorate in Installation Art (2013), all from the Faculty of Fine Arts, Helwan University, Egypt. Dawoud lives and works in Cairo, Egypt. He is Managing Director, Collectibles and Exhibition Department, Al Ahram Association; and a Professor, Mural Painting Department, Fine Arts Faculty, Helwan University.

Original in Colour

Figs. x.19, x.20 & x.21. Dawoud. *White Headache: Weak Mandibles* (2014)

Figs. x.22 & x.23. Dawoud. *Weak Mandibles* and *Headache Tablets* (2014)

Fig. x.24. Dawoud et al. *Can You See?* Egyptian Pavilion, Venice Biennale (2015)

Fig. x.25. Dawoud et al. Detail of *Can You See?* (2015)