ADVERTIMENT. La consulta d'aquesta tesi queda condicionada a l'acceptació de les següents condicions d'ús: La difusió d'aquesta tesi per mitjà del servei TDX (www.tesisenxarxa.net) ha estat autoritzada pels titulars dels drets de propietat intel·lectual únicament per a usos privats emmarcats en activitats d'investigació i docència. No s'autoritza la seva reproducció amb finalitats de lucre ni la seva difusió i posada a disposició des d'un lloc aliè al servei TDX. No s'autoritza la presentació del seu contingut en una finestra o marc aliè a TDX (framing). Aquesta reserva de drets afecta tant al resum de presentació de la tesi com als seus continguts. En la utilització o cita de parts de la tesi és obligat indicar el nom de la persona autora.

ADVERTENCIA. La consulta de esta tesis queda condicionada a la aceptación de las siguientes condiciones de uso: La difusión de esta tesis por medio del servicio TDR (www.tesisenred.net) ha sido autorizada por los titulares de los derechos de propiedad intelectual únicamente para usos privados enmarcados en actividades de investigación y docencia. No se autoriza su reproducción con finalidades de lucro ni su difusión y puesta a disposición desde un sitio ajeno al servicio TDR. No se autoriza la presentación de su contenido en una ventana o marco ajeno a TDR (framing). Esta reserva de derechos afecta tanto al resumen de presentación de la tesis como a sus contenidos. En la utilización o cita de partes de la tesis es obligado indicar el nombre de la persona autora.

WARNING. On having consulted this thesis you're accepting the following use conditions: Spreading this thesis by the TDX (www.tesisenxarxa.net) service has been authorized by the titular of the intellectual property rights only for private uses placed in investigation and teaching activities. Reproduction with lucrative aims is not authorized neither its spreading and availability from a site foreign to the TDX service. Introducing its content in a window or frame foreign to the TDX service is not authorized (framing). This rights affect to the presentation summary of the thesis as well as to its contents. In the using or citation of parts of the thesis it's obliged to indicate the name of the author

PLACE, SKETCH AND ARCHITECTURE.

An in-situ approach to contemporary design.

DOCTORAL THESIS

Author: SEBASTIAN HARRIS
Thesis Director: Dr. ALFRED LINARES (ETSAB-UPC)

DEPARTAMENT DE PROJECTES ARQUITECTÒNICS – DEPARTMENT OF ARCHITECTURAL DESIGN
ESCOLA TÈCNICA SUPERIOR D'ARQUITECTURA DE BARCELONA
UNIVERSITAT POLITÈCNICA DE CATALUNYA

Barcelona, May 2016

Thesis presented to obtain the qualification of Doctor from the Universitat Politècnica de Catalunya.

Acta de calificación de tesis doctoral

Curso académico: 2015-16

Nombre y apellidos Sebastian Harris

Programa de doctorado
Proyectos Arquitectónicos

Unidad estructural responsable del programa
ETSAB - UPC

Resolución del Tribunal

Reunido el Tribunal designado a tal efecto, el doctorando / la doctoranda expone el tema de la su tesis doctoral titulada:

Place, Sketch and Architecture. An In-situ Approach to Contemporary Design.

Acabada la lectura y después de dar respuesta a las cuestiones formuladas por los miembros titulares del tribunal, éste otorga la calificación:

☐ NO APTO ☐ APROBADO ☐ NOTABLE ☐ SOBRESALIENTE

(Nombre, apellidos y firma) Presidente/a	(Nombre, apellidos y firma) Secretario/a

(Nombre, apellidos y firma) Vocal	(Nombre, apellidos y firma) Vocal	(Nombre, apellidos y firma) Vocal

_____, _____ de _____ de _____

El resultado del escrutinio de los votos emitidos por los miembros titulares del tribunal, efectuado por la Escuela de Doctorado, a instancia de la Comisión de Doctorado de la UPC, otorga la MENCIÓN CUM LAUDE:

☐ SÍ ☐ NO

(Nombre, apellidos y firma) Presidente de la Comisión Permanente de la Escuela de Doctorado	(Nombre, apellidos y firma) Secretario de la Comisión Permanente de la Escuela de Doctorado

Barcelona a _____ de _____ de _____

RESUMEN

Esta tesis analiza cómo el croquis in-situ puede profundizar la conexión entre la arquitectura y el lugar en todas las etapas del proceso proyectual. La primera parte considera cómo el croquis in-situ puede estructurar las percepciones de lugar, subjetividad y tiempo, integrándolas en el proceso creativo. La segunda parte investiga las relaciones conceptuales subyacentes entre los dibujos de viaje y bocetos de proyecto a través del análisis comparativo de los dibujos de Le Corbusier y Alvaro Siza. En la tercera parte se utilizan los croquis del propio autor para examinar las complejas relaciones entre el lugar y los bocetos de proyecto centrándose en las siguientes obras: la Acrópolis, Can Lis (Jorn Utzon) y el Mercado de Santa Caterina (EMBT). La cuarta parte presenta estos argumentos teóricos en un cuaderno de bitácora, trazando una secuencia de relaciones interconectadas entre la arquitectura y el lugar utilizando ejemplos de todo el mundo. Se utilizan bocetos y diagramas del autor para argumentar cómo el croquis in-situ es un proceso mental complejo que combina la observación de la realidad con el proceso proyectual. Además, el croquis in-situ construye una comprensión estratificada del lugar y del tiempo que forman la base esencial del pensamiento y diseño arquitectónico.

Palabras Clave: Dibujo in-situ; Croquis de proyecto; Dibujo de viaje; Lugar; Proyecto arquitectónico; Alvaro Siza; Le Corbusier; Acropolis; Mercado de Santa Caterina; Can Lis.

ABSTRACT

This thesis analyses how sketching in-situ can deepen the connection between architecture and place throughout all stages of the design process. Part one considers how in-situ sketching can structure human centred perceptions of place, subjectivity and time, integrating them positively into the creative process. Part two investigates underlying conceptual relationships between travel drawings and design sketches through comparative graphic analysis of the sketches of Le Corbusier and Alvaro Siza. In part three, the author's own in-situ sketches scrutinise the complex and contrasting relationships between place and architecture focusing on the Acropolis, Can Lis (Jorn Utzon) and Santa Caterina Market (EMBT). Part four presents these theoretical arguments as a graphic logbook, charting a sequence of interconnected relationships between architecture and place from around the globe. The author's sketches and diagrams are used to argue how in-situ drawing involves a complex thought process which combines observation of reality with the design process. It constructs a layered understanding of place and time, forming the essential basis of architectural thought and design.

Keywords: In-situ sketching; Design sketching; Travel sketching; Place; Site specific architectural design; Alvaro Siza; Le Corbusier; Acropolis; Santa Caterina Market; Can Lis.

ACKOWLEDGEMENTS

Of the many influences which have shaped this thesis, I would like to thank my advisor Prof. Alfred Linares for his guidance during the last few years. For comments which have gradually clarified my own thoughts and allowed them to develop freely along their own course. For stimulating discussion of the ideas behind a great breadth of architectural references.

My sincere thanks Prof. Estanislau Roca who has provided many interesting discussions which have provided a cross-discipinary view on drawing linking the scale of the individual project to that of the city. In addition, his expertise in both theory and practice has helped me to see the overall implications of my thesis across education, research and design. It has been a great pleasure to illustrate parts his book Walking the City and his overall encouragement has been of invaluable assistance in the later stages of the PhD.

Many have shared the conviction that drawing matters to architects and that its real importance is far greater than that usually expressed in simple terms. I am particularly grateful to Prof. Anna Martinez for adding critical reflection to my habit of drawing, for helping to investigate why drawing helps architects,

transforming a practice into a line of investigation. Also for giving me the opportunity to spend two weeks researching Can Lis in-situ.

From the applied side of drawing, Pepe García Navas has helped me to see through the apparent divide between the artistic practice of drawing and the architectural thought which lies beneath its surface.

During the course of the thesis, brief conversations with several architects have turned out to be disproportionately significant to this thesis, in particular those with Josep Llinás, Pep Quetglas, Carles Muro, Kenneth Frampton, Ricardo Daza, Jordi Ros and Fernando Pérez Oyarzun during his time at Cambridge.

I have also had insightful comments from the Professors in Projects Department at the UPC: Prof. Felix Solaguren, Jaime Ferrer and from the urbanist Ferran Sagarra.

I would like to thank Prof. Terradas at La Salle School of Architecture, where I did my Masters and currently teach, for his determination to invigorate drawing within architectural education. Along with a number of colleagues there who share a similar appreciation of the conceptual and practical assistance that sketching can offer design.

I am also grateful to Juan Carlos Dall'Asta, from the Politecnico de Milano, for his suggestions, references and improvements to the final draft.

Richard Sennett writes that a craft takes 10,000 hours to master. The kind of drawing discussed here takes time. I am particularly grateful to my family for encouraging me to keep drawing, and Anna especially for offering a different perspective on it all.

Drawing, and the thinking it involves cannot be separated from its instruments of support. Beyond the various instruments which one becomes strangely attached to after some years, Symphony, a sailing yacht, has been instrumental in stimulating my awareness of place, in both emotional and very practical terms. Journeys by sail have cultivated all the attitudes and approaches I believe are essential to travel drawing.

TABLE OF CONTENTS

ABSTRACT *4*

ACKNOWLEDGEMENTS *6*

NOTES ON THE THESIS *10*

THESIS STRUCTURE *12*

INTRODUCTION *21*

PART I

The uniqueness of drawing *47*
Ch.1: Place *53*
Ch.2: Subjectivity *63*
Ch.3: Time *83*
Summary *99*

PART II

Analysis & design: Travel drawing and design sketch as a single process *103*
Ch.4: The Acropolis sketches, Le Corbusier *119*
Ch.5: Unite d'Habitation, Le Corbusier *157*
Ch.6: House in formentor. Alvaro Siza *185*
Summary *211*

PART III

Project, place and sketch *215*
Ch.7: Comparing points of view, Le Corbusier, S Harris *223*
Ch.8: Can Lis. Jorn Utzon *261*
Ch.9: Santa Caterina market, EMBT *307*
Summary *375*

PART IV

Logbook / Cuaderno de Bitacora *379*

CONCLUSIONS

..... *460*

BIBLIOGRAPHY

..... *483*

THESIS SUMMARY

..... *499*

NOTES ON THE THESIS

Bibliographic Style

This thesis uses the Harvard System of Referencing, whose manual can be consulted at the Guide to the Harvard System of Referencing, 5th edition, published by the Anglia Ruskin University and the online version can be found at: http://libweb.anglia.ac.uk/referencing/harvard.htm. A summary has also been provided by the UPC's library at: http://publica.upc.edu/es/estil/bibliografies.

Abbreviations

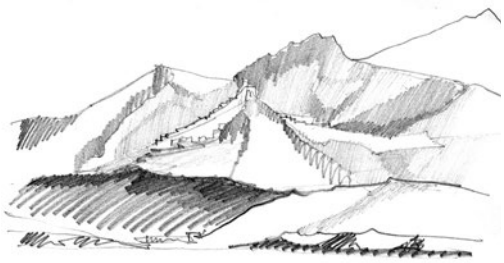
The name of the author of each illustration is written between brackets in the captions. Le Corbusier is abbreviated to "LC".
Enric Miralles Benedetta Tagliabue Architects and abbreviated to EMBT.
Sketches and diagrams by the author of the thesis are referred to by "SH".

Illustrations

Le Corbusier's 1911 sketches of the Acropolis, Athens have been taken from pages 98 to 127 of the third sketchbook from his Voyage to the East, published in facsimile: Corbusier, L., 1988. *Voyage d'Orient: sketchbooks*, Volume 3, Rizzoli.
Unless stated otherwise, all images are by the author, Sebastian Harris

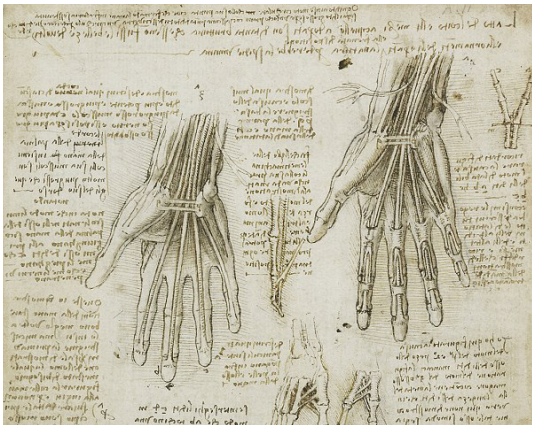
Thesis Structure

Part I: The Uniqueness of Drawing
On which aspects of drawing make it unique and useful in the current context of architectural practice, education and research.



Ch 1. Place - on how sketching in-situ connects the sketcher to place revealing its underlying nature through the practice of embodied drawing.

Fig. 1: Three sketches of Serifos, Greece. in different media and at different dates. (SH, 2004, 2004, 2014)

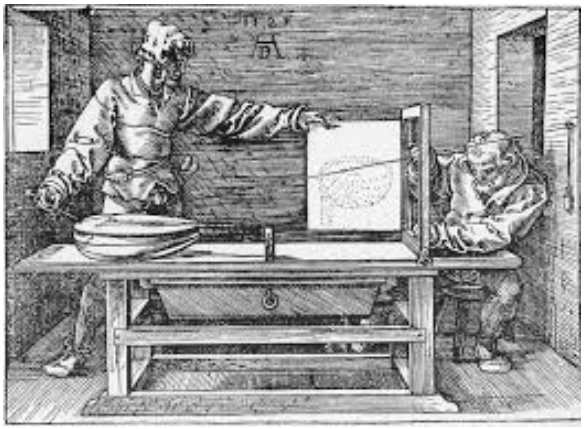


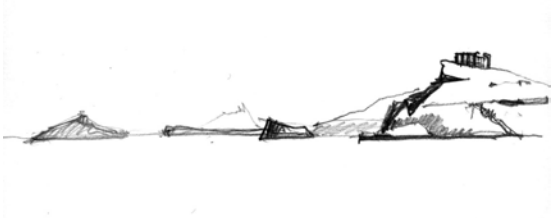
Ch 2. Subjectivity – on how sketching can take advantage of the sensitivity, intuition, creativity and originality that subjective point of view can offer. The practice of sketching also serves to record control and to some degree rationalise subjective thought.

Fig. 2: FROM LEFT: Anatomical drawings (Leonardo da Vinci); Perspective drawing (Durer); Artist drawing a model knitting (Picasso)

Ch 3. Time – on how the sketch as an artefact affects the appreciation of time and how time influences its interpretation. On how the process of sketching influences the perception of time in place and through the temporal construction of the drawing.

Fig. 3: Three sequential sketches of Cape Sounion, Greece. Drawn from a moving viewpoint. (SH)





Part II: Analysis and design: Travel drawing and design sketch as a single process

Connecting travel sketching and design sketching as part of one single propositional practice influenced by the reality of place and context.

Ch 4. Graphic analysis of how Le Corbusier used travel sketching to learn about architecture and place, using the example of his Acropolis sketches from the Voyage to the Orient, 1911.

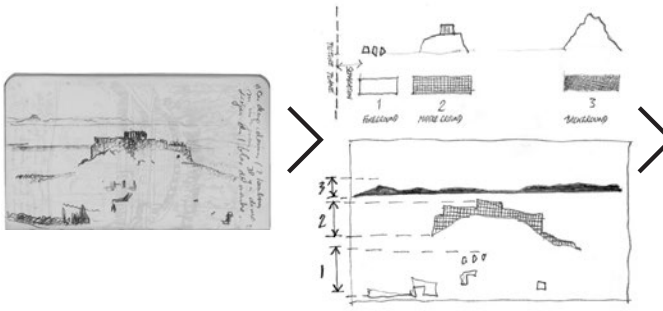


Fig. 4: Comparative graphic analysis of Le Corbusier's sketches of the Acropolis, Athens from 1911. (SH)

Ch 5. Comparative analysis of the ideas Le Corbusier developed through sketching the Acropolis with the design ideas behind one of his much later projects. Comparing the Acropolis sketches with the author's own sketches of the Unité d'habitation in Marseille

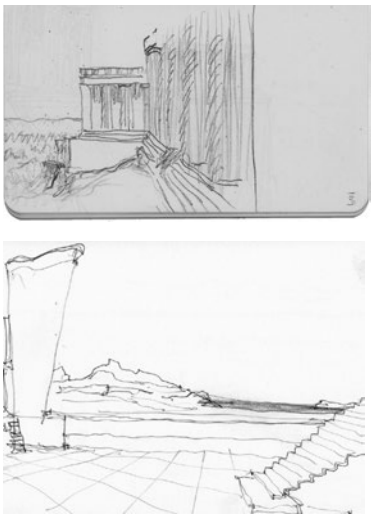
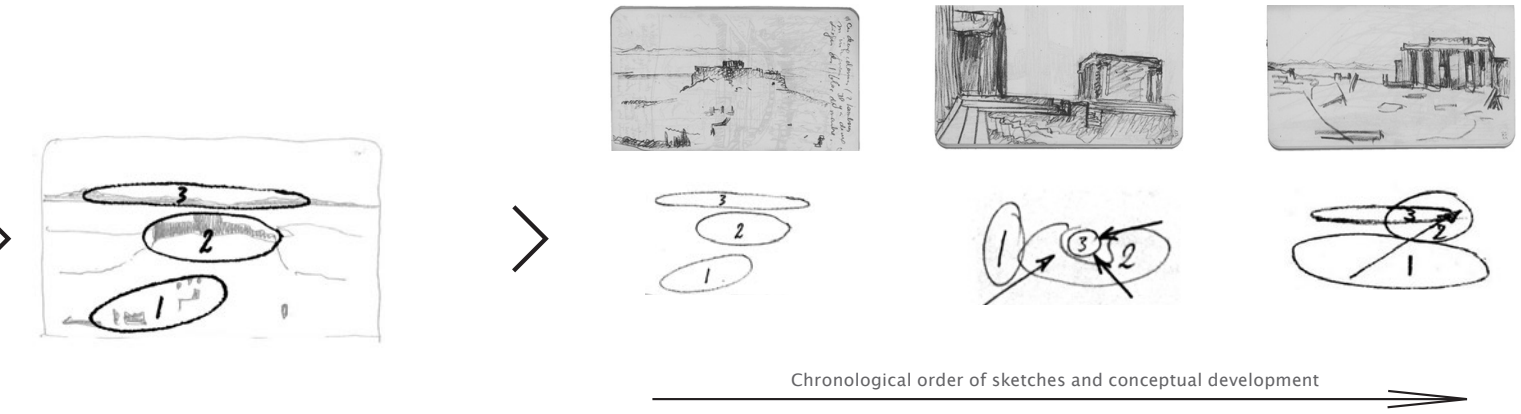
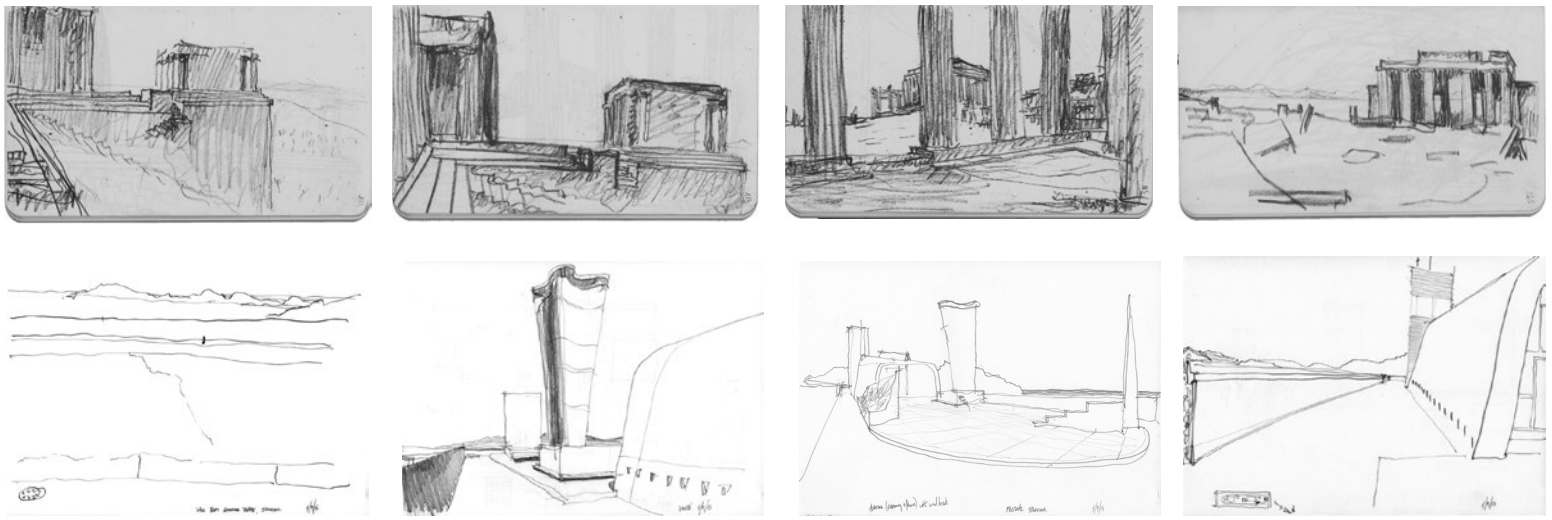


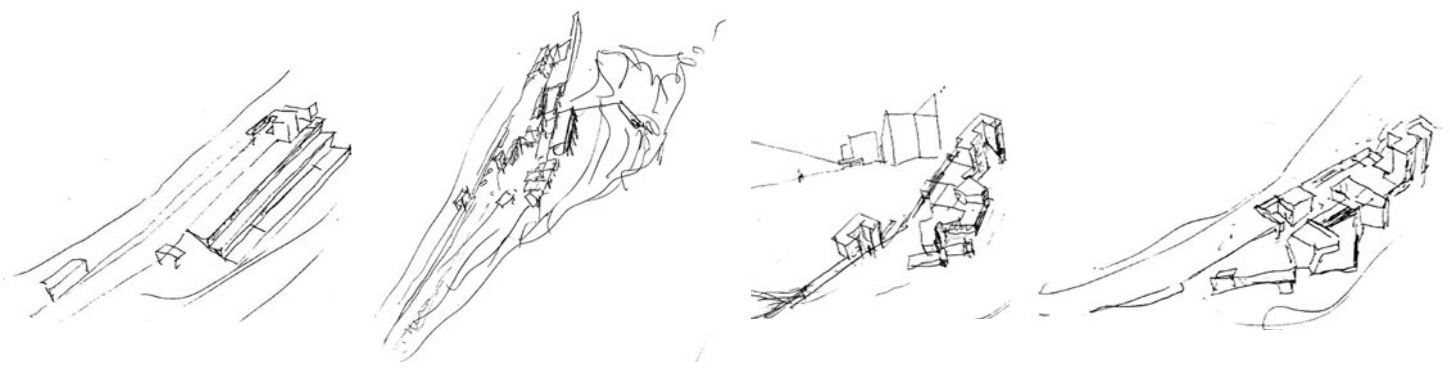
Fig. 5: Comparison of Le Corbusier's sketches of the Acropolis, Athens with his design of the Unité d'Habitation, Marseille. (drawn by SH)

Ch 6. Comparative analysis of a continuous set of site sketches and design sketches for Alvaro Siza's design of a house in Mallorca. These show the continuous influence of site sketches throughout the design process, increasing its connection to place.

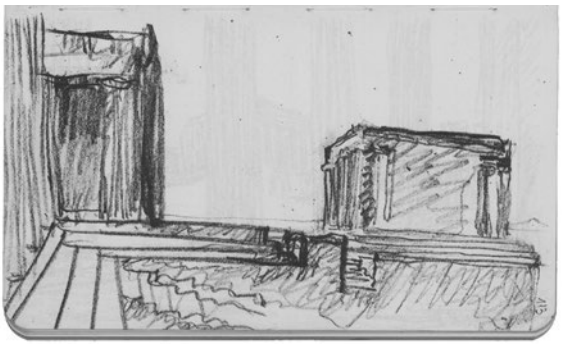
Fig. 6: Sequential analysis of Alvaro Siza's site and design sketches for his project in Formentor, Mallorca. (Siza, 2005–6)


3
2
1
Chronological order of sketches and conceptual development





Part III: Project, place and sketch
Using drawing in-situ to apply the ideas discussed above, to the analysis of built projects with widely contrasting approaches to place.



Ch 7. Explaining the author's point of view through comparison of a set of sketches of the Acropolis with those of Le Corbusier previously discussed.

Fig. 7: Comparison of Le Corbusier´s sketches of the Acropolis with those by the author. (SH)

Ch 8. Detailed in-situ sketch analysis of Utzon's first house on Mallorca, Can Lis, examining how the design of the project relates the building to place and context. Both project, a single family house, and site, a natural previously unbuilt cliff top, are relatively simple.

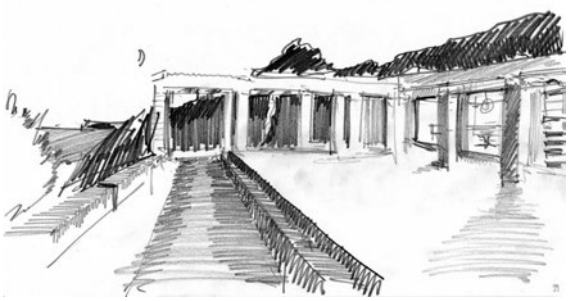
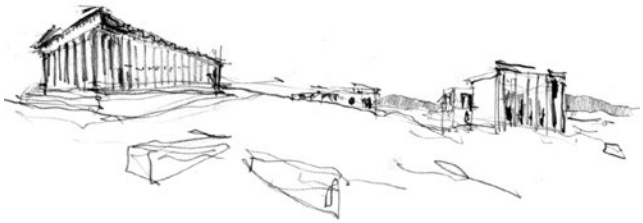
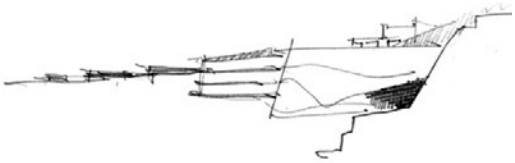
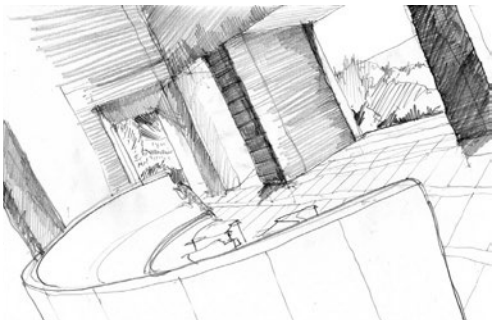


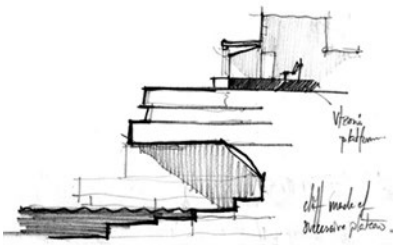
Fig. 8: In-situ sketches and analysis of Can Lis, Jorn Utzon's first house on Mallorca. (SH)





to approach




Viewing platform
cliff made of
different plateaus.

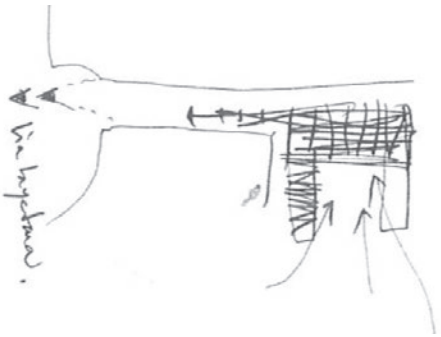


Fig. 9: Design sketch diagrams for Santa Caterina Market, Barcelona (Enric Miralles, 1995); In-situ sketch sequence; sketch analysis of time and place (SH)

Ch 9. Detailed in-situ sketch analysis of a complex, recent project in a complex ancient place. Analysing the reformation of Santa Caterina market by EMBT and its interaction with the surrounding city scape and its multiple and varied users. The results of the analysis are compared back to the original design drawings and intentions of the architects.

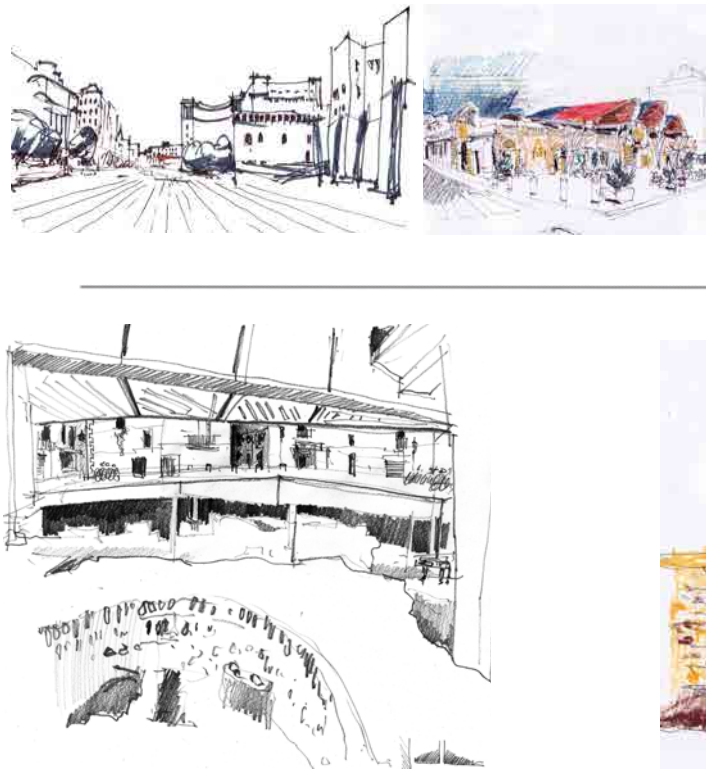
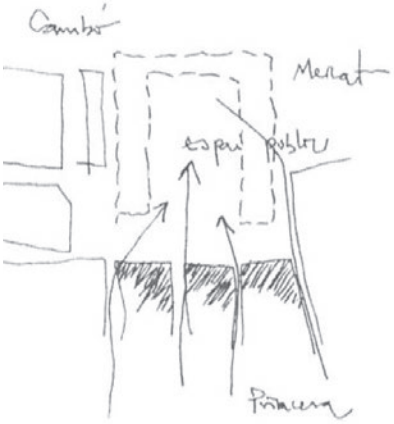


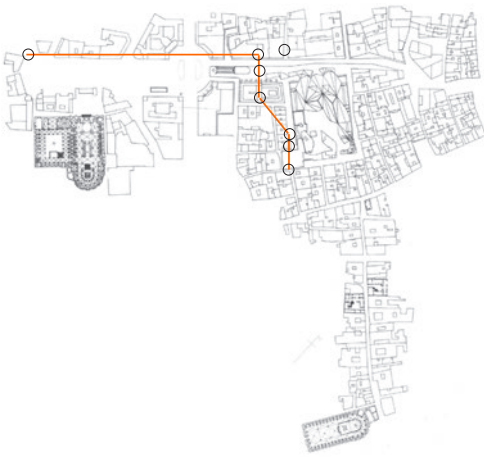
Fig. 10: In-situ sketches of Shanghai, Paestum, Alvaro SIza's tea House near Oporto, and urban regeneration project for Badalona, Spain (SH)

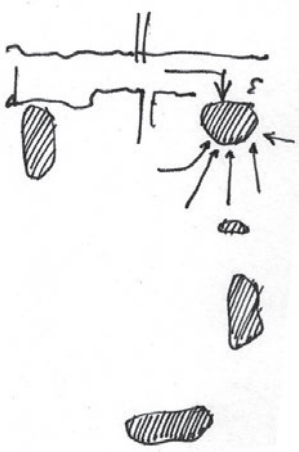
Part IV: Log book / Cuaderno de Bitacora

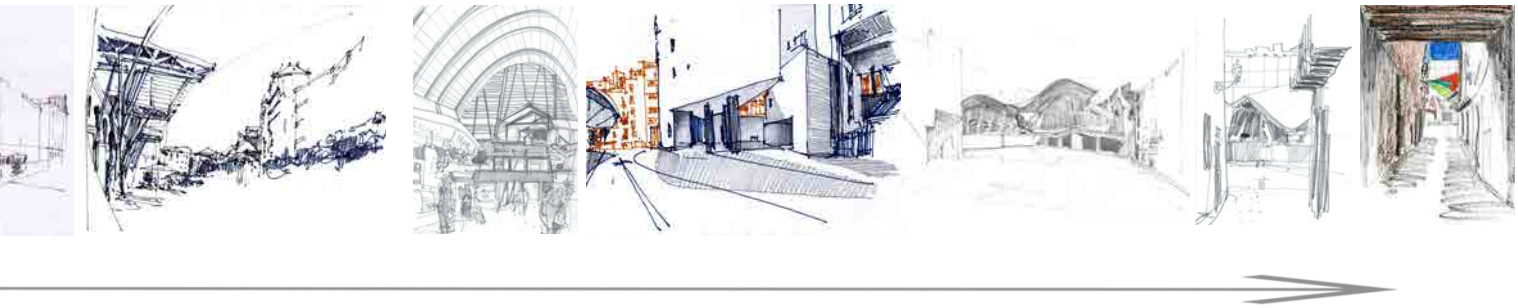
Composing a graphic argument linking themes from the first three parts across a combination of details, projects, cities and landscapes Place is the constant theme which is revealed and treated in different ways, each sketch relating to those before and after in the manner of sketches drawn consecutively in a travel sketchbook.

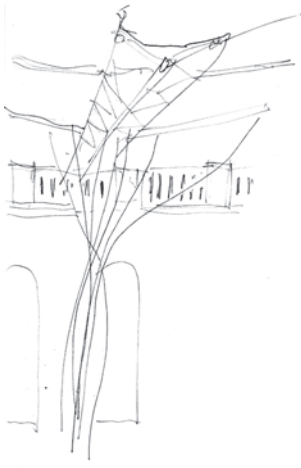
Conclusions

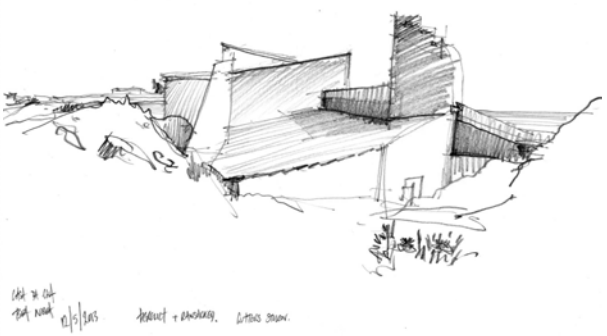

Cambó
Mercat
espai públic
Plaça











INTRODUCTION

Background

1 - The importance of place

In 2011, Kenneth Frampton stated that the most pressing issue of all for contemporary architecture is to re-establish its connection with place. In his lecture, *Architecture and Vanguard*, Frampton spoke of the ancient interrelationship between architecture and place, which in much of the world is being steadily eroded by the onset of globalisation, and the homogenous and mediocre mass-culture which it is spreading across all corners of the globe. Whatever methods may be used for its design and production, Frampton ardently believes that place lies at the very essence of architecture, and must therefore be a constant determining factor throughout the process of design. Such views are not new, building upon an explicit tradition which may be traced back to the nineteenth century and which has been implicitly the case since the first man-made buildings. Frampton himself wrote a highly influential essay on the subject of place specific architecture which he termed Critical Regionalism, first published as a chapter of his *History of Modern Architecture* (Frampton, 1981). He noticed that as Modernism progressed during the course of

the twentieth century, the question of place became increasingly significant. Despite the reduction of architecture to the efficient rational minimum, advances in mass production and the widespread capability to artificially overcome local environmental characteristics, Frampton saw that a principle criticism of much early Modernism was that it lost its connection to place. With industrial progress, this connection between architecture and its locality has been increasingly forgotten – a trend which has only intensified in the digital era. Globalisation has spread, as Frampton puts it, a version of the same mediocre culture around the world. In response to the ever increasing strength of globalisation, Frampton now insists that the importance of place in architecture is becoming more vital than ever. He urges architects to relate their designs to the specific qualities of place – climate, culture, material or any other way in which buildings may establish deeper relationships with their context (Frampton, 2011).

From the architect's point of view it is therefore necessary to understand what it is that distinguishes one place from another, and to be able to evaluate the potential that these distinct characteristics may have to improve the quality of places through architectural design. These characteristics are often explained with remarkable clarity through sketching in-situ, a complex but low-tech means of analysis. From my own experience of travel sketching, I notice that the comment which arises most frequently about my sketches refers to sense of place. It seems that travel sketching is particularly sensitive to observing place, and equally effective as a means for expressing an individual interpretation of it. In basic terms, travel sketching, may be explained as sketching in-situ, whether travelling or merely outside of one's usual working environment, which is principally based upon the subject matter of one's surrounding environment.

To summarise, this thesis has been motivated by the increasing importance of basing architectural design on the specificities of place, the current moment of transition in methods of architectural representation and design with the critical influence this may have on the profession, research and education.

2 - Evolving traditions of drawing in architecture.

Drawing has formed a crucial part of architectural design since the early Renaissance, but during that time its precise role within the design process has varied. In recent years, with the develo-

pment of new technologies and the general decline in the use of sketching in architecture, the accepted role which drawing by hand has played throughout the modern era in particular is no longer as evident. However, changes in the general culture of architectural production give sketching, and particularly in-situ sketching, new relevance through its potential to improve the connection between place and architectural design. In *The Craftsman*, Richard Sennett explains the training of the apprentice at various moments in history (Sennett, 2008). The purpose was to transform new and conscious skills into tacit ability, a process which was long and necessarily repetitive. Once mastered, the skills of the craftsman become internalised to the degree that the craftsman need no longer pay rapt, conscious attention to the primary task but is sufficiently in control to be able to pay attention to the subtleties of the work. Likewise with drawing, until relatively recently, drawing was a necessary and unavoidable part of architectural education and practice. Consequently the skills of drawing were generally mastered to the point that drawing was often a relatively natural practice. One which allowed thoughts to appear, develop and be expressed without excessive, all consuming concentration on the manual coordination necessary to make the appropriate marks on the page. This liberation from the limitations of basic technique meant that drawing was in general an extremely effective and straightforward medium for thought and expression. Needless to say, without the necessary, or often obligatory hours of practice, the level of skill required for sketching to become a useful aid to thinking, rather than just a slow hindrance, is rarely reached.

The gap between those who find sketching a useful practice in architecture (both design and research) and those who do not, is linked to this tacit ability (fluency to think with the pencil), and tacit ability is linked to the hours of practice. Consequently this divide corresponds largly to the change in generation between when sketching was an architectural requirement, and when modern, technological "alternatives" appeared. Another observation from the classroom is that whilst more senior teachers regularly pronounce the significance of sketching, few go to the lengths of clearly explaining why. As a result, their championing of the sketch is often perceived as dogma reminiscing about the past. This can often have a counter reaction with detrimental effect for the encouragement of students to persevere with drawing. As a result, architectural students, unless actively encouraged, are less likely to resort to drawing in-situ on a site visit than they would have been some decades ago.

This is not to say that drawing in architecture is outdated. The Yale symposium, *Is Drawing Dead?*, in 2012 concluded that drawing may take new forms but that it is still an extremely relevant part of architectural practice (YSoA, 2012). Sketching in-situ has also reappeared in different parts of society, apparently filling a gap left by alternative technologies. The growth of online communities such as Urban Sketchers1 demonstrates this desire across society to connect with their environments through drawing in-situ. Nevertheless, so far this renewed enthusiasm has had little effect on architecture schools.

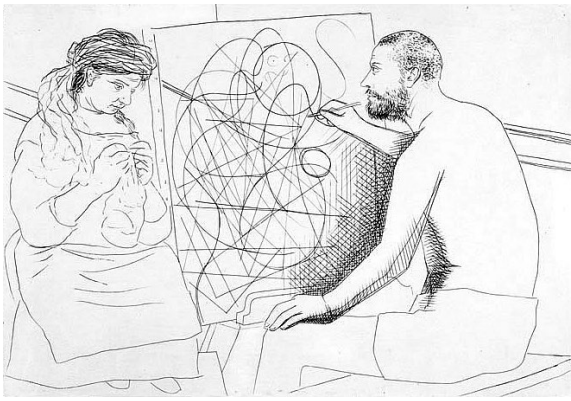


Fig. 11: ABOVE: Artist and model knitting (Picasso, Print, 1927).

In general terms, currently sketching is still seen as significant in architecture and is to some degree being re-valued for the benefits it holds over other, more convenient alternative modern technologies. This reconsideration of its value after years of decline following the adoption of new technologies has still to enter the majority of architecture schools whose focus currently lies on other techniques for developing the architectural design process. Nevertheless, there is great potential for certain forms of drawing, particularly sketching in-situ, to enrich many aspects of architectural design, fulfilling areas of the design process left largely vacant by new technologies.

Consequently, this thesis re-evaluates sketching in architecture specifically through focusing on how it can fuse together the analysis and design of architecture and place. The argument presented aims to uncover ways that sketching may be of most relevance to modern design, and how it may be used to its best advantage in the architecture of the future. It considers that architectural sketching is at a point of transformation, not extinction, but neither necessarily of hybridisation with computer technologies.

A combined approach to sketching and place

The following thesis considers how in-situ sketching may provide a way in which these two concerns may be combined and jointly resolved. Drawing in-situ can incorporate both place analysis and architectural design into a single graphic project, thereby fusing place and design together. At the same time, shifting the role of architectural hand-drawing in the design process towards questions of place may inject new life into a diminishing tradition of architectural thought. Furthermore, given the capacity of architectural travel sketches to uncover, explain and de-

velop the highly specific qualities of place, if incorporated intelligently into the architectural process it may also serve to bridge certain gaps, such as the interrelation between architecture and place which technological advance has opened up. The argument starts from the intuition that travel sketching is important to architects firstly because it helps them to understand what makes different places unique, and secondly that a better understanding of place is likely to help design projects which enhance and improve these qualities. The motivation for this thesis is not only about how travel sketches can capture a sense of place, but more importantly how travel sketches can help the specific aspects which create this unique quality to be translated into new design. This thesis therefore considers how these two ideas about place and in-situ sketching may be combined and developed into new strategies for the architectural design of the future.

In order to understand how in-situ sketching may help design work, it is worth considering the relationship between the in-situ sketch (or travel sketch) and the design sketch. Design ideas which are developed through the use of design sketching share much in common with ideas about place uncovered through sketching in-situ. Travel sketch and design sketch are often considered distinct activities which is often explained by the primary stimuli of the sketch being principally external (from the surrounding environment) or internal (from the designer's imagination). A print by Picasso serves to make this distinction less clear (Fig. 1). Whether a drawing is observed directly from reality or not, the maker of the drawing inevitably represents an interpretation of it. This is more than a translation from three dimensions to two, it involves a mental process of analysing the view and proposing ways to represent it through controlling the marks on the page. Whether intentional or not, this process shares much in common with the imaginative process of design sketching. A travel sketch by Louis Kahn illustrates the same idea (Fig. 2). The travel sketch is not necessarily just a pictorial representation of the scene in front of the artist, but becomes a work of design in its own right. The final image is determined as much by Kahn's imagination as it is influenced by the view he was drawing (Hochstim, 1991).

Fig. 12: BELOW: The Athenian Acropolis and Temple of Jupiter (Louis Kahn, 1951)

The thesis therefore investigates how and why this works and what potential it has for architects of the future. The degree to which a travel sketch is a depiction of reality or a work of design imagination varies with the drawer and the sketch. Although this investigation does not attempt to classify or compartmentalise

sketches into specific types, these two intuitions – that sketches are especially sensitive to the nature of place, and that a travel sketch may contain as much design as observation – suggest that sketching in-situ has great potential to help architects intending to design buildings which relate to a specific place. Considering Frampton´s claim for the ever increasing urgency for place to form the fundamental basis of architectural design, together with the substitution of hand crafted techniques for digital ones throughout all stages of architectural production, the argument behind this thesis has been motivated by the idea that a practice as traditional, low tech and accessible as freehand sketching should be reexamined to answer these issues.

Research Questions

Three main questions are asked in order to understand how this may be achieved and explained. What makes sketching unique for helping architects to design place? What is the relationship between travel sketching and design sketching. How can the results of these two questions be applied in contemporary architecture and research?

In outline this research suggests the following answers which are explained more fully in the following chapters:

Part I finds that sketching in-situ involves a particular interaction with place, subjective thought and time. Both the process of sketching and the sketch itself can help architects to understand the complexity of place and visualise its transformation through a design proposal. Sketching can help to guide the design process in order to connect it more thoroughly to place.

Part II demonstrates that architectural sketching in-situ and design sketching can form part of the same continuous process. Architectural ideas may maintain this connection even though travel sketch and design project may be separate in both time and location.

Part III applies in-situ sketching as an approach to researching the relationship between architecture and place. This shows how sketching may be used effectively to research existing precedents as well as providing a process to tie place and project together during the design process. Sketching in-situ, through combining research and design may be of immense use in archi-

tectural education far beyond simple graphic illustration of the built environment.

Method.

These questions are approached through using drawing to investigate and propose answers. Sketching is used throughout the following arguments not only to illustrate ideas and express conclusions, but as the essential method of investigation underlying each aspect of the research. The graphic and written arguments are developed together in parallel throughout the course of the thesis. The sketches of the great architects of the last century are most relevant to architectural design today for what they reveal about the way in which they were made, and the processes of thinking which this followed. Sketching is important for the sequential build up of ideas that it involves rather than just for the choice of elements to omit or include. These arguments focus on analysing the process of sketching more than the static end result of each sketch. Therefore, to understand this process of creation, the most appropriate method is to use the same kind of sketching to recreate and analyse the construction of the original drawings. As a result, sketching is not only the subject matter of the thesis, but forms the method through which the thesis develops. The thesis is drawing, not just about drawing.

There is a distinction between the approach of drawing in-situ and the method of graphic analysis which deconstructs original sketches and investigates using sketch diagrams. Therefore different methods and approaches are used in different parts of the thesis according to the specific intention of each section. Part I uses a written critical discussion of theoretical ideas about sketching drawn from varied sources. Part II uses a method of graphic analysis to investigate in detail the historical sketches of Le Corbusier and recent site and design sketches by Siza. Part III applies an approach equivalent to those discovered in the examples of part II using sketching in-situ to investigate place through first hand experience and creation.

1 - Graphic analysis.

It is interesting to analyse architects' sketches for two main reasons: First, in order to understand what has been drawn – what mental conception has been under construction. This may only

be built up from fragmentary glimpses offered by aspects of a sketch or sketches. Second, to understand why this mental image has developed the way it has, in other words to discover in the sketch what were the reasons behind the many decisions made during the drawing. This requires architectural knowledge and can be investigated most clearly through comparing how particular aspects change and evolve across a series of variations.
The technique usually adopted in the majority of the literature is direct visual interpretation using a written commentary to bring attention to certain aspects of the drawing under scrutiny. However this often remains on a descriptive level, and those accounts which provide more analysis usually require lengthy written description to make this clear. In contrast, the method of graphic analysis used in Part II is based upon graphic methods used by Darcy Thompson (1917) and Bacon (1976). Similar methods are used in the work of Quetglas (2009) and the thesis of Victor-Hugo Velazquez (2012). It can show the direction and magnitude of change if drawings are in sequence. It shows the relative value of particular features and the forces they react or respond to. They can show the intermediate steps and help to reveal how ideas evolved. They can suggest where different forces have come into play such as the role of external influences. Comparative analysis therefore needs a form of representation equivalent to the subject being studied. The decision to explain findings using freehand sketch diagrams reflects the type of drawings and intended degree of precision considered most appropriate to the drawings analysed. The explanatory diagrams of Eisenstein such as those used to explain Choisy's theory of movement through the spaces of the Acropolis are taken as a reference (Eisenstein, 2001) (Fig. 34). Explanations of how sketching may serve an educational method are described through the cognitive research by Goldschmidt (1991, 2003), Schon and Wiggins (1992) amongst others. The practical application of sketching as a means to develop design in the classroom has been used extensively throughout the modern era to recent times. Coderch, Roqueta, Torres and Garcia Navas are amongst many professors at ETSAB who have insisted on the importance of drawing during design.

Having broken down the original drawing into these basic regions, selecting which are of particular relevance to the issue in question, various comparative techniques are used to understand the reasoning behind the drawing in question. This reveals two particular characteristics: the direction of change, and the magnitude of change. If these two questions can be recorded, then it may be possible to trace where and why the changes oc-

cur. In the case of in-situ sketches this may suggest reasons why certain decisions are made at particular moments in reaction to particular stimuli and how this all affects the mental image of the sketcher in-situ. The magnitude of changes between sketches may show the relative significance given to one particular idea or another. Diagrams are used to reduce complex images down to individual concepts. Although highly simplified and reduced back to individual ideas, these conceptual diagrams allow one to clearly observe how sketches transform with the ideas behind them. Although concept diagrams may be enlightening in their own right, when compared with other similar diagrams they can reveal how the ideas behind the sketch are changing. The sketch is both the result of this change but also the generator of it.

2 - In-situ sketching

Rather than a method as in the case of graphic analysis, in-situ sketching is a process which is an extension of the design process. The architect's in-situ sketch to some degree designs rather than captures the view in front. Therefore, although it shares certain points in common with parts of a scientific method, architectural sketching is better understood as an iterative process with a particular approach to observing, interpreting and reacting to a surrounding environment. Sketching is personal, subjective and contextual, all of which make it extremely useful as a means for architects to both analyse and interpret their surroundings. Drawings may go through many variations, evaluating and improving on the previous stages. But even this process of gradual refinement is not necessarily linear, taking instead the unpredictable route of the design process. It does however provide a means of evaluating and responding creatively to one's surroundings. This may be rigorous in terms of the depth of observation and the refinement of the ideas. The process is open-ended, each step may lead off in any unforeseeable direction at any moment.
The advantage of this kind of place analysis for the architect is that it has been developed through the same means as the design process itself. Being created through the same medium helps either the conclusions drawn from it to fuse directly into a project designed to stand on the location of the site sketches, or else to remain latent at a less immediate level and gradually seep into designs far later on.

Specific objectives and structure of the argument

The thesis is structured in four parts followed by a final conclusion. First, three principal ideas which distinguish sketching in-situ from current alternative media are discussed: place, subjectivity and time. Second, a method of detailed comparative graphic analysis is used to analyse some of the most influential travel and design sketches of the 20th and 21st centuries. Third, the author's in-situ sketches are used to apply this approach of propositional site sketching to modern and contemporary projects which interact profoundly with contrasting types of place. Fourth, a graphic logbook of the author's sketches concerning different ways in which architecture and place interrelate, restates the arguments presented in the first three parts. The thesis concludes with observations on the changing relevance of drawing in architectural design research and education, proposing the area of place sketching as a primary focus for drawing and designing place in the future.

Part I, *The uniqueness of Drawing.* This is a theoretical discussion of three themes of particular significance in contemporary architectural design which distinguish sketching in-situ from current alternative media: place, subjectivity and time. Each has an important influence on the design process which can be positively affected by drawing. It presents a series of arguments concerning how sketches and the process of sketching interact with these three main issues. Through considering in detail what relationship exists between in-situ sketching and each of these topics, the argument explains how sketching can help the architect to understand and to some degree control the role which these three aspects play within the design process. This creates a theoretical framework to consider how in-situ sketching can guide the complex interrelationship between architect, project and place. These ideas are then built upon in the following discussion first of historical drawings and projects, and then in the analysis of recent and contemporary projects and places.

Part II; *Analysis and design:* Travel drawing and design sketch as a single process, comprises first, an analysis of how in-situ sketching has been used productively in the past to analyse the relationship between architecture and place. The connection between the in-situ, or travel, sketch and design sketch is examined through analysing the sketches of significant modern and current architects and then evaluating their influence on their built work. Techniques of graphic analysis are explained and employed to

uncover the processes of thinking behind them. Le Corbusier's travel sketches of Athens from 1911 are analysed in depth to show how the architect used in-situ sketching to help discover and develop his forming ideas about the Acropolis. This shows both how Le Corbusier used his drawings as an investigative approach to a well-known precedent, but also how these drawings trace his experimental process of trying out different ways of seeing elements of Classical architecture and their relationship to place.

The next chapter considers what affect this in-situ analysis may have on later design work through comparing Le Corbusier's sketches of the Acropolis to the design of the Unité d'habitation in Marseille. This shows how the ideas which were still forming in the Acropolis sketches, over forty years later became the conceptual basis for many aspects of the later project. This process of transformation from antecedent into a new project and place is examined further in the following chapter. The connection which this establishes between in-situ sketching and project design, is then cross-referenced to a recent equivalent where in-situ sketches and design sketches overlap forming a continuous process of design commencing with drawings made on site. The site and design sketches for the house in Formentor by Alvaro Siza are analysed in detail. This shows the influence of the initial in-situ sketches throughout the design process, and demonstrates the positive affect this had on strengthening the connection between the project and it site throughout the design process. Part II makes use of a method of detailed graphic analysis of Le Corbusier and Siza's travel and design sketches.

Part III, *Project, place and sketch*, applies the approaches discussed in the previous section to two modern and contemporary projects which interact profoundly with place. A comparison of the author's own sketches with Le Corbusier's Acropolis sketches explained in Part I, serves to state the author's point of view giving a clear starting point for the following analysis. Buildings by Utzon and Miralles, in radically different places, are investigated using the author's own in-situ sketches to analyse the interaction between these projects and places. This approach has the advantage that all observations are taken from direct in-situ experience as focused and expanded by sketching, with minimal reliance on secondary sources. This uses drawing to extract interpretations from the graphic record of my own in-situ experience, leading to original interpretations of the relationship of these projects with place. These are subsequently compared to both original design

material and other research opinions. This shows how sketching in-situ can reach original conclusions about complex changing interpretations of well documented architecture.

The fourth part, *Logbook* (Bitacora), is a review of the principle ideas considered in the thesis, organised in purely graphic form in the manner of a sketch book built up over the course of several years of travel and research, extending these ideas to a broad range of buildings and places. This is based upon "Excursus" in Colin Rowe's Collage City. This is organised in the sequential manner of a travel sketchbook, but structured in thematic rather than chronological order. The sequence of drawings is structured by a thread of ideas on architecture and place which gradually unravel through the sketchbook linking from one to the next. This builds on the arrangement of Warburg's "Mnemosyne Atlas", as well as the visual argument in Enric Miralles' thesis (Moneo, 2012), and the composition of Calvino's "Invisible Cities".

Each Part reaches its own specific conclusions, while the final conclusions present the broader findings and their relevance to the contemporary context of architecture, proposing how the use of sketching in architectural design, research and education may be refocused in the future to concentrate on essential questions of place and its relationship with architecture.

Originality and contribution.

This thesis provides three main contributions to this field of literature. First, it focuses the discussion over sketching in contemporary and future architecture on the theme of place, using the process of sketching to connect design work with the actual conditions of place. Second, for reviving and re-evaluating an old method which is particularly useful for architectural research, education and design. The major conceptual contribution is to establish grounds for the direct continuity between architectural travel sketch and design sketch. It proposes how the design of place can be enhanced and improved through the careful handling of how these two poles overlap creating synergies in both areas. Third, through developing and expressing the argument throughout the thesis using the author's own drawings. This provides a consistent graphic logic across the different parts of the work, and develops the arguments visually as much as verbally.

The observation and analysis in each chapter also provides specific contributions regarding the individual drawings and projects analysed. These are all developed from direct and prolonged in-situ observation, which is then correlated against original drawings. Part II provides an in depth graphic analysis of Le Corbusier's Acropolis sketches in sequence, this is complimented with comparative in-situ drawings by the author and the results are compared directly to one of Le Corbusier's later project graphically demonstrating the conceptual connection made possible by means of sketching in-situ. The chapter on Siza's house provides an original graphic analysis of the design process behind the project starting from initial site sketches throughout the development of the design sketches. Part III provides original reflections on Utzon's Can Lis regarding spatial quality and transition, and Miralles' Santa Caterina Market in terms of time, movement, context and the active engagement of the user. These in-situ and explanatory sketches provide a contemporary record of each project in its current state and reach original interpretations of the different relationships between each project and place.

The originality of the thesis lies in its attempt to re-present a traditional, even ancient, architectural method within a new and changing architectural context. Drawing by hand is not out-dated, even if the way it has traditionally been used may be. To do so, one specific area of architectural sketching has been focused on, one which takes full advantage of the opportunities that drawing by hand allows, and one that relates directly to a fundamental, and according to Frampton, increasingly urgent principle of architecture: its relationship with place.

Without denying the advantages posed by new technologies in architecture, sketching has been presented as a means of improving the design process through the difficulty and resistance that both sketching and gaining a deep understanding of place require. These apparent inconveniences are considered essential reasons for the strength of the connection between sketching in-situ and place.

Summary of conclusions

The cyclical thought process developed through sketching involves embodied multi-sensory perception, and requires considerable and sustained mental effort to propose new ways of seeing. This not only fosters a gradual process of learning, but also

leads to a sense of commitment to those characteristics of place judged under real first-hand conditions, to the significant. The contextual understanding of place, together with commitment to certain critically judged aspects of it, can help the architect to design projects which establish meaningful connections to place.

This leads to two principle conclusions. First, that sketching is a way of thinking, and that most significantly for architects, in-situ sketching can focus this thinking on both future design and existing place simultaneously. While this has been instrumental in architectural design since the early Renaissance, changes in the contemporary context of architectural design mean that this focus may be redirected most profitably towards questions of place. If the role of sketching in architecture is encouraged to evolve, it may continue to provide an invaluable means of discovering, imagining and thinking through ideas for architects of the future. Second, that the travel, or place analysis sketch and the design sketch are essentially part of the same conceptual process. Through seeking as far as possible to combine rather than separate these two activities, architectural design can gain valuable insight into place and precedent which can improve the strategies used in its transformation through design. Consequently the place sketch is of fundamental relevance to architectural design, research and education. This may prove an important direction in which architectural drawing by hand may shift its focus to the great benefit of architects in the future. The cyclical thought process developed through sketching involves embodied multi-sensory perception, and requires considerable and sustained mental effort to propose new ways of seeing. This not only fosters a gradual process of learning, but also leads to a sense of commitment to those characteristics of place judged under real first-hand conditions, to the significant. The contextual understanding of place, together with commitment to certain critically judged aspects of it, can help the architect to design projects which establish meaningful connections to place.

Relation to the literature.

The thesis concerns sketching in-situ as part of architectural design, and its particular relationship to place. The research builds upon a general literature of drawing in architecture and the bi-directional connection between thinking and the act of sketching. It is also based upon several foundational texts on place, its perception and transformation through architecture. The inter-relationship between these two principle fields is then developed through combining and cross-referencing sources from further related areas including the historical analysis of pictures, the evolving cultural and social roles of drawings in architecture. The thesis relates to the following areas of the literature: drawing architectural thinking; place; interpreting drawings; drawing technique and drawing in the context of contemporary architecture.

Drawing and thinking

The connection between drawing and architectural thinking is discussed first. According to theories of visual thinking, images are integral to the thought process (Latour 1986)[1]. The idea that drawing is a determining part of the architectural process, although referred to since the Renaissance (Alberti) and discussed throughout the 20th century (Guedy 1902), has developed significantly in the literature written over the past forty years from Graves (1977) to contemporary architects such as Siza (1997), Pallasmaa (2009, 2012), Cook (2008), Gregotti (2014), who have all written about the importance of drawing for the development of architectural thought and design. Detailed discussions as to

1 Latour 1983. p.3 (footnote): "Goody (1977) points to the importance of practical tasks in handling graphics (lists, dictionaries. inventories), and concludes his fascinating book by saying that "if we wish to speak of a 'savage mind' these are some of the instruments of its domestication" (p. 182). Eisenstein switches the enquiry from mental states and the philosophical tradition to the power of print (1979). Lave has explored in pioneering studies how mathematical skills may be totally modified depending on whether or not you let people use paper and pencil (Lave, 1985, 1986; Lave, Murtaugh and De La Rocha, 1983). Ferguson has tried to relate engineering imagination to the abilities to draw pictures according to perspective rules and codes of shades and colors (1977): "It has been non-verbal thinking by and large that has fixed the outlines and filled in the details of our material surroundings... Pyramids, cathedrals, and rockets exist not because of geometry, theory of structures or thermodynamics, but because they were first a picture —literally a vision— in the minds of those who built them" (p.835)"

the functioning of design sketches have been extended further by Lapuerta (1997) and Sainz (2005)[2]. Other accounts express drawing, its motives and mechanics as a complex, simultaneous and multidimensional activity fusing together consciousness of the external environment with inner reflection (Berger 2005, 2008, 2011; Sennett 2008; Deleuze 1997). This thesis extends theories from design sketching towards the traditionally separated field of travel sketching. Similar to Graves, it adds further to this discussion through using the author's own drawings to develop a consistent graphic argument alongside the written explanation (see also Corbusier 1930, 1951, 1955). The thesis extends this with a systematic development and comparison taking advantage of the insight offered by the process of drawing itself but always cross-referencing to original drawings of other architects.

Place

Whilst Rapoport (1994) criticises the vagueness[3] of writing on place, its continued importance as an idea central to the human condition is affirmed by the vast and varied body of literature from a wide range of fields.[4] The definition of the term "place" from the architect's perspective is based upon the opinions of Frampton (1981), Siza (2010), Hernandez Leon (2007) and Muntañola (1974), and refers to the more philosophical considerations of Heidegger (1951), Relph (1973, 1976) and Casey (1993). Place is approached from the perspective of the in-situ sketch, both travel sketch and design sketch made on site. It connects to the literature on place both via thinking through making, or in this case drawing which serves to establish profound but nonverbal relationships between people and their environment (Sennett 2008). This uses the intelligence of the hand as well as direct intentional thought. It also focuses on the embodied nature of

2 The relationship between drawing and thinking is also researched in scientific fields of psychology through analysing patients' interpretations of drawings (Rorschach) and cognitive science, through observing and analysing the drawing during the process of design (Goldschmidt 1991, 2003; Schon & Wiggins 1992). In both cases, scientific methods of examination and experiment are employed to demonstrate the same fundamental issues raised in this thesis, that drawing reveals and drives the underlying thought patterns of the drawer.

3 Rapoport, 1994, p. 4: "Place is never clearly defined and hence vague; when definitions are found, they are illogical."

4 The literature regarding place is extensive crossing fields as diverse as architecture, geography and politics. Jiven and Larkham provide a literature review from 2003. Interesting reflections on how ideas of place are transforming with the rise of globalisation may be seen in the writings of Massey (1991, 2005).

in-situ sketching, the body forming an immensely sophisticated and unified simultaneous multisensory interface between mind and environment. The simultaneous combination and ordering of an immense variety of stimuli make sketching a uniquely sensitive means of observing the complex and dynamic condition referred to as place. This phenomenological connection of the sketcher with place is considered in terms of embodied perception (Merleau Ponty 1968, Pallasmaa 2009). This is complimented with ideas regarding time (Ricoeur 1990) on different perceptions of time as non-sequential happening (Cage 1961) or as continual succession from one state to another (Borges 1996). This thesis relates to this literature through understanding place as a dynamic transformative process, one in which the user is central. Time is an inescapable component of one's understanding of place, both in terms of the memory of the past, action in the present and the imagination of the future. It also connects the literature on drawing to that on place through developing ideas of embodiment from the phenomenology of Merleau Ponty and Pallasmaa. This is interconnected further through acknowledging that place is constructed by our own involvement, it requires active engagement through participating, which relates to thinking through making.

Historical analysis of pictures

A large body of literature concerns the interpretation of drawings, whereby images are analysed as historical artefacts in their own right. This area of the literature referring to architectural drawings of the recent or ancient past is often presented in the form of compilations of architects' drawings, accompanied by descriptions intended to place the work of different individuals in relation to one another emphasising their historical context above their architectural construction in terms of design (Smith 2005, 2008). However, in contrast to the drawing being a fixed immutable artefact, unchanging testimony of the past, Berger (2005) explains how the meaning of a drawing changes over time depending on the context from which it is seen. The thesis therefore distances itself from direct historical interpretation of original sketches and instead seeks to analyse the process of construction behind each drawing.

Other authors stress the difference between sketches whose primary role is to illustrate a preformed mental idea, and sketches which actively seek to transform and develop new ideas by means

of the thinking process which sketching involves. The sketch is an artefact which can reveal intentions through understanding the image's process of creation. Baxandall (1985) explains that the intentions behind a drawing are to be found in the construction of the image itself rather than in the modern interpretation of the context in which the drawing was made. The thesis follows a similar approach to Baxandall, seeking to understand the intentions behind drawings through analysing how the original image was constructed. Moneo (1976) makes the connection between architectural representation and architectural design, explaining how different drawing types and different types of architecture have often developed together allowing new representations of space and new ways of conceiving future designs. It uses the idea that drawing reveals as much about the drawer's conception of architecture as about that being drawn (Quetglas 2010), and that the means of representation is deeply linked to the architect's approach to design (Moneo 2004). It therefore focuses its arguments on careful graphic analysis of original drawings treating other sources as secondary compared to the information contained within the original sketch itself. It provides in depth analysis of particular sketches and projects from several of the most significant architects who have used sketching throughout the past century up until the present day.

The cultural role of drawing

The literature regarding architects' drawings which uses compilations of drawings examine the individual characteristics of each drawing and architect from the distance, often with a considerable separation in time. Some sources however research the practical use that architects make of drawings according to the opinions of their authors (Daidalos Nº5, 1982). Robbins and Cullinan (1994) use a similar approach providing a cultural and then sociological survey of how drawing has been used in the past five hundred years in relation to the reasons why architects used drawing in their professional practice in the 1990s. Through a series of interviews, Robbins explains the interests and concerns behind their drawings according to the authors themselves, but does not enter into a detailed external analysis of the images. The thesis uses their account to help justifies the claim that architectural drawing is at a point of transition and not of extinction, a situation which Robbins and Cullinan show has occurred to the benefit of architects and architecture in the past.

Although interesting and often enlightening, these opinions are often not as universal as their authors believe. Despite considerable devotion to sketching across the profession, there appear to be few generally accepted principles behind its use. There are also significant differences of opinion as to how positive sketching may actually be in design. Whilst the tacit understanding of sketching may be very deeply ingrained in a great many architects, it seems there are comparatively few who can explain it effectively in explicit terms (Oechslin, 1982b; Sennett 2008).

There are however surprisingly few books which use the drawings of the author to explain sketching in architecture. One notable recent example is "Eleven Exercises" by Marco Frascari (2011). This raises many profound points about architectural sketching and puts them into interesting and original contexts through presenting a set of exercises to encourage thinking about drawing in a new way through practicing it. However, despite the interest of the points raised, the written expression of the ideas and terms used is often idiosyncratic and opaque. It is interesting to note the number of Le Corbusier's books and most celebrated theories which he argued out using his own drawings and paintings. Despite the alternative means available to Le Corbusier for the expression of his thoughts, it is worth noting his continued reliance on his own hand drawn images to develop and convey his arguments. It is a form of idea presentation which has largely disappeared from the literature of drawing.

The thesis combines two methodological approaches to explain the tacit function and value of drawing in architecture. It uses Moneo's approach (1976) to discussing significant drawings from significant architects in relation to their specific design approaches. The investigation develops this further through detailed graphic analysis of individual sketches and projects. It combines this approach with that of Daidalos (Nº5, 1982) and Robbins & Cullinan (1994), whereby architects' drawings are juxtaposed directly with the written opinions of their authors. Recalling Le Corbusier's books and most celebrated theories which he argued out using his own drawings and paintings, the graphic argument is developed in combination with the written argument throughout the text, building up a simultaneous and consistent discussion through visual and verbal means (Corbusier 1930, Benton 2009). The sketches of the author are repeatedly cross-referenced to the sketches of other architects in order to continually place the author's point of view in relation to other well-known and widely acknowledged sketches.

Practical handbooks:

Whilst beauty in architectural sketches is of secondary importance, skill and ability assist the freedom of thought therefore the technical means of expression must not be isolated from the thoughts that they encourage. Therefore it is significant to include books which connect theory with the immediate technical practice of making drawings, such as Frascari (2011) and Ching (1996, 1998).

Drawing in the broader context.

The overall relevance of drawing in the current context of architectural design and research is debated at length in a number of collective publications (Daidalos Nº5, 1982; Yale 2012.) The evolution of theory in architectural drawing over the past thirty years is also traced in the publication of proceedings from the biannual conference EGA in Spain.[5] The thesis therefore develops an expanding field of literature which is refocusing the debate about drawing in architecture towards different areas of new importance in the current context.

Whilst new interest on a general but interconnected and global level made possible precisely by new technologies is demonstrated by the dramatic rise of urban sketchers and international events such as the *Big Draw*[6] as well as the considerable number of recent exhibitions devoted to drawing. Visual thinking (Latour 1986) and its relationship to design thinking has now crossed into disciplines such as management, although it was once rooted in scientific disciplines (Leonardo, Ramon y Cajal) (Fig. 13, Fig. 14). The thesis seeks to explain drawing and ways that it may be of current benefit to architects through visual as well as verbal arguments. This opens the opportunity for new dialogue with other traditionally separate disciplines via the shared medium and process of drawing.

This thesis provides an original contribution to this field of literature in several ways. First through developing and expressing the argument throughout the thesis using the author's own drawings. This provides a consistent graphic logic across the different parts of the work, and develops the arguments visually as much

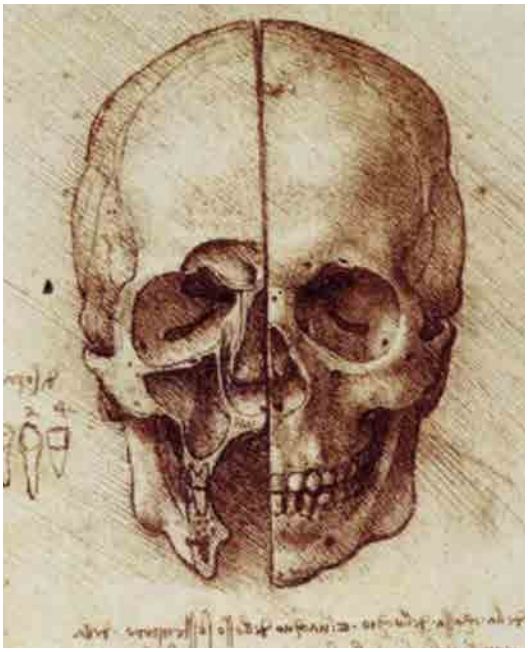


Fig. 13: Anotomical drawing. Elevation and cross section of a skull and teeth (Leonardo da Vinci)

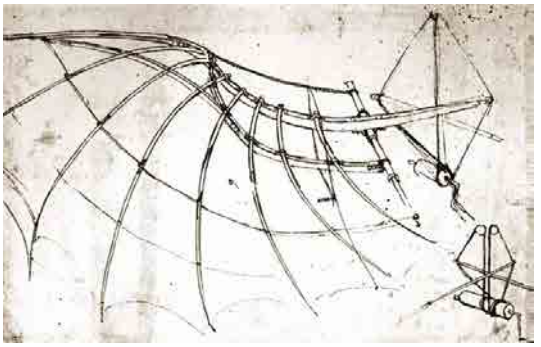


Fig. 14: Design for a flying machine (Leonardo da Vinci). The relationship between drawing to investigate anatomy and applying this anatomical knowledge to new designs is evident.

5 See Melian 2006, 2014. and proceedings from other editions of the Congreso Internacional de Expresión Gráfica Arquitectónica, EGA, Spain

6 Founded by Illustrator Quentin Blake.

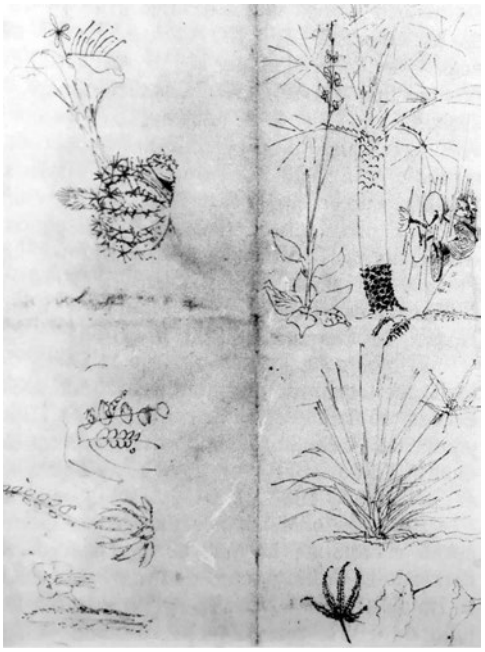


Fig. 15: Sketches of flora (Gaudi).

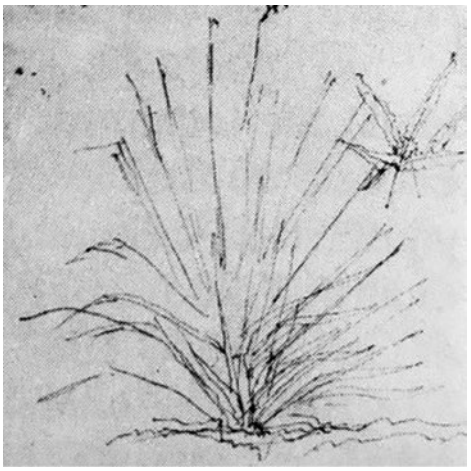


Fig. 16: Sketches of flora, detail. (Gaudi).

Fig. 17: Fence, Casa Viçens, detail. (Gaudi).

as verbally. Second, it focuses the discussion over sketching in contemporary and future architecture on the theme of place, using the process of sketching to connect design work with the actual conditions of place. Third, for reviving and re-evaluating an old method which is particularly useful for architectural research, education and design. The major conceptual contribution is to establish grounds for the direct continuity between architectural travel sketch and design sketch, proposing how the design of place can be improved through the careful overlapping of these traditionally separated areas.

...

Combining sketching in-situ with new technologies

Whilst project and place can be fused together through using the same medium of the sketch to investigate and design (as in the manner of Siza), different procedures for developing design can also take advantage of the opportunities that in-situ sketching can offer. Considering parametric design, Frampton criticises much of this approach to architecture above all for its autonomous nature irrespective of the specific nature of the place where it stands. The parameters behind such design may well determine many place specific factors, not least the building's response to climate, nevertheless many other aspects concerning the interaction between project and place are often left unresolved by the calculation of parameters alone. Sketching in-situ is a way in which an embodied analysis of place can help to guide the development of a project whatever the medium used, influencing the evaluations and decisions at each stage and referring back to their transformative effect on place.

Considering the opportunities for design offered by modern technologies, sketching and particularly sketching in-situ can be combined with them throughout the design process most effectively and with no necessary conflict. Arup Associates make a point of using sketching in the development of their projects at all scales, regardless of how technologically advanced the final result may be. Renzo Piano describes his working process of sketch, physical model, computer drawing repeated in a cycle for each iteration of the design (Frampton 2011). If technology is considered an integral part of the design process, as in the case of parametric design, then it is interesting to consider what role drawing by hand may still have. Whilst a detailed relationship

between sketching and new technologies falls outside the scope of this thesis, it is interesting to consider how architecture which in certain ways might be considered parametric in its design intention, arose long before the use of computers extended its potential. Maite Bravo (2016) discusses cases such as German Expressionism Bruno and Max Taut, and Antony Gaudí as being at the origins of parametric architecture for their ways of creating and developing form through the use of tools and methods which incorporate geometrical processes into the very design process itself, rather than merely in the end result of the form.

An example may be seen in Gaudí's design of structural elements which incorporate geometric form as part of their structural strategy. The use of parabolic arches freed his churches from the need for extra buttresses and extra vertical weight to counteract the horizontal thrust of transverse arches and vaults. The surviving models, such as the catenary model of the Colonia Guell church served the purposes of both structural assessment and refinement of form. Nevertheless the forms tested out arose first as drawings. Sections plans and perspectives record glimpses of the design development and its complex synthesis of structural, constructional, material and luminic qualities. Whilst Gaudi had to make use of models with weighted strings, to work out his structures, rather than modern programs for modelling calculation and visualisation, the thought process behind the design was developed through interaction with drawings, using the sketch in its various forms as the instrument of support.

Going further back to an earlier precedent, Brunelleschi used equivalent techniques to enable the construction of the dome of Florence Cathedral (Jones, Sereni and Ricci, 2010). The difficulty posed by the dimensions of the span were resolved through devising a new method of constructing the dome. Following his investigations into the construction of the Pantheon, Brunelleschi prepared a means to build the dome of the cathedral in a continuous spiral. Through carefully placing spiralling courses of bricks in between the horizontal courses, together with stone ties to withstand the hoop stress, the inner structural skin of the dome was gradually built, each circuit of the spiral supported on that beneath without the need for full timber centreing in the traditional manner. Throughout Gothic construction, arches were built first followed by ribs and then infilled with stone, brick or timber panels. The ribs themselves provided the geometric outline of the final ceiling. However, in Florence the ribs of the dome had to be built up in step with the surrounding skin of the

Fig. 18: Design sketch of the interior of the Colonia Güell church, near Barcelona 1890s. (Antoni Gaudi).

Fig. 19: Design sketch of the surroundings and exterior of the Colonia Güell church, near Barcelona, 1890s. (Antoni Gaudi).

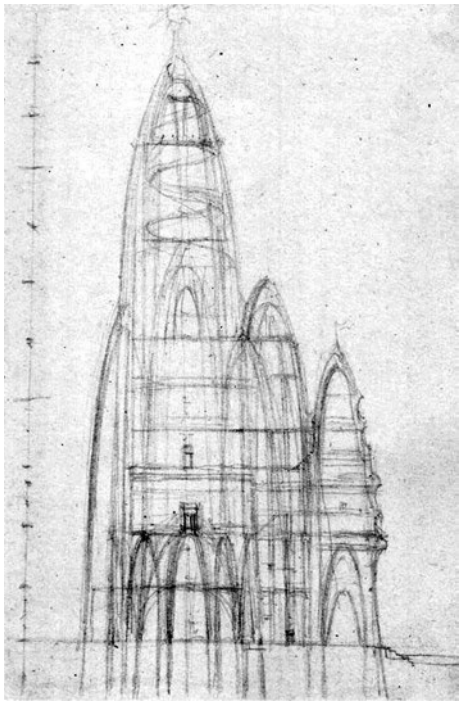


Fig. 20: Design sketch for the Hotel Attraction, unbuilt project in New York 1908 (Antoni Gaudi).

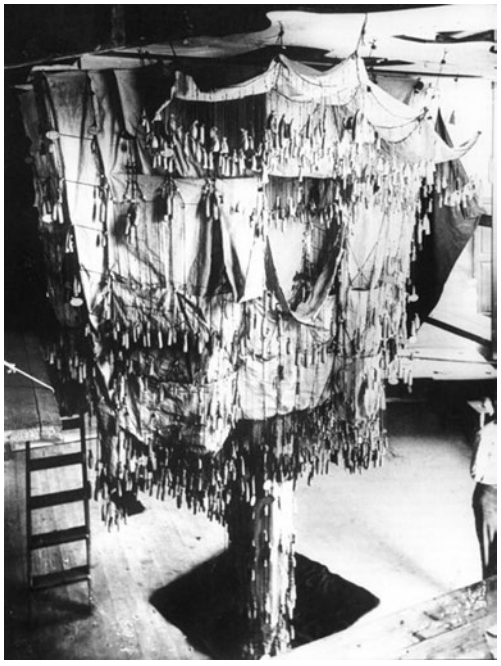


Fig. 21: Caterary model for Colonia Güell crypt 1890s. (Antoni Gaudi).

dome and consequently could not be used to either support or layout the geometry of the rest of the structure. Part of the difficulty came down to the accurate dimensioning and layout of the various elements. Brunelleschi made use of drawing in various ways to achieve this. On the banks of the Arno, a large flat area of sand was laid out in which he drew the profile of the stone ribs at full scale to provide a consistent template for the masons to follow. The laying out of the spiralling construction of brickwork also required designing a systematic technique for measuring the complex three-dimensional curvature of the leading edge of the skin under construction whilst also maintaining the maximum consistency in the precise placing of each layer of the spiral on those below.

The architecture of the dome therefore came down to a synthesis of form, structure and constructional process. Brunelleschi designed the methods and systems which enabled the dome to be built rather than directing the traditional building elements following traditional means. This step from the tacit knowledge of the mason, repeating techniques he already knew from experience, to the design of new types of structure and new ways of building requires some means of testing and experimentation. In the case of Gaudi, his weighted model for the Colonia Guell church may be described as analogue parametric design, using essentially similar steps as in digital parametric design, but allowing Gaudi to manipulate precise loads by moving weights and changing the length of strings. The resulting change in the loading was then made immediately visible as the form of the model would adapt to the new loads. Whilst the precise adjustment may be refined using such models, either physical or digital, the architectural approach to conceiving form must rely on a combination of many other factors. Questions concerning the relationship of a building with its site, let alone the more qualitative nature of place are resolved through thinking through the design process. The argument of the thesis is that the thought process itself can be assisted through visualising ideas in the form of sketches (plan, section, perspective etc). This thought process, whether ultimately developed through parametric design, or through more traditional alternatives, is still required if the resulting building is going to establish a meaningful and well-considered relationship with place. The connection between building and place is ultimately related to the person who uses, or dwells in it to use Heidegger's term (1951). The process of building and the resulting construction need to be more than the purely physical organisation of elements, and must respond

to the other more qualitative aspects of place[7]. Examples such as Brunelleschi's dome, or Gaudi's crypt incorporate both. The final form is the result of the architect's approach to place as much as to technique.

Gaudi's sketch of the interior of the nave shows greater concern over the qualities of space, light and material than over presenting the clearest possible definition of geometry and structural form refined later in the catenary model. Likewise Brunelleschi's sketches of the dome imply decisions over the height proportion and form of the new roof, decisions which, despite radical innovations in technique and direct inspiration from antique classical precedent, maintained certain Gothic characteristics of place in fifteenth century Florence.

The thesis proposes that the thought process which develops intentional connections between project and place, through combining material, structure and constructional process with all other aspects of architecture should still be present in all forms of contemporary architecture. Parametric design cannot be seen as a purely autonomous means of creating architecture, without some degree of intentional evaluation. This influence of a thinking critical vision which helps to guide the development of a project, must be present in all architecture regardless of its techniques of development and production. Whilst different methods may be used to develop this thought process, drawing calculating and modelling, the process of reflection followed by proposal experimentation, evaluation and adjustment is still essentially that which underlies the sketch. However the in-situ sketch may go further through combining embodied perception as the origin of design. A realistic human centred point from which to understand and transform place through architectural design.

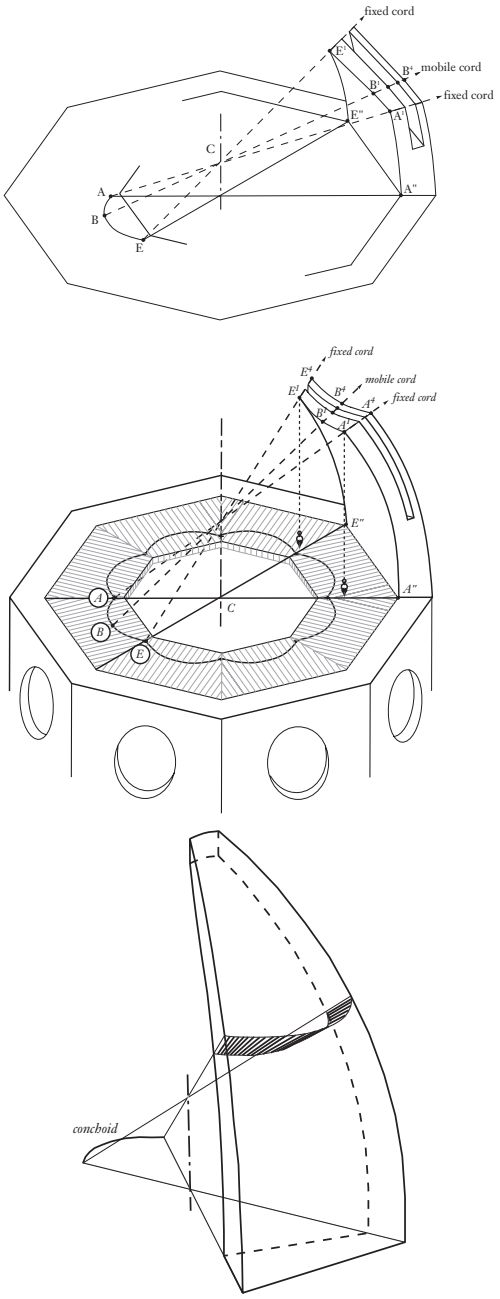


Fig. 22: Diagrams explaining the complex laying out procedure for brick courses in Brunelleschi's Dome for Santa Maria dei Fiori, Florence 1420–36. (Jones Serini & Ricci, 2010).

7 Muntañola, 1974, refers to this as socio-physical space

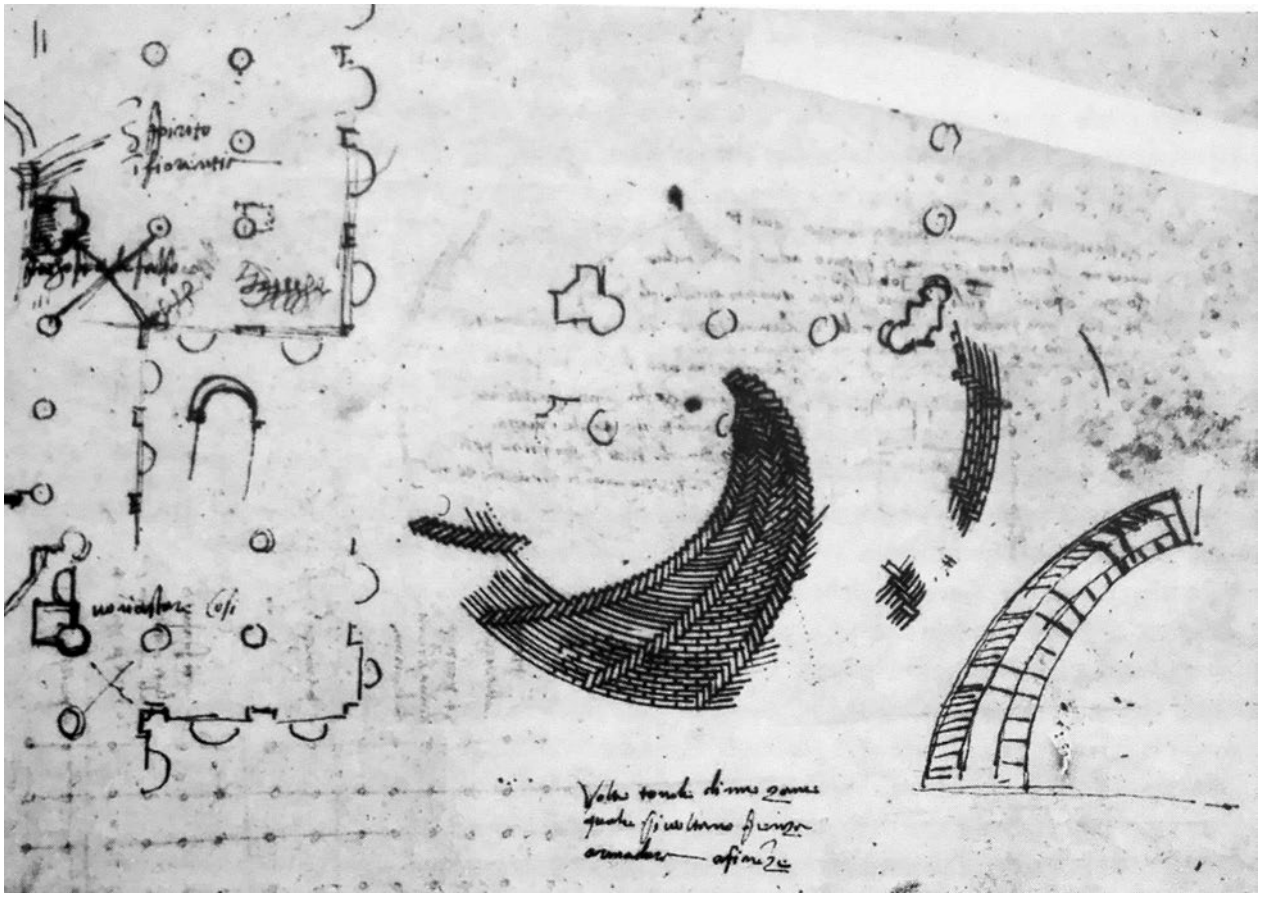


Fig. 23: Analysis sketch of the heringbone brick construction of the dome of Santo Spirito in Florence by Brunelleschi (Antonio da Sangallo the elder).

PART I

THE UNIQUENESS OF DRAWING

Since the Renaissance onwards drawing has been at the centre of the profession, allowing architects the chance to design before commencing the construction process, and to separate themselves from the tasks of the master mason on site. Drawing gave architects new accurate tools with which to foresee their creations, as well as a new degree of professional responsibilty distinct from that of the mason or builder. The history of the changes to the profession which new forms of architectural representation brought about are described by Robbins & Cullinan (1994). It is significant to note here that although drawing has been used by architects for millennia, its role has changed over that time, sometimes with vast consequences for the profession. Drawing has been useful during periods as far removed as ancient Egypt and the Modern movement, but for different reasons (Robbins & Cullinan, 1994) (Fig. 24).

Lapuerta (1997) comments that types of representation change much more slowly than types of architecture and illustrates his point mentioning how Palladio's sketches appear very modern while his buildings themselves are set within a specific historical time frame. However, as Robbins points out, the use of drawing in architecture transformed at the start of the Renaissance with the introduction of perspective. As the sketchbook of Villard de Honnecourt from the 13th century shows (Honnecourt, 2012), sketches dating from before this period do indeed appear quite contemporary with the architecture they convey, and far removed from modern ways of sketching (Fig. 25). Whilst types of representation in architecture may have far greater inertia than the architecture they picture, substantial changes in ways of drawing and the thought behind them have occurred relatively swiftly at certain points in history. Lapuerta does however see two common purposes for sketching across history: to compose order, and to record and combine typologies. A clear example of this are Le Corbusier's sketches of the monastery at Ema and his sketches for La Tourette (Lapuerta, 1997) (Fig. 26, Fig. 27).

Fig. 24: Drawing of a temple facade. Drawn on Papyrus (Egypt, 2nd Millenium BC)

For architects, despite apparent aesthetic similarities, drawings and sketches have meant different things and had different roles at different moments in time. Lino Cabezas considers that one of the primary advantages of drawing and in particular the use of perspective since the Renaissance has been as an aid to design innovation (Cabezas, 2008). Traditional architecture has no need to be drawn out before building. The final form of a vernacular building is already known due to the slow evolution of techniques. The master mason's knowledge and experience provided the guidance necessary to build the Gothic cathedral (Huerta Fernandez). The apparently small use of drawing in Gothic architecture was usually limited to templates for proportioning and construction. Brunelleschi's use of drawing was dramatically different, using the drawing as a means to work out solutions to questions which could not be comprehended from past experience alone (King, 2001). Cabezas (2008) points out that the use of drawing enables the creation of radically new designs with far greater distance from existing precedents.

Fig. 25: Drawing of a church tower (Villard de Honnecourt, C.13)

It is not surprising then that an interrelationship has long existed between architectural design and its means of representation. Renaissance innovations in architecture and urban design were interconnected with the development of conical perspective which placed the viewer at a specific static viewpoint, resulting in axial spaces (Bacon, 1976). Other drawing types also

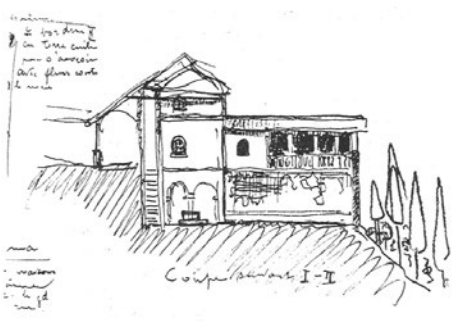


Fig. 26: Monastery at Ema, Italy. (Le Corbusier, 1907)

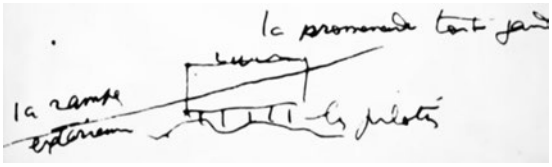


Fig. 27: Design sketch for La Tourette monastery, Eveux, France. (Le Corbusier, 1952)

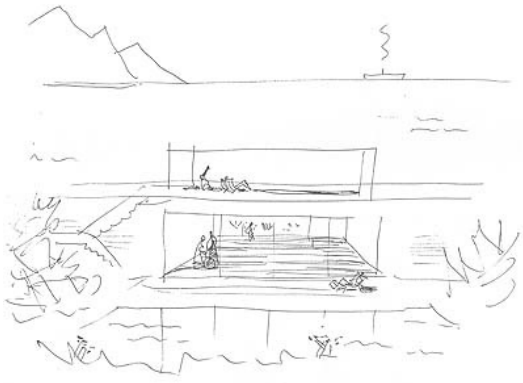


Fig. 28: Design drawing for a house near Alcudia, Mallorca. (A. De la Sota)

permitted the design of new kinds of spaces of increasing three-dimensional complexity. A letter written by Rafael to the Pope described the need of a new drawing type, the cross-section, in order to explain the complex space of his design for Saint Peter's in Rome (San José Alonso, 1998). The importance that types of representation have had on the ability of architects to envisage and design new kinds of architecture led Henri Guedy to claim that drawing is generating motor behind architecture and not just an instrument of expression of architectural ideas (Guedy, 1902 cited in Sainz, 2005).

The sociologist Edward Robbins sees two common roles in architectural drawing across history (Robbins & Cullinan, 1994). First is the "cultural" role of drawing, which refers to the graphic information conveyed in the drawing Second is the "social" role of drawing, which concerns how ideas are communicated and how the uses which drawing is put to are affected by the relationships between people such as architects, assistants, clients, builders, critics, among others.

However, there is also a fair degree of scepticism amongst architects about how far sketching can seriously assist the process of architectural design. Frank Lloyd Wright felt that the architect must fully understand a project before starting to sketch (Oechslin, 1982a).

Alejandro De la Sota, despite being an avid caricaturist and accomplished sketcher, felt the same about sketching in design[8] (Fig. 28).

Josep Llinás to some degree shares De la Sota's concerns that sketches can mislead and distract during the design process quite as much as help to reach solutions.[9] Whilst he believes that design sketches are necessary to help understand the consequences of one's designs, sketches also have a life if their own, and unless carefully controlled can distract from the principle issues. Like Wright and De la Sota, Llinás considers that architectural design is fundamentally cerebral – drawing is for capturing and communicating predefined design (Font, Crespo & Martinez, 2004).

On the other hand, apart from the confusion of opening up too

8 Abalos 2015. Abalos describes him spending hours looking up at the roof light in his office, before finally scribbling out the concept of an entire design on a single A4 page.

9 Llinás 2011. Conversation, Barcelona

many options, sketches can also be limiting in design. Oechslin (1982b, 1982c) mentions that initial design sketches can shackle ideas, fixing them and holding back the development of the project. It is essential that design ideas remain flexible and that the value of sketch lies in the thinking process behind it and not as a fixed document. First ideas are helpful to keep in mind, first sketches are not (Oechslin, 1982b).

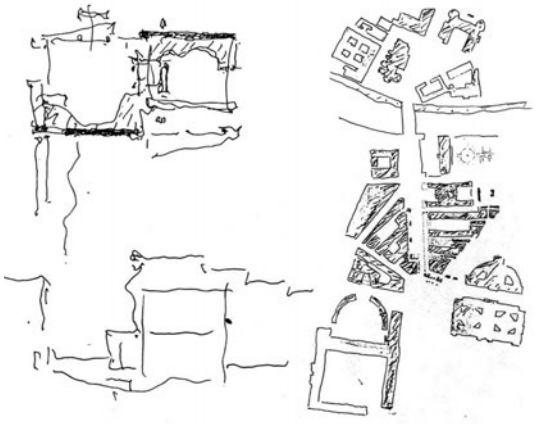


Fig. 29: Referential sketch of a project by Asplund (Graves 1977).

Whilst in recent times the teaching of drawing at architecture schools has largely been adapted to new media and the many alternatives offered by modern technology, there is not cause to completely abandon a practice which has been at the heart of architectural production throughout the major part of its western evolution. In the contemporary context of architectural education, research and professional practice, drawing must be adapted to the needs of the present if it is to be of active use rather than an atavism dogmatically pursued by a diminishing few. At the current point of change in the use of drawing in architecture, it is important to consider in what ways it stands out from "alternative" media in order to understand how these unique aspects function and to propose how they may be developed to make drawing more useful in new ways.

Fig. 30: Referential sketch of the Cestello Annunciation by Botticelli, 1490 (Graves 1977).

However, considering the breadth of opinions amongst architects both today and throughout the previous century, there really are no universal rules for how sketching is best used in design (Oechslin, 1982b). Every case is individual, both for every architect and for every project. Amongst the most influential explanations of the use of sketching in architecture is given by Michael Graves (1977). Whilst accepting that sketches are inevitably ambiguous and can never be decisively placed within strictly defined categories, he attempts to distinguish three principle stages in design each with their own use of drawing. He classifies these as the *Referential sketch*, the *Preparatory study* and the *Definitive drawing* (Fig. 29, Fig. 30).

Nevertheless, as new types of representation evolve in the current architectural context, the traditional uses ascribed to different types of sketch at different stages of a design may no longer remain as clear. The interaction of design sketching with alternative media throughout the design process means that it is no longer helpful to categorise sketches into any kind of hierarchy of taxonomy. Instead it may prove more productive to consider that design sketches can include any combination of its distinctive attributes at any stage of the design process. The character-

istics and usefulness of a design sketch are constantly changing, involving particular intensities in certain areas. Many interesting parallels may be seen between Deleuze's description of rhizomes and tracings and the ways in which sketches can help to structure and connect ideas during the design process (Deleuze & Guattari, 1997).

The intention of this section is to see which aspects of drawing are now of greatest relevance and use to current architectural design, those which have not been superseded by alternative technologies and to understand why. The discussion focuses on three particular themes which make sketching – and specifically sketching in-situ – unique: place, subjectivity and time. Although these are all shared to some degree with other media, their role in drawing is particularly important. The fundamental role these three themes play in the course of sketching distinguish the very nature of architectural sketching from other alternative media As they all form part of the process of architectural design they may be of use to design work itself.

First is how architectural design can learn from place and foresee how to best improve a site by drawing in-situ. This kind of travel drawing provides the architect with a direct means of analysing and reacting to a specific environment which few other media can rival. The majority of computer based techniques are located in studios, removed from direct immersion in place that sketching allows. Photography, video and similar media may capture information on location, but a considerable, if not major, part of their creation happens off-site, editing at a remote location. This is a significant difference, because whilst drawing in-situ, the sketcher captures information from the surroundings but at the same time mentally processes this information, in one continuous cognitive cycle. The separate tasks of observation and interpretation are not only combined, but are fully immersed in the context of a specific place. The fact that sketching allows the entire cycle to take place means that critical feedback helps to modify and improve the drawing whilst it proceeds. Consequently the actual procedure of making a drawing on site creates the opportunity to design one's own understanding of place through experiment and refinement. The sketcher's understanding of what is most important about a place takes shape gradually through actively engaging with the drawing and place. It therefore provides a uniquely sensitive medium with which to examine place. The directness of this relationship with place is therefore one of the most significant aspects to consider.

A second theme is how subjectivity affects the drawing process, and is in turn affected by it. Whilst all forms of representation are inevitably subjective to some degree, sketching in particular can be used to some degree to control the subjective element and to turn it to the advantage of design. Developing and reasoning out intuitions to find insights for design, or holistically evaluating the most subtle multisensory perceptions can lead to original and subtle responses to place. Travel sketching may take a useful role throughout the design process on account of the capacity to integrate observed information with imagined proposals, through helping to provide a balanced control of subjective ideas, and also through allowing the clear communication of these personal ways of seeing with others.

Thirdly, time is discussed as a fundamental component of all stages of the sketch. The process of drawing interrelates different stages of time fusing together memory, present observation and imagined future as well as its changing contextual interpretation over time.

CHAPTER 1

PLACE

"He would awake to see the towers and minarets printed on the exhausted, dust-powdered, sky, and see as if 'en montage' on them the giant footprints of the historical memory which lies behind the recollections of individual personality, its mentor and guide: indeed its inventor, since man is only an extension of the spirit of place."

Durrell, 1957. *The Alexandria Quartet: Justine*, p.156

The ability of travel sketches to uncover and convey a sense of place was the original motivation behind this work. The following chapters build on the arguments of the preceding chapters discussing how place, subjectivity and time affect the in-situ sketch.

"Place, by virtue of its unencompassability by anything other than itself, is at once the limit and the condition of all that exists...place serves as the condition of all existing things...To be is to be in place" (Casey, 1993. pp15-16).

Place is important as it forms a fundamental part of the human condition, as embodied beings people are "bound by body to be

in place" (Casey, 1993, p.104). The body relates to its environment in many highly sensitive and sophisticated manners. The human body provides the frame of reference through which we measure our surroundings allowing us to judge our environment in relation to ourselves. The design of architecture inevitably affects how we observe and interact with place, and therefore how we relate to our context[10].

Frampton considers place to be one of, if not the most, important questions which architectural design faces (Frampton, 2011). He argues in his chapter on Critical Regionalism that architecture must respond to the specificities of place as connection to site and local culture can produce variety in architecture which is otherwise tending to become globalized and mediocre, with the same design spread indiscriminately across all parts of the planet irrespective of local climate, customs, materials and other unique factors (Frampton, 1981, 2011). Whilst this has repeatedly been interpreted negatively in political terms, many authors, both architects and non-architects, consider that identification with place and attachment to it should be a positive thing (Massey, 1991, 2005). In this chapter, how architecture interacts with place is not considered to be a question of continuing authentic local traditions which must be fixed and protected by restrictive regulation (Jiven & Larkham, 2003). Instead, architecture is seen as a means to enrich place, offering new transformations of the existing and creating innovative ways to transform and create new places. The Sydney Opera house, and the Bilbao Guggenheim (Fig. 31, Fig. 33) both insert radically different buildings into foreign contexts, yet both have brought about dramatic and positive transformations of their surroundings, changing the nature of place by inserting new ideas intertwined with the conditions of their sites (Linares, 2009; Wigley, 2011).

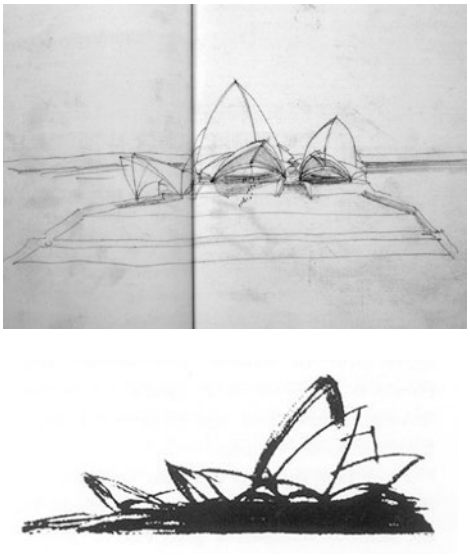


Fig. 31: Design sketches of the Sydney Opera House (Utzon 1950s). The upper sketch includes selected elements of place, positioning the platform and roofs of the project in relation to the bay, horizon and sky.

Frampton specifies that one of the constituent aspects of place is that it must be limited by an edge. The endless expanse of Superstudio's proposals is the reverse of this opinion (Rowe & Koetter, 1979; Frampton, 1981) (Fig. 32). But if place requires some kind of boundary to distinguish it from its surroundings, what form should such limits take. Frampton (1981) explains his concept of the limits of a place by quoting Heidegger, place begins at the point from which it starts its presencing (Heidegger,

Fig. 32: Collage by Superstudio. "A journey from A to B", 1969, "There will be no further reason for roads or squares". (Cited by Frampton 1981.)

10 Muntañola dicsusses place in terms of physical conditions combined with social conditions, which include cultural, historical factors. See Muntañola 1974.

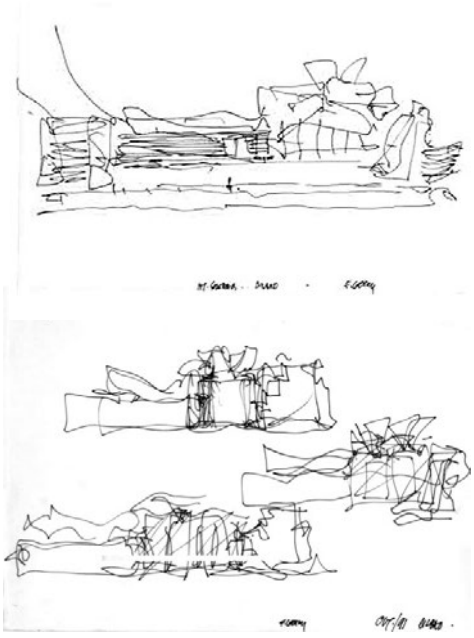


Fig. 33: Design sketches for the Guggenheim museum, Bilbao (Gehry 1991). The upper sketch includes the road bridge top left and river bank, aspects of the site with crucial impact on the design.

1993 p. 356). In other words at a point in which its influence may be felt or in some way perceived. But this is ambiguous and open to personal interpretation. As Massey points out, place need not have one single cohesive identity, it may have multiple identities. In which case, according to Frampton's definition, the limits of place ought to be different depending on which of these multiple identities one considers. To give an example developed further in part three, the Santa Caterina Market in Barcelona responds to the multiple identities of its context and users. The project has been designed for those who live and work there, it interacts with its immediate environment creating a local sense of place within a small range of the surrounding streets. At the same time it has been designed to include the visitor and tourist whose wider frame of reference may relate the market to other related structures spread across the old city.

Sennett (2008) notes the difference between boundaries and borders as being that one serves to confine and delimit, whilst the other is a point of connection and transfer between two different places. This second idea is of more use to architecture, as place may become negative if excessively confined. Place is not introverted; its influences and causes are infinite and global. Massey (1994, p. 154) considers that places do not have boundaries, but are instead "articulated moments in network of social relations and understandings". These are influenced by a far wider field than the edges of place itself. The world becomes a network of influences and relationships in constant change – a constellation of focal meeting points, places which are all different and constantly changing.

Place is not a thing which can be fixed and defined. It works as a dynamic process in constant change. Architecture plays a part not only in helping to reveal the real nature of place, but also in transforming place (Hernandez Leon, 2007). Places have multiple identities, but are not dependent on boundaries. Places are not defined opaque boundaries, but are bordered by permeable limits. They are about connection to the outside not just contrast with it. Places and the characters that they have can only be explained by seeing them in relation to places beyond. Place therefore only makes sense in the context of a far larger scale.

Place and participant

Place may be distinguished from space by the fact that it requires a user. As in the de-objectivisation of twentieth century art[11], the information brought by the participant forms a crucial part of any experience of place. The subjective input of the sketcher on the drawing, recreates this combination of user and place in the actual process of making the drawing. This fusing of objective and subjective factors mean that the act of sketching is a direct extension of the experience of place (which fundamentally depends on the user), in a way that other recording media, such as a photograph, are not.

In recent years the literature regarding place has also tended towards the idea that place, and all the characteristics which affect it, is determined by the experience of a person. The environment by itself is not enough to create a sense of place. With no person, a location is no more than a space, doubtless with its own specific characteristics, but without the essential quality of human dwelling (Heidegger, 1971). Place is created by one's actions as much as by the objective characteristics of the specific environment. A parallel may be seen in twentieth century art with the concept of de-objectivisation. Taking the bicycle wheel mounted on top of a stool by Marcel Duchamp as an example, the value of the art is not considered to be in the value of the objects themselves. Instead, observers are responsible for bringing their own ideas and impressions from outside the artwork – in this case the knowledge necessary to appreciate the contradiction between the static nature of the stool and the dynamic nature of the bicycle.[12]

The observer therefore becomes an essential component of art, and also of place. Neither make sense in isolation. When it comes to drawing place, the metaphysical presence of the sketcher is just as necessary as the objective qualities of the location. In order to create and register the sense of place, the sketcher has to experience the place in its surrounding context. Equally, in order to experience the place and be able to understand it, the sketcher must also bring his own prior knowledge and input.

---

11 Duchamp, 1913. Bicycle wheel. See Kuenzli & Naumann, 1991.

12 A further example is 4'33", a composition by the American Experimentalist John Cage. The performance involves 4 minutes and 33 seconds of silence. The audience must bring their own thoughts and ideas in order to interpret the music. For other writings on Silence, see Cage 1961.

Architecture unveiling and transforming place

"As a poet of the historic consciousness I suppose I am bound to see landscape as a field dominated by the human wish - tortured into farms and hamlets, ploughed into cities. A landscape scribbled with the signatures of men and epochs. Now however I am beginning to believe that the wish is inherited from the site; that man depends for the furniture of the will upon his location in place, tenant of fruitfull acres or a perverted wood. It is not the impact of his freewill upon nature which I see (as I thought) but the irresistible growth through him, of nature's own blind unspecified doctrines of variation and torment."
Durrell, L., 1957. *The Alexandria Quartet: Justine*, Faber and Faber, London. p.100.

By its very nature, architectural design involves changing the essential structures of place. A new building will inevitably change the essential characteristics of a place, be they physical, cultural, social, environmental or in other ways. But at the same time as transforming the sense of place, architecture also has the ability to reveal the fundamental or underlying nature of place (Hernandez Leon, 2007). Structures which have organised space in the past may reflect primary characteristics of a landscape or its culture. By incorporating such structures into the design of a building, the architecture itself can make visible a whole range of characteristics which make a place distinct from other places and reflect a type of order which establishes connections with a place, its inhabitants and its uses over a large timescale. In describing the underlying structures of place, Navarro Baldeweg (2013) looks back through historical paintings to see what features of a place have provided its major characterised over its history.[13]

This may be achieved in a great many ways, but in general terms it involves finding important aspects of a particular place, and rather than simply applying them as in the past, or uncovering them as if they were archeological remains to be exposed to view, it requires interpreting them in new ways which respond to the culture and situation of the present. This transformation of the essence of a place involves reinterpreting the ideas of the past

13 Navarro Baldeweg 2013 Lecture at ETSAB, UPC. Reference to his projects in Holland and Rome.

through incorporating new aspects. These new or foreign ideas may not necessarily have any prior connection to the place, but they serve to present the local ideas in a new light (Wigley 2011).

In-situ sketching is best placed to investigate this relationship between architecture and place because it approaches it from the perspective of a participant in place. Given that place requires the active engagement of a participant, this means that the sketcher is in direct contact with the underlying characteristics of a place as well as with the experience of a particular architecture. The subjective personal input which sketching involves introduces a realistic human perspective to the descriptions of a place. In so doing, sketching generates critical discussion between the objective reality of place and the sketcher's interpretation of it. Sketching provides the medium for this discussion through stating how experiences of place fit in relation to other similar experiences and helps to propose equivalent associations.

Embodiment

Phenomenology has placed thought within the context of the body. Thought is inseparable from its relationship to physical existence. The idea of dwelling, of being safe, or remaining in a particular place is deeply tied to this relationship of man and environment (Heidegger 1951). As Casey (1993) puts it, to be, in fact means to be in place. In other words to be "aware" of one's specific relationship with place. The embodiment of sketching in situ involves being physically immersed in an environment and attentive to everything about it for a sustained (even if relatively short) period of time. In other words, to stop and linger, to concentrate on the influences of one's surroundings and react to them through throwing forward proposals – in other words, designing. Perhaps the most fundamental advantage of place sketching over other forms of place analysis, is the human point of view that it conveys. This need not necessarily be a perspectival drawing made at human eye-height, but whatever the type or form of the drawing, embodiment entails an overall combination of all the senses and manners of perception available to the observer. The revelatory effect can be a consequence of this kind of embodied, considered and intentional observation[14]. Place sketching converts us into actors rather than mere observers as

14 Deleuze uses the term "apperception" meaning, "The mental process by which a person makes sense of an idea by assimilating it to the body of ideas he or she already possesses." OED 2010.

is often the case with other technology. It also focuses our attention on the observation of original sources – place experienced in person – without the mediation of other technologies with their own capabilities and underlying intentions. Place sketching is specifically useful for research as it focuses on the contemporary analysis of place based on the direct observation of original sources. It also provides a research perspective based on human, lived experience.

Sketching provides a method of engaging with place in order to learn about it. The most obvious way in which travel drawing allows the sketcher to engage with place is through the physical experience of being present in situ, otherwise referred to as embodiment. Apart from the physical fact of spending time in a particular place, in situ sketching involves a particularly receptive and sensitive frame of mind which is sustained throughout the course of sketch. This receptiveness applies to the body as a whole system – becoming an extremely sensitive instrument to observe the exterior environment through holistic perception via all the senses (Pallasmaa 2009). This multisensory observation is seamlessly combined allowing each sensory stimulus to settle to its own appropriate level relative to the others. Although a sketch may only present a two-dimensional visual output, the information which has gone into the process of making it has been stimulated by all the other senses together. This does not mean that the sketch directly represents different noises or smells, but rather that other environmental conditions will vary the visual construction of the image. Apart from the five commonly described senses, Pallasmaa (2012) mentions further variations of the senses, suggesting up to thirty. Furthermore psychological perception depends on many more complex sensations registered through exceptionally subtle combinations of the physical senses.

Physical embodiment takes advantage of the body's capacity both to register and combine all sorts of environmental information simultaneously, and also to mentally process them ordering them according to their relative importance at that moment. Physical embodiment is therefore important in that it makes use of the whole body as an immensely sensitive instrument with which to observe place in all its dimensions.

The process of sketching takes advantage of this. Observations and perceived sensations are expressed in the drawing and then compared directly on the page with the actual physical experience of the place. As this process repeats cyclically, the ob-

servations and perceptions are gradually refined. The length of time taken and the repetition of observation, reflection and interpretation followed by direct critical comparison between this interpretation and actual reality builds up an increasingly deep interaction with place. Engagement is this mental understanding arrived at through physical presence and cerebral reflection.

In terms of place and its transformation through architectural design, this means that the local characteristics of place may be combined with new ideas brought from outside from different context and according to a logic as yet not evident in the local environment. Fusing foreign and local or grafting one onto the other, as Wigley (2011) puts it, may be imagined, compared and evaluated with great ease and effectiveness through sketching. This is especially effective in the case of in situ sketching, which embeds foreign or new ideas into selected aspects of a local observed context.

The sketching process also combines objective and subjective factors through a sequence of critical reasoned steps, providing a logical method for learning about place. This is unique in its ability to take advantage of subjective experience and associations, whilst adapting these to the specific characteristics of place. Sketching helps to combine these two in their realistic proportion from the perspective of human perception. Sketching on site provides a means to balance these two influences, using the direct experience of reality to combine them in a way which may genuinely reflect the real situation. For the sense of place, this balance – the evaluation of which factors are dominant or secondary – is achieved more reliably through direct embodied observation than through distant analytical methods which although they may investigate certain aspects in far greater and more objective detail, are less likely to correctly balance these factors building up an overall picture of place which reflects less realistically the actual experience of it.

Analysis and proposal

To a large degree, we understand place through comparing it with our experiences of other places and ideas. The better these subjective associations – the more varied yet precise these associations are in one respect or another, the more exactly we may understand the objective qualities of place, and the better possibilities for its transformation will appear. The activity of

sketching is important because it involves both observation but also actively proposing a way of interpreting place and of representing it. This requires an active mental effort which focuses the mind becoming more sensitive and more selective than under normal circumstances. It is perhaps equivalent to straining to hear an unusual noise which is too quiet to notice in normal conditions, but becomes quite audible and understandable when one concentrates carefully upon it. The better that sketching manages to propose subjective associations and combine them with objective reality, the better balanced the final understanding of place will be.

…

In order to make good decisions about how to positively transform place through architectural projects, it is essential to attain a profound understanding of place. This understanding needs to be from a realistic human perspective. Sketching in situ develops this kind of profound and human centred understanding of place. When sketching in-situ the sketcher is not only capturing information but is also putting himself in the position of place observer – in effect creating the place through observing it directly. Observing from inside, and being observed by it, rather than outside from a distance. This active immersion in place through in-situ sketching means that decisions over designing and changing place will start from perception of the real (not the sketch, but the holistic experience of place whilst sketching) rather than from an abstract selection of data (as in a topographic plan). Place is not an objective concept, but depends upon people using it and consequently on their subjective experience. The effect of place depends on how subject and object, observer and place, intertwine through embodied experience and thinking. A dialogue is formed between place and observer by means of the senses, and this dialogue is both pushed forward and recorded by the process of sketching.

Fig. 34: Apse of Albi Cathedral (Kahn, 1951).

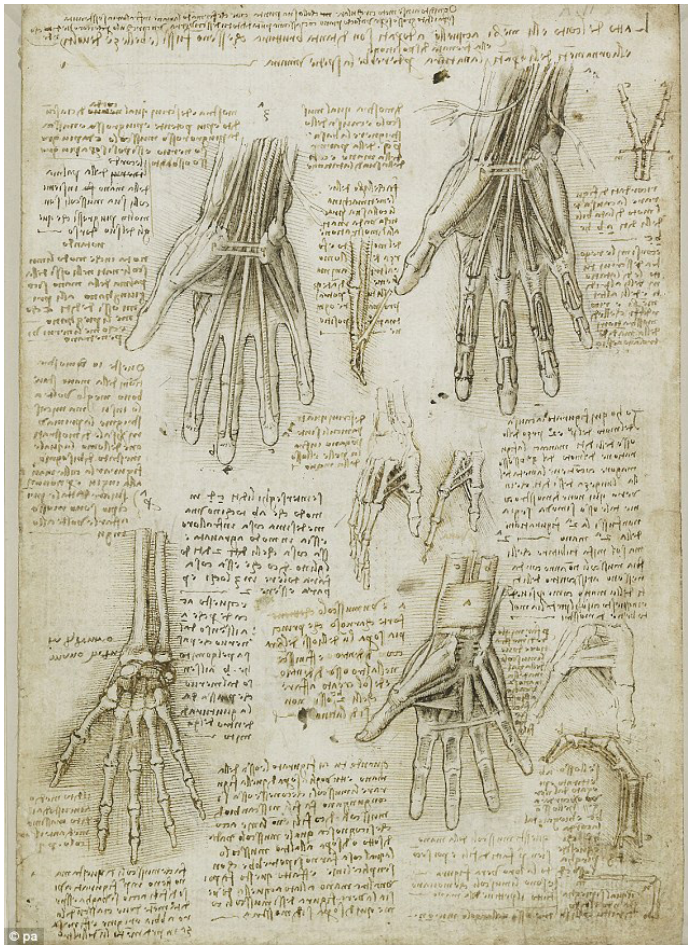


Fig. 35: Anatomical Sketches: Dissection of the hand. R.L. 19009. (Leonardo da Vinci 1485–1515).

CHAPTER 2

SUBJECTIVITY

"Drawing is a form of probing. And the first generic impulse to draw derives from the human need to search, to plot points, to place things and to place oneself."

Berger, 2011. *Bento's Sketchbook* p.150

Travel sketching is sometimes considered a form of graphic note-taking, the purpose being to capture information from a particular place and record it in a fixed form. The drawing is meant to translate onto paper, as directly as possible, the information contained in the objects which make up the surrounding environment. This information is highly selective, but nevertheless, the intention is that it may provide a sufficiently objective record to be of factual use in later design work. This notion that drawing can produce relatively objective results has developed with science, note for example the graphic precision of Leonardo's anatomical studies in the 16th century (Vinci, Keele & Roberts, 1983, pp.116-118) (Fig. 35). Still today, archeological field work often involves the precise description of the form of finds using drawings. In the past this developed because there

was no alternative means of capturing information graphically. Napoleon sent large teams of draftsmen on his campaigns with the intention of recording what they came across. The more individual draftsmen, the more objective the average of their many observations would be (Charney, 2010. p.94).

In the 19th century, scientists were not only interested in capturing information and fixing it in immutable form, but also valued the process of drawing for the discipline and attention that its practice required. Ramon y Cajal (the founder of modern neuroscience) believed that training the powers of observation was essential for a scientific education (Fig. 36). Consequently he insisted that his students take classes in watercolour as drawing from nature provided the ideal exercise to develop such observational skills (Pallasmaa, 2009, p.90).[15]

Fig. 36: Drawing of a nerve system (Ramon y Cajal).

The development of photography provided an alternative, and gradually more convenient, means to capture information from the surrounding environment gradually reducing the need for drawing on location for the purpose of recording alone. Nevertheless whilst photographs may provide a more complete record of a view than a sketch, the manipulation of the camera, choice of view, composition, tone, contrast, mean the results are always determined by the personal, subjective criteria of the photographer (Fig. 37). A photograph may therefore not necessarily be any more objective than a scientific rendering drawn by hand.

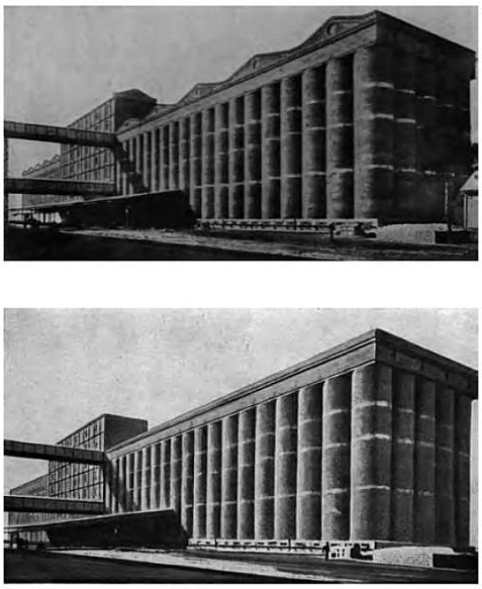


Fig. 37: Photographs of grain silos manipulated by Le Corbusier. Original photograph above, manipulated image below (Le Corbusier, reprinted in Towards a New Architecture, 1923).

Nevertheless, whilst a significant degree of objectivity can achieved in certain types of precise drawing, the process of drawing itself is inevitably dependant on the eye, mind and hand of the drawer. The architectural travel sketch discussed here is not a question of precise representation like the palaeontologist's rendering of a fossil. A brief look through travel sketches by the main proponents of the Modern movement will show that objective recording was never their main aim (Fig. 39). Whilst many are undoubtedly significant analyses of place, the subjective representation of their subject matter was always intended to convey

15 "If our study is concerned with an object related to anatomy or natural history, etc. observations will be accompanied by sketching, for, aside from other advantages, the act of depicting something disciplines and strengthens the attention, obliging us to cover the whole of the phenomenon studied and preventing, therefore, details from escaping our attention which are frequently unnoticed in ordinary observation [...] The great Cuvier [French naturalist, 1769–1832] had reason to affirm that without the art of drawing, natural history and anatomy would have been impossible. It is not without reason that all great observers are skilful in sketching." Ramon y Cajal quoted in Pallasmaa 2009, p.90

particular ideas which were as much to do with the imagination of the sketcher as they were inherent to the view being drawn. The fact that so many of the most influential architects of the last century placed so much faith in their travel sketches suggests that this intentionally subjective vision was of great significance to them, and one which photography did not substitute (Fig. 38).

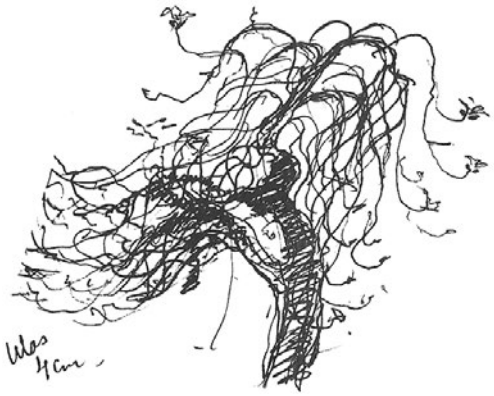


Fig. 39: Travel sketch of a fig tree (Aalto 1951).

Given the variety of motives for drawing, Lapuerta (1997) groups architectural sketches into various types. Amongst others, he singles out analytical drawings, conception sketches, recompilation drawings, summary sketches, site sketches and travel sketches. All drawings are documents of thought and discovery, having the same intent to bring order and clarity out of chaos, whatever their precise uses.

Formally, travel sketches may be the same as design sketches and are sometimes hard to distinguish drawn alongside one another (Fig. 40, Fig. 42). The travel sketch in part comes down to the desire to find ideas. Siza believes the best way for an architect to learn is through travel, to see things directly. One cannot create things out of nothing. Drawing is the desire of the intelligence.[16] Nevertheless, sometimes one only draws what one is already interested in. Miguel Fisac described how on his visit to Spain in the 1950s Aalto was far more interested in vernacular architecture than that of the Escorial Palace.[17] Aalto's sketchbooks of the journey reflect this, he drew what he was already interested in. Wigley describes Utzon's sketches of platforms in Mexico and temple roofs in the far east as effectively a means of post-rationalising his work on the Sydney Opera house and not the source of the design's inspiration.[18] Apart from the desire to find the new, travel sketches can also show great predefined ideas, not

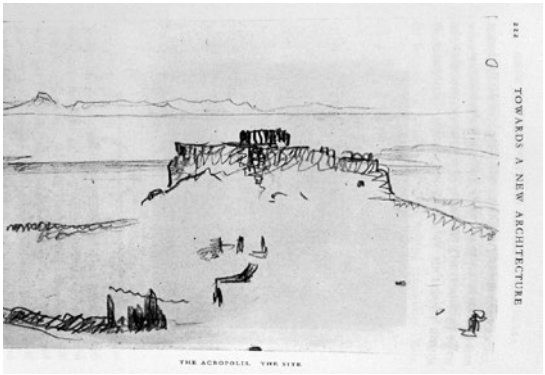


Fig. 38: Travel sketch of the Acropolis drawn in 1911 (Le Corbusier, reprinted in Towards a New Architecture, 1923).

16 "El mejor aprendizaje para un arquitecto es viajar, ver las cosas en directo. No se pueden crear cosas de la nada. El dibujo es el deseo de la inteligencia." Alvaro Siza quoted in Lapuerta, 1997, p. 53

17 Miguel Fisac tels how Aalto famously chose to draw vernacular architecture but not the Escorial. Fisac: "llegamos a casa de Gutiérrez Soto (...) y cuando terminamos de comer dijimos que íbamos a ir al Escorial y nos pusimos en el coche; me acuerdo que iba este señor (Aalto) en el centro, Aburto a un lado y yo al otro. (...) Cuando llegamos al Escorial (...) dijo que él El Escorial no. Y dijimos que ya que habíamos ido, pero él dijo que no, de ninguna manera. Pensamos vamos a irnos al Hotel Felipe II para que vea la perspecti- va; salimos a la terraza del Felipe II, llegó, volvió la cabeza, e hicimos un corro y estuvimos con él dando la espalda al Escorial. No lo quiso ni ver; pero así, ¡nada! Que a nosotros nos pareció una cosa un poco absurda... porque le iba a afectar... See DELGADO ORUSCO, Eduardo, "Alvar Aalto en El Escorial", El Monasterio de El Escorial y la arquitectura: Actas del Simposium, 8/11-IX-2002, p. 451.

18 Utzon 1962, Wigley 2011

open unblinkered discovery.

Lapuerta considers the site sketch to be a means of appropriating the site and its mystery in the same way as a travel sketch. Often spark of inspiration for later design occurs here. Site sketches are a highly processed form of data collection in comparison to other more objective means – yet for the architect it is precisely this method of mental processing in-situ which makes it so sensitive to the nature of place. Whilst subjective factors are an essential characteristic of all sketches, in the case of travel or place sketches, the objective input from the real subject matter being observed takes on extra significance. If travel sketching combines both subjective and objective factors, what is the relationship between them, how do they interrelate and what is the optimal balance between them for use in the design process? It might appear that site sketches which are excessively objective may provide little original insight to design which could not be achieved through alternative simpler means. On the other hand, excessively subjective sketches may provide little more than wilful idiosyncratic ideas of little practical or rational use to the process of designing place. Each extreme is likely to have a negative impact on design.

Fig. 40: Site sketch for a museum in Shiraz, Iran (Aalto 1969).

However, place sketching is particularly interesting for its capacity to seamlessly combine both objective and subjective information within the design process. Sketching can make the incorporation of subjective ideas more logical and reasoned, whilst making them more sensitive and responsive to the objective realities of place. The design process and design sketches in particular must achieve a similar balance between objective and subjective ideas. Mark Wigley (2011) refers to this as a combination of local ideas, connected to place or site, and foreign ideas introduced by the mind of the architect brought from an utterly different context. The subjective presentation of ideas in a travel sketch have the potential to help design through emphasising a personal and human perspective. It may provide both variety as well as original insights, basing architectural design fundamentally on place and human experience. This is especially important as it will develop and strengthen the connection between architectural project, participant and place.

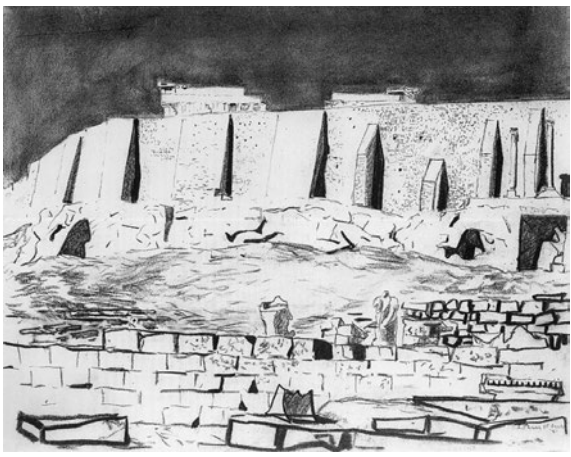


Fig. 41: Acropolis, Athens (Kahn 1951).

In order to consider how subjectivity affects the field of architectural sketches, it is clearest to distinguish immediately between the sketch as a physical object, or artefact, on the one hand, and sketching as a physical and mental process which develops itself

Fig. 42: Design sketch for a museum in Shiraz, Iran (Aalto 1969).

over time on the other. Although one is the outcome of the other, and consequently most significant factors apply to both process and product, this distinction helps to clarify the different ways in which subjectivity effects how we interpret sketches and how one learns through the sketching process. The topic is therefore divided into two parts and although many issues relate to more than one category, the fundamental characteristics of each are explained. Sketches as artefacts, and sketching as a process for analysing place are now considered in more detail.

Sketches as artefacts

Sketching and the analysis of sketches has long been used in fields related to psychology for the simple reason that a drawing reveals as much about its author as about the subject matter portrayed. This subjective aspect which is inherent to all sketches, and indeed to some extent exists in all forms of representation, comprises a variety of elements. Inevitably each individual has their own point of view which colours their view and expression even though they may not be consciously aware of its influence. This initially subjective approach may then be objectified in the form of a sketch (Fig. 41, Fig. 43). The sketch as an inscribed artefact contains the information and ideas previously determined by point of view and attitude and records them in a fixed external format.

Fig. 43: Acropolis, Athens (Jacobsen 1956).

This inscription does more than simply save a collection of information and ideas. It organises them into a visual order establishing relationships and hierarchies between parts. It becomes a statement of ideas which may then be shared and criticised by others. The sketch as an artefact becomes an objective statement in its own right. Once ideas have been stated they become objective and can become conscious and intentional.

The architect's drawing gives a particularly personal insight into the ideas and visions which shaped their designs and plans. Design drawings trace "the development of their thoughts (and) the memories which shaped their culture and fed their imagination" better and more closely than any other kind of document.[19]

Moneo writes that architectural representation already contains a reduced version of future reality. Drawing is the first construction of architecture: for the architect, drawing means literally

19 Ponsi, A., 2014. Citation from foreword. In: Abrams, 2014.

constructing his architecture (Moneo & Cortes, 1976). Consequently the intentions behind architectural design remain captured in an architect's drawings, and may therefore be read to reveal ideas which may be less clear in the architecture finally built. As a result, Moneo considers that the drawing ends up as an autonomous object independent of its author. His "Commentaries on the drawings of twenty architects" although apparently based on drawings alone, ends up as a set of considerations about the larger architectural ideas and strategies of the drawers - studying the drawings has allowed a deeper understanding of the architecture that they reflect.

However, the original intentions behind a design or a sketch can never be known in full, as the decisions made whilst sketching depend on such a complex interaction of different thoughts and ideas. This is important because through expressing subjective and perhaps unconscious ideas in an objective format, these ideas, whether inspired by the intuition, the subconscious or just by mere chance, are brought within the grasp of intentional design.

In considering architectural sketches, it is important to make the distinction between sketches which are concerned with architectural issues and those which are purely graphic depictions of the visual field. The former intend to investigate and uncover the underlying essence of the subject, the latter, although perhaps visually more attractive, are concerned with superficial appearance or perhaps other matters more distant from the structuring concerns of architectural design. Jorge Sainz (2005) differentiates between architectural illustration and architectural drawing through the intentions which underlie the image. He uses the example of an image of a building facade cast on a Renaissance coin which represents a physical likeness of its subject, but does not convey the ideas and intentions behind the design in the way that the architect's sketch would do. This is often a difficult distinction to make, and there is no definitive cut off point between the two. Nevertheless, perhaps it is summed up best by Marco Frascari (2011) who uses the terms trivial and nontrivial sketches to distinguish between drawing which explores the ideas within a particular subject, and drawings which merely intend to depict a superficial visual appearance of the subject alone. In other words, in architecture, the nontrivial sketch attempts not just to describe the visible form of the building, but rather, to convey the underlying principles behind its design.

It is important to note that aesthetic accomplishment is of minor

Fig. 44: Travel sketch from Morocco (Aalto 1951).

Fig. 45: Design sketch for town hall at Saynatsalo (Aalto 1951).

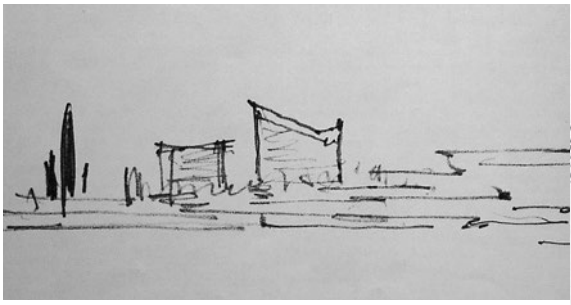
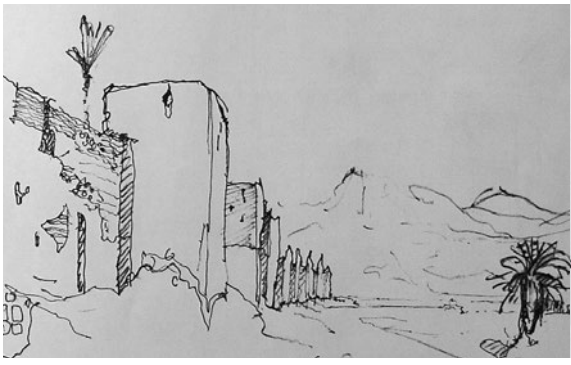


Fig. 46: Travel sketch from Marrakesh, Morocco (Aalto 1951).



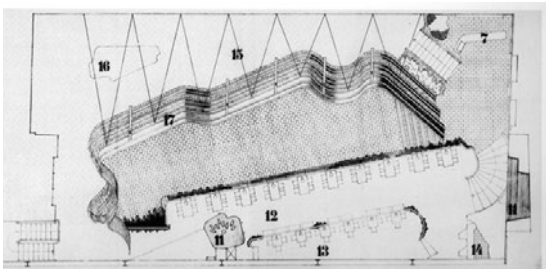


Fig. 47: Plan of curving screen, Finnish Pavilion, World Fair, New York (Aalto 1939).

Fig. 48: Vase (Aalto).

Fig. 49: Travel sketches from Morocco (Aalto 1951).

importance in the nontrivial sketch being far less significant than the thought which has gone into its drawing. This is not to say that such sketches need necessarily be aesthetically rough, simply that the priorities and motivation behind the sketch are very different.

Some architects consider that beauty in sketches can be highly misleading, distracting attention away from the architectural ideas represented and potentially clouding the critical judgement of these ideas (Oeschlin, 1982b. Opinion of Karljosef Schattner). Siza explains that he often chooses to draw with a biro in order to avoid being carried away with the aesthetic appeal that a pencil line can have.[20] This wariness of virtuosic ability actually obscuring the deeper merit of the idea itself has been shared by many artists from different fields, Joseph Conrad preferred to write in English instead of his native Polish believing that the difficulty this posed prevented him relying too heavily on the eloquence of his language at the expense of the ideas he intended to express (Conrad, 1923). On the other hand as Jorge Sainz (2005) claims, good architectural theory should stand up independently of the type or quality of its graphic representation. There is no relationship between the aesthetic quality of sketch and the quality of the architecture represented. Nevertheless Sainz does note the frequent correlation between an architect's way of drawing and formal nature of their architecture, as the examples of Aalto and Mies illustrate (Fig. 44, Fig. 45, Fig. 46, Fig. 47, Fig. 48, Fig. 49).

In *The Thinking EYE*, Klee wrote that "Art does not reproduce the visible, but makes visible" (Klee, 1961. p.76) referring to the capacity of art to reveal an underlying meaning or logic, which would otherwise go unperceived. Concentrating then on nontrivial architectural sketches, these are taken to contain some sort of information about the principals underlying the subject matter portrayed. The sketch creates a critique of them, what they are, how they determine the interesting qualities of the object. These principles are conveyed by the way in which the sketch is drawn. Kahn's emphasis on the irregular monolithic nature of the massive Acropolis buttresses, contrast with the repeated modular nature of Jacobsen's interpretation of the same wall (Fig. 41, Fig. 43). Nevertheless both points of view are equally valid ways of seeing and understanding the way in which the subject matter has been composed and constructed. However it is equally clear that the wall in question was never designed intending to convey either one of these ideas. Each sketch shows an idea constructed

20 Perez Oyarzun, F., 2001. Conversation, Cambridge University

by the sketcher. Apart from merely illustrating ideas inherent in other things, sketches create meanings of their own. The sketch is a statement of its own ideas which although it may not contradict the logic of the building in question, transcends this through showing the values which the sketcher projects onto the architecture.

However, although point of view in this sense appears to distort each individual's perception of reality, it is equally reasonable to consider that point of view is a mechanism which determines the individual and their thoughts and not vice versa. Point of view becomes a way of making sense of reality rather than just projecting on to it what one wants to see. The sketch presents a structured, or reasoned out, point of view for others to understand and share. This allows others to make sense of reality through the particular point of view in the same way as the author. As a result the crucial point about sketches as objects is that the meaning lies in the sketch rather than in the subject which has been drawn. Antonio Moro mentions Borges and Pallasmaa in his essay on Santa Caterina, where he explains that the true meaning is in the perception of the thing rather than in the thing itself (Moro, 2015). Hence the flavour is in the contact of the apple with the palate, not in the apple itself. Equally the meaning of a place may lie in the interpretation of it – in a sketch – rather than in the place itself. So the interpretation of a place conveyed by a sketch gives the sketch a meaning of its own independent from the subject matter of the place itself.

The subjective side of sketching-thinking is manifested in the point of view which a drawing contains. The point of view determines the outcome of the sketch hence the sketch is an illustration of the point of view. However due to the learning process which thoughtful sketching entails, the act of sketching is also capable of informing and improving the point of view. This process of idea construction – the selection and addition of elements - is based to a large degree on subjective criteria as described in the following section. However the resulting sketch is an inscription which fixes the idea in an objective format so that it may be shared critically with others (Latour, 1986). Nevertheless, this resulting object is affected by subjective criteria based on the sketcher's individual point of view.

The way in which the sketch is drawn presents an ordered system of knowledge (Foucault, 1970). Through including or excluding things observed, adding imaginary parts or removing existing

parts, the sketch assembles a particular selection of elements. More significantly, these elements are composed in a specific order on the page, constructing relationships of many types between themselves. This overlay of interrelationships between parts may build up into a complex network of connections and separations which all together form a particular idea of a building and of a place. The different elements selected or ignored in the case of the two Acropolis sketches (Fig. 41, Fig. 43) are relatively clear, however apart from the physical aspects observed on site there is also the relationship between objective reality and the imagination of the sketcher. Le Corbusier's sketches of the Acropolis repeatedly demonstrate how at times he drew what he found, whilst increasingly as his sketches progress, he adapts what he sees in order to convey the idea he is developing[21].

As already discussed, in combining different ideas – from different moments in time from relatively objective logic and subjective reason or from local context of existing reality with the hypothetical introduction of foreign ideas – sketching demonstrates a point of view. Apart from the subjectivity of the ideas themselves, the way in which different ideas are selected and combined is deeply subjective. The way in which they are combined demonstrates the designer's point of view. The act of sketching becomes useful because it can state this subjective point of view. In so doing it becomes fixed and externalised, and so may be compared and evaluated objectively against other points of view, and shared with others. As such the sketch helps to control and objectify a subjective point of view making it a more useful and less wilful part of the design process.

The nontrivial sketch is the statement of ideas. These are contained within the drawing but composed by an independent mind through structuring real and imaginary elements into particular relationships. Understanding an architectural sketch in this way is important for several reasons. First because it validates the truthfulness of sketching – the idea conveyed may be coherent and genuine regardless of how accurately the image follows objective reality. Secondly, the ideas constructed in a sketch statement help to give structure and logic to the sketcher's individual and subjective point of view. Thirdly, stating this point of view in a fixed medium allows it to be objectively considered and critically discussed by others. The sketch statement is a vehicle for sharing conceptions of place clearly, allowing others to understand and make use of them. The point of view in fact becomes

21 Daza, 2015. Conversation.

more useful, rather than less, on account of its subjective and therefore individual and potentially innovative ways of seeing.

If sketches can state ideas of their own, independent of those ideas held in the subject matter itself, another question arises about how intentionally these ideas have been created?

Apart from the way the point of view influences a sketch, deliberate conscious intentions may affect any aspect of the drawing. This may be the initial interest which determines the composition of the drawing, or a deliberate decision to represent elements of the view in a particular way. Such deliberate and conscious decisions may be focused in one direction or another according to the choice of the sketcher.

However, from looking at a sketch, can the original intentions behind it ever be known? Even if the process of sketching where entirely rational, it would be impossible to know the complete chain of cause and effect which had determined its outcome. However rational and painstakingly logical one tries to make the process of sketching, the complexity of influencing factors overwhelms any rational path of decision making. The concept of bounded rationality as described by Herbert Simon is a more realistic way of understanding the intentions and decisions behind the creation of a sketch.

“The principle of bounded rationality [is that] the capacity of the human mind for formulating and solving complex problems is very small compared with the size of the problems whose solution is required for objectively rational behaviour in the real world - or even for a reasonable approximation to such objective rationality.” (Simon, 1996, p.111.)

To compensate for this unfeasible degree of complexity, decisions along the sketch process are determined by alternative criteria. These may be to varying degrees subjective, subconscious or emotive - the balance between these is constantly changing during the course of the sketch. The end result is never clear during the course of design or that of a sketch. Inevitably therefore the ideas which appear in a finished sketch will have evolved to some degree during the course of its creation, partly through conscious intention, but also through chance and unconscious intuition. The sketch is useful for analysis, design and innovation of all types precisely because of the way in which it remains sufficiently flexible to integrate deliberate decisions and chance

occurrences into a single coherent idea. For design, the unintentional discoveries in a sketch are just as significant as intentional ones, and potentially more so. The most important thing for the sketching architect is how they are discovered and developed.

However, far from being negative aspects, these three factors can provide a means of coping productively with incalculable situations, allowing mechanisms other than rational intention to develop ideas and seek solutions. It is therefore less realistic to consider sketches in terms of a set of intentional conscious decisions, but rather as a development of potential opportunities, some deliberate and others not (or at least not initially). When sketching place, these intentions are best left as flexible as possible so as to pick up whatever inspiration from the site may be useful. In fact a lack of intention can be crucial for engaging successfully with place - a lack of intention can actually be extremely important. Siza describes his impression of Picasso painting as a kind of detonation of ideas, chance occurrences which are picked up on and developed into creative opportunities as and when they appear.[22] The art lies in finding them and developing them without imposing too strict a logic upon them which might prevent them evolving to their full potential.

To summarise, in completed sketches, the sketcher's original intentions can never be known. There is in fact a lack of consensus amongst architects as to whether original intentions are in fact present in a first sketch at all, or even when the first sketch of a design idea actually occurs. For research, this means that finding intentions in original sketches is best approached through comparing sketches in sequence.

…

The finished sketch shows a statement of ideas which are organised in a particular way according to the point of view and deliberate intentions of the sketcher. The ideas stated in the sketch are subjective, in that they have been constructed by the mind of the sketcher and are not inherent to the architecture being drawn. However, the fact that they are inscribed onto paper, externalises these ideas in the format of an object. These ideas may then be discussed and shared amongst others no longer controlled by the subjective gaze of their author.
The process of sketching

22 Alvaro Siza, transforming reality. Interview by K. Frampton. 2010 [DVD] New York, Michael Blackwood Productions.

Having considered the completed sketch as an autonomous object and the role played by subjectivity both in the intentions of its author, and in the subsequent interpretation by a viewer, the discussion now turns to the influence of subjective ideas on the process of drawing.

Our experience of our environment is varied, dynamic and continuous, characteristics which all leave traces in drawings, even though in essence drawing is the reverse of each (Sainz, 2005). The process of drawing by hand is a craft like activity. It involves adding, subtracting, selecting and re-dimensioning aspects of what one observes in order to emphasise the important things and develop an architectural idea. These are all reasoned out subjectively during the process of sketching and serve a number of functions in the design process.

One fundamental reason for drawing is the need to give shape and form to one's thoughts (Schön & Wiggins 1992; Goldschmidt 2003). This may either be in order to be able to communicate abstract ideas to others in a reasonably precise way or to help understand one's ideas for one's own benefit. To quote Scarpa on drawing to visualise ideas: "I want to see things, that's all I really trust. I want to see, and that's why I draw. I can see an image only if I draw it" (Dal Co 1985 p.242). In other words, drawing provides a means to objectify subjective thoughts and intuitions. Through fixing a partly subjective interpretation of a place on paper, both the sketcher and others can share its particular way of understanding the place. Once given form on paper, these subjective responses may then be evaluated critically. The judgements which arise from the drawing can suggest improvements which can then be introduced in the next phase of the sketch. In terms of place, the way the drawing represents place may be improved gradually; vague or wilful ideas are reformed into reasoned observations and responses.

Relative to photography which captures an image of everything that falls within the field of vision, the in-situ sketch is a reductive process whereby highly complex reality is selectively observed and distilled into images which concentrate their attention on certain specific aspects of the view. However it is equally important to consider that drawing involves adding as much as reducing, of imagining and enhancing those aspects which may not be directly visible but which enhance the actual impression of place. As Paul Valery wrote about the drawings of Degas:

"observar es en su mayor parte imaginar lo que se espera ver, imaginar la evidencia", "Al dibujar es preciso querer para ver, y esta vista deliberando tiene el dibujo como fin y como medio a la vez".[23]

Sennett explains communicating and listening skills in a similar way: the listener must be capable of filling in the meaning which remains unspoken in order to maintain the coherent logic of a dialogue (Sennett, 2013). The sketch provides this opportunity to appropriate ideas from one's surroundings through selecting, adding and re-dimensioning them into a new image. Sketching can investigate the real organisation of architecture and its underlying structures not merely its visual characteristics. As Frascari writes, "Real architectural drawings are not illustrations but pure expression of architectural thinking".[24]

The way in which ideas can be improved through this graphic process of correction and refinement is of considerable interest in cognitive research. Goldschmidt (2003) describes it as a dialogue between sketcher and paper where the process of evaluating the drawing critically, comparing it to reality and the desired effect, helps the sketcher to modify the drawing and at the same time clarify or improve the ideas behind it. In terms of a sketch of place, this cycle of drawing, evaluating and then modifying a sketch in-situ, gradually builds up the sketcher's understanding of the underlying structure of place (Navarro Baldeweg, 2013).

In outline, the process of sketching may be explained as a combination of visible processes – looking and drawing (gestures, mark-making) and interrelated processes of multisensory perception and mental reflection. All of these internal and external processes develop in a complex interconnected way, each affecting the development of the rest. The "sketch process" refers to this entire system. The fact that travel sketching is carried out in-situ is particularly valuable because it immerses the sketcher in place and engages both through the senses and the mind directly with the environment. Apart from the manual drawing side of the cycle, it is equally significant to consider how the sketcher perceives and understands his surroundings. This sheds light on how the sketcher then formulates responses to this environment,

23 Valery quoted in Trillo, 1993. "Observing is to a great degree imagining what one hopes to see, imagining the evidence", "Drawing requires the desire to see, this deliberating vision has the drawing both as its goal and as its medium at the same time." Translation, Sebastian Harris.

24 Frascari M. Critical Conversations in Media, Drawing as Theory, ACSA Annual Meeting, 2001, cited by Smith 2005, p1.

and how the process of sketching can help to improve these responses.

In his essay on the visible and the invisible, Merleau Ponty (1964) describes the nature of perception. He explains how we perceive the nature of things through noting the differences between them. He therefore considers that things, physical objects (the "visible"), are perceived through comparing them first to their surroundings but also to the observer's mental network of ideas of other equivalent things (the "invisible"). This network is built up from the viewer's experience - in other words it is partly the memory of things experienced in the past, but it also incorporates elements of the imagination, things which the observer may have no direct experience of but are close enough to be able to construct an idea from.

Merleau Ponty extends this intertwining of the "visible" and the "invisible" to explain the relationship of the human being with the surrounding environment. The human body becomes the centre of perception, but it relates to its surroundings actively as well as passively. This happens in part through the intertwining of subject and object through the senses. The separation between place (object) and observer (subject) is reduced by the fact that all the senses are simultaneously immersed in one particular environment.

The entire existing world can be seen as a peripheral blur with a particular zone of clarity - we only see and comprehend things clearly when we consciously focus upon them. When we stop concentrating they recede again into "atmospheric existence" (Merleau Ponty, 1964). Merleau Ponty describes the "visible" as physical, tangible things which are continuous and inter-related. We perceive them through picking out the points of difference between things. For example, our perception of a particular colour depends on the relationship of that colour to its surroundings. By focusing on the colour itself we perceive it as a point of difference to the colours around it, and relate it to its context. The colour forms part of a constellation network of other colours - "it is a certain node in the woof of the simultaneous and the successive" (Merleau Ponty, 1964).

He then introduces into perception his concept of the invisible – the "idea" of things. Apart from the network of visible colours within view, any particular colour also fits into our mental network of all experienced and imagined tones of that colour. A visible "object" is not an indivisible, hard, independent, objective thing. "It is less a thing than a difference between things…a

sort of straights between exterior horizons and interior horizons" (Merleau Ponty, 1964). Mentally, our perception of the world around us intertwines subject with object. We perceive memory and imagination, the past and the future, through the recollection or prehension of the senses (Sennett, 2008). So, the mental framework built up from not only lived experience but also from the imagination forms part of this same intertwined relationship of the self with the surrounding world.

Merleau Ponty extends his argument further explaining that whilst vision is a matter of actively projecting one's gaze, and focusing on an object, these objects are also actively affecting the observer. The surrounding objects project the image of themselves at the viewer's retina. Through perceiving objects, the observer is influenced by what he sees. The viewer's gaze makes the observer into an object altered by his surroundings. In this case, the invisible is no longer the unchanging personal gauze of Ortega y Gasset's "point of view", which retains a limited selection of reality (Ortega y Gasset, 1964). As objects affect us through our perception, our point of view is inevitably altered – as we learn more, our mental perspective broadens, and our opinions evolve. The gauze is endlessly changing shape.[25]

From Liebniz on, the point of view has come to be seen as a mental construct more than a single focused optical perspective. Liebniz's contribution was to suggest that this mental construct is made up of a great many observations and viewpoints (Broad 1975. p44; Deleuze 2006). Sketching in situ states the opinion formed from overall experience, that of searching for a composition and learnt from the experience of other drawings.[26] As a result of this complex network of thoughts each leading on to another, the sketch ends up reflecting and presenting an opinion

25 "It is a pity indeed to travel and not get this essential sense of landscape values. You do not need a sixth sense for it. It is there if you just close your eyes and breathe softly through your nose; you will hear the whispered message, for all landscapes ask the same question in the same whisper. 'I am watching you – are you watching yourself in me?' Most travellers hurry too much...the great thing is to try and travel with the eyes of the spirit wide open, and not to much factual information. To tune in, without reverence, idly -- but with real inward attention. It is to be had for the feeling...you can extract the essence of a place once you know how. If you just get as still as a needle, you'll be there."
— Durrell, L., 1969. Spirit Of Place: Letters And Essays On Travel. Penguin, New York.

26 An example is Le Corbusier choosing to draw the main facade of the Acropolis only after having carried out a graphic investigation both inside and outside the monument. See Le Corbusier, Voyage to the East, Carnet 3, p123

built up gradually and critically during the course of the sketch. It becomes a statement of a set of many ideas. The effort of thought which sketching requires strengthens the development of point of view. This has a significant influence on design of architectural projects using travel sketching.

Point of view then determines the observer's perception of the world about them. But it may equally be understood the other way around, defining how the observer can express himself. The point of view which has formed a particular sketch has done so both through shaping the sketcher's observations of the outside world but also through shaping the expression of the sketcher's thoughts. Because sketching involves both observation and proposal, it involves both sides of point of view – external observation and internal reflection. Through drawing, the sketcher is affected both by observing place and by proposing the right way to represent place. Rather than limiting the way in which the observer perceives things, sketching in-situ allows this way of seeing to be compared directly with objective reality. This process of comparison and reflection gradually refines the point of view adapting it to the specific characteristics of place giving the sketcher the opportunity to evaluate and refine the point of view. Consequently, sketching is not limited to just drawing what our preconceived point of view allows, but actively expands and modifies it according to what the sketcher sees. Drawing strengthens the reversible link between the sketcher and the environment helping to mould and improve the point of view, developing their relationship with place through a reasoned process.

Point of view is therefore not just the result of the way one represents reality, it is also equivalent to the lens through which we understand reality. It determines how we see and therefore how we think. The travel sketch clearly demonstrates a particular point of view (Fig. 41, Fig. 43). However this is not just the way in which ideas are expressed (the output of the final representation), but it also determines how one absorbs and perceives one's surroundings. In other words the point of view determines what we are capable of discovering and understanding of the world around us. Sketching in situ helps to develop and deepen this point of view broadening one's observation and maturing one's opinions.

Point of view is affected most clearly by the discoveries which the act of sketching so often uncovers. The process of looking,

thinking and making can change the sketcher's perception and view of the world around them. Whilst drawing, new ways of seeing come to light, revealing new ideas in things which had previously remained inert. This process of discovering reveals aspects of place which were previously existent but went unnoticed. Liebniz referred to this kind of enlightenment as apperception, where the change in perception is due entirely to a change in the viewer's way of looking and not in the object under scrutiny (Haakonssen, 2006. p.292). This may be explained through sketching helping to focus the point of view in a different way drawing attention to different aspects of place. The result is that after sketching, one notices the previously existing in far greater detail and sometimes in an entirely different light.

Recalling Merleau Ponty's description, within a general atmospheric haze of reality, the observer perceives only a small zone in sharp focus. Apperception is when previously blurred things come into focus allowing us to concentrate on them. This does not necessarily result from rapt attention (Benjamin, 1936), but is often stimulated by the slow repetitive process of observation combined with the critical and intentional viewpoint of the sketcher. Sketching may help to notice things which can then be seen with attention. Sketching provides the ideal conditions to transform subjective intuitions into new ways of seeing things and places. This may be the result of the mental exertion required in the interconnected process of looking, thinking and proposing, and also to creating associations with other things which spark new interest. As Siza puts it, the process of sketching can "detonate" ideas, discovering new ways of comprehending the surrounding environment[27]. One purpose of sketching then is to discover new things about place through unveiling what was already there - to notice objective things, discovered by means of a highly subjective process.

The capacity that sketching has to suggest new ideas, both in raising unforeseen questions and solutions, is one of its most important benefits to the design process. Smith (2005) explains this through the sketch being a "conveyer of likeness". The associative memory of the sketcher recalls other ideas which visually resemble the sketch thereby "suggesting" new ideas. In effect, the act of sketching serves to extract thoughts and interpretations already held within the author's mind. Lapuerta (1997) suggests that the ambiguity which is so characteristic of sketches actively

27 Alvaro Siza, transforming reality. Interview by K. Frampton. 2010 [DVD] New York, Michael Blackwood Productions.

encourages multiple and varied interpretations. A sketch may in fact suggest more precisely because it remains in an unfinished state.

Picasso uses the act of drawing to discover an idea without predefined thoughts. Siza considers the same can occur when drawing architecture: “I have seen documentaries about Picasso where the genesis of the work appears as a line which has no predefined idea, but instead acts as a detonator of the action. In my case this often happens with drawings. Perhaps this happens differently for other architects...In any case, one cannot imagine without supporting instruments.”[28]

García Navas (1997) analyses a similar process through which Paul Klee drew his sketch of *Two Soothsayers Conversing* (Fig. 50, Fig. 51). Garcia Navas even suggests the possibility that the drawing was started by Klee’s very young son and then continued by the father. Klee starts off almost doodling, with repetitive nervous gestures as if following no deliberate intention other than an ingrained physical reflex. He then gradually discovers the drawing in a series of increasingly definite marks. Klee does not anticipate themes but looks for them whilst drawing. Improvisation is key to his manner of drawing and to the way in which his drawing evolves and take shape. Like Klee, each author frequently sees more in a sketch than that originally intended. The difficulty for applying this to the design process lies in how to appreciate and evaluate newly suggested ideas, and then to develop them further in subsequent sketches.

Fig. 50: Two Soothsayers Conversing (Klee 1906).

…

To conclude, through combining subjective and objective inputs, the process of sketching in-situ can actively expand and modify the point of view and consequently improve one’s understanding of place.

It does so through harnessing subjective intuition with the subconscious and improvised response to chance to produce ob-

28 Siza, 1995, quoted in Angolotti P. 1998, in VII congres EGA 1998 p223. “He visto algunos documentales sobre Picasso donde la genesis de la obra se produce como un trazo que no contiene una idea previamente definida, sino que actua como detonador de la acción. En mi caso esto se produce a menudo con un dibujo. Quiza en otros arquitectos se produce de otra manera... En cualquier caso, no se puede imaginar sin instrumentos de soporte.” Translation into English by Sebastian Harris

jective statements of subjective ideas. Sketching strengthens the reversible link between sketcher and place through holistic human-centred experience. The controlled development of subjective ideas provides a logical means of reasoning of great use for design, both in terms of establishing authentic connections to place and for reaching innovative place-based responses to design questions.

Fig. 51: Two Soothsayers Conversing, Detail (Klee 1906).

CHAPTER 3

TIME

"The contradiction of time that passes and the identity that endures, my stupor at the fact that time, our substance, can be shared"

Borges 1996, vol 2, Prologue to *El otro, el mismo*, p.235.

In his commentaries on architect's drawings, Moneo (1976) writes that architectural representation already contains a reduced version of future reality. The design drawing of the architect is focused on its subject in a future state – time is therefore a fundamental factor. Time also has a fundamental effect on sketching and is conveyed in many complex ways in the completed sketch. Time determines both the purpose of a sketch, and the sketch's ability to influence the design process through incorporating site conditions into design work. Equally, the use made of site sketches in design alters as their interpretation evolves over time. The intention of this section is to refocus the discussion of architectural sketching on its role for structuring time within the design process and specifically in designing place. A discussion of the relationship between time and sketching may help to un-

derstand more clearly how in situ sketching may benefit architectural design which upholds and positively transforms place. This can be organised according to the different timescales involved.

At the smallest scale, the fundamental nature of a sketch, as opposed to other forms of architectural representation, is due to the fact that it develops gradually over time. The time-based cycle of observing, thinking and mark-making is repeated many times during the construction of a sketch in-situ. With each repetition, the drawing builds up layer upon layer of marks, and the sketcher's comprehension of place deepens accordingly.

On a larger scale, sketching can provide a means to structure ideas and the development of thoughts across time, allowing architects a flexible means to control and record the unpredictable evolution of the design process. This structure helps varied ideas to develop according to a relatively reasoned and logical process in search of a design solution. By visualising simple, quick unfinished impressions of hypothetical future stages of a project, the architect can evaluate and refine his proposal without becoming bogged down in over-specific limiting depictions. The convenience and rapidity of the sketch develops in time with the speed of the designer's thoughts and can accelerate the pace at which a design matures. One purpose of design sketching is to push the rate of design development along, forging each new iteration simply and quickly. At the same time, rapid visualisations of design ideas can provide a chronological record of the stages through which the design has passed allowing a path of development to become clear, and demonstrating the direction and magnitude of design changes.

On a more general level, sketches have been of great use for fixing information at a particular moment and also when seen in sequence, as a chart of the chronological evolution which they record. Inscriptions are intended to freeze information about a subject at a particular moment in time. Although other media do the same, the sketch, given its highly selective nature records a greatly reduced spectrum of information. Any kind of inscription is contextual, its interpretation depends on the context within which it is deciphered. It is interesting to consider how this differs over time to the equivalent interpretation of a concurrent photograph.

On a larger scale again, design is fundamentally a time-focused activity. Its aim is to foresee and organise changes for the future

which will improve the conditions of the present. It must also be developed to suit current conditions and to fit within a given context of one kind of tradition or another. Sketching, and architectural drawing in general have permitted the profession of architect to designing before building freeing the architect from continued supervision on site and allowing greater independence between the processes design and construction in terms of both time and location.

The concept of place depends to a great extent on time. The relationship between sketching and time is consequently of great use to architects designing projects to reveal and transform the qualities of place. Therefore sketching is considered here as part of the design process which focuses above all on place. Design and the role that sketching plays in it, is approached as a forward looking process, and not treated as a subject for historiographical analysis. The aim is to explain the relationship between place and architectural design through focusing in greater detail on sketching and time.

In order to clearly distinguish between different scales of time, and the utterly different ways in which it relates to in-situ sketching, time is discussed in four parts. First, time in the construction of a sketch, second how the sketch can help to control the design process over time - given the inevitable differences between projects as well as between architects, this section is discussed with three different examples of site/design sketches which tend towards three different extremes, in order to describe the boundaries within which all other place-design sketches operate, third how the sketch can fix information and fourth how the sketch is fundamentally connected to the basic time-based structure of design.

Time in the construction of the sketch.

Art is about making visible an experience not just graphically copying an instant (Riley, 2002). Unlike photographs which are made effectively instantaneously, sketches are built up over a short but sustained period containing a combination of many individual observations, interpretations, proposals, evaluations and revisions. This means the sketch will show a composite presentation of these observations rather than one single moment in isolation. Observation is extended over time. John Berger (2008) describes this repeated observation in one of Vermeer's paintings which he demonstrates is the combined result of a thousand glimpses rather than any one individual look. This repetition gradually removes singularities and conveys a more overall, gen-

eral picture. Vermeer ends up painting the view of a canal which has never actually existed at any point in time, however it shows a vision of the canal which is more like the human perception of the canal than any one of those isolated instants. As a result of this, Berger claims that Vermeer manages to capture the essence of the canal in a far more realistic manner than a photograph could ever achieve.

Whilst Berger refers principally to the thousands of observations, Pallasmaa (2009) discusses the cyclical process of interpretation, mark-making and revision that goes with it which he describes as the "layered exposure" of the construction of the sketch. It involves the cyclical repetition of observing, drawing, evaluating and revising. This not only refers to the integration of many observations, but also to the many individual interpretations as well as the equal number of consecutive evaluations. This cyclical repetition allows the drawing to build up intensity gradually, each layer being judged in relation to the rest rather than just piling up randomly. This gradual layering of this build up is significant, because it shows that rather than the final result conveying some kind of average drawn from a great many observations, the repetitive cycle involves critical revision. This means that with each cycle, the sketcher learns more about the subject matter. Observations later on in the process are more focused than at the beginning. The process of sketching over time becomes a learning process. Each reflection has been critically evaluated and compared directly to reality in situ before being modified and added to in order to improve it. This is an iterative process of trial and error measured against the benchmark of the physical experience of immediate reality. The end result shows the maximum level of knowledge attained rather than an average of many isolated observations. The time taken in sketching - and consequently learning - is therefore crucial to the positive impact it may have upon the design process.

The two primary roles of the design sketch are to illustrate ideas which have already been formed, and also to work out ideas which are still evolving, leading the sketcher/designer's thoughts towards new ideas. The principle difference between these two modes of sketching depends on whether it is the sketch or the thought that comes first. However, even this distinction is often unclear, as sketches starting out with one aim may combine aspects of the other. As Goldschmidt (2003) notes, sketching is particularly suited to idea development as its speed and flexibility allows it to progress at approximately the same speed as the

designers thoughts, allowing the growing image to keep pace with the conceptual evolution of the design. As in the case of Paul Klee's *Two Soothsayers Conversing*, (Fig. 50) the drawing starts out as an exploratory sketch, before gradually deciding on a particular path and ending up illustrating parts of the drawing which were clearly already understood (Garcia Navas, 1997). The possibility of combining preformed ideas and seeking out new original ideas in the same drawing, and hence the ease of switching from one to the other, gives great flexibility to the design process, providing the potential for gaining inspiration from precedents and incorporating it into new designs. Travel sketches work in the same way - they may illustrate existing things, or combine aspects of imagined future alternatives, in which case they become in effect design sketches. In other words, travel sketches can both illustrate the existing present and discover new future possibilities, fusing times and places together. The writer Orhan Pamuk describes this double action of observing and guiding when drawing.

"After a time, my hand had become as skilled as my eyes. So if I was drawing a very fine tree, it felt as if my hand was moving without me directing it. As I watched the pencil race across the page, I would look on it in amazement, as if the drawing were the proof of another presence, as if someone else had taken up residence in my body. As I marvelled at his work aspiring to beome his equal, another part of my brain was busy inspecting the curves of the branches, the placement of mountains, the composition as a whole, reflecting that I had created this scene on a blank piece of paper. My mind was at the tip of my pen, acting before I could think; at the same time it could survey what I had already done.This second line of perception, this ability to analyse my progress, was the pleasure this small artist felt when he looked at the discovery of his courage and freedom. To step outside myself, to know the second person who had taken up residence inside me, was to retrace the dividing line that appeared as my pencil slipped across the paper. Like a boy sledding in the snow."
Pamuk 2003, *Istanbul: Memories and the City*, p.135

Structuring the design process over time

Design is a time based process which develops in stages over time. The aim of design sketching is to help imagine a potential future, and to plan this out before the moment of execution

– the motive for sketching in design is to envisage this future state. According to Herbert Simon (1996), design is a matter of changing existing situations into preferred ones. It is a case of improvement, and usually one which is planned out (to some degree) prior to its execution. The purpose of sketching whilst designing is therefore to think about the future, and the possibilities for transformation. Fundamentally, design is all a question of change at a future date. Hence the issue of different timeframes is implicit in the act of design. Any design sketch refers to a possible future state. Its role may be to propose a form for this future state or to test out and evaluate it, but in either case the design sketch is not a hypothesis of how something already is, but a suggestion of how it could be. Design sketches are evaluated according to certain criteria specifically intended to guide the design towards achieving improved results. Time, or rather, change over time is an essential characteristic of the design process – designs are worked upon and improved gradually in steps, and not resolved in an instant flash of inspiration. To make best use of the design process it is beneficial to give this evolutionary path some kind of structure across time without limiting its development to preordained stages. Sketching is a method which can organise and improve ideas in a relatively structured fashion whilst still allowing sufficient flexibility to adapt to unforeseen circumstances and opportunities. Design sketching works as an iterative method for developing design solutions step by step, making ideas visible which had no form previously. Some of the particular benefits of sketching in terms of time are the ease of modification, which is fast enough to keep up with pace of thoughts, and fixing ideas or observations rapidly, allowing further thoughts to be added, building up complex ideas through the accumulation of comparatively simple ideas over time.

One way in which sketching helps to understand, and from there to react intelligently towards time, is through allowing comparison. Comparison both between different things, and between different moments of time. Once ideas may be compared over time, this makes it possible to evaluate them. This critical evaluation helps one decide which direction of change would be best helping to orientate the design process. Sketching helps this comparative thinking to evolve in an ordered way for a number of reasons: First it fixes information making this process visible and documenting it as it changes across time. It records the rate of progress allowing the comparison of thoughts at different moments along the thinking process (which would otherwise have been forgotten or modified). It can therefore help to sug-

gest lines of development, and to show up in retrospect patterns of design development over time which may in some way assist with evaluating the design process and understanding how it is developing, thereby helping to make more informed decisions over future proposals. Second, the cyclical process of thinking and reviewing makes it a self improving method over time. The complexity not only of observing reality, but also comparing and evaluating changes over time, is very large. By building up in stages, the layered exposure of the sketching process (Pallasmaa, 2009), allows one to understand and think about things of far greater complexity than would otherwise be achievable in one go. This process allows the sketcher's evaluation to feed back immediately into the drawing, refining the next step of the comparison and evaluation.

The design process itself is an iterative and indefinite sequence of steps – the route ahead only becoming visible one step at a time. Sketching helps to structure and guide these steps over time, developing and stating a path of reasoning along the length of the design (Goldschmidt 1991, 2003; Schon & Wiggins 1992a, 1992b). During design, the act of sketching becomes a method for finding and developing ideas, as a mechanism for assisting the fundamental creative process which requires both conscious thought and making. The principal aim of these sketches is to explore new opportunities for understanding or transforming ways of interpreting a particular subject – experimenting with fluid thoughts as opposed to purely illustrating preformed fixed ideas. These are sketches made with the intention of advancing through the uncertain process of design, enabling the architect to make informed choices about each step in the development of a project. The role that sketches serve in the design process differs depending on the stage at which they are made. Due to the high degree of ambiguity, sketches may be interpreted very differently from how they were intended when drawn. The same sketch may mean different things and serve different purposes depending on what stage in the design process it is considered.

This may happen at various stages of the design process. According to Paul Ricoeur, the three main stages of the design process are prefiguration, configuration and refiguration (Ricoeur 1990. Vol 1, p76). Each stages serves a different purpose, that of exploring and discovering ideas, working out and refining proposals, and finally representing these designs, and each makes use of different kinds of drawings according to its requirements. These are principally developed through different kinds of drawings.

Michael Graves (1977) refers to these as the referential sketch, the preparatory study and the definitive drawing.

Following this division into three parts, site sketching forms part of the initial stage of prefiguration, capturing information through a process of selection and ordering into an organised structure. Configuration is the design stage where the information gathered is transformed into the essence of the design solution, gradually working over ideas, revising and eventually fixing them in specific spatial and formal arrangements. Refiguration refers to the stage of producing a representation of the new project, allowing a visualisation of the future transformation which the project will create.

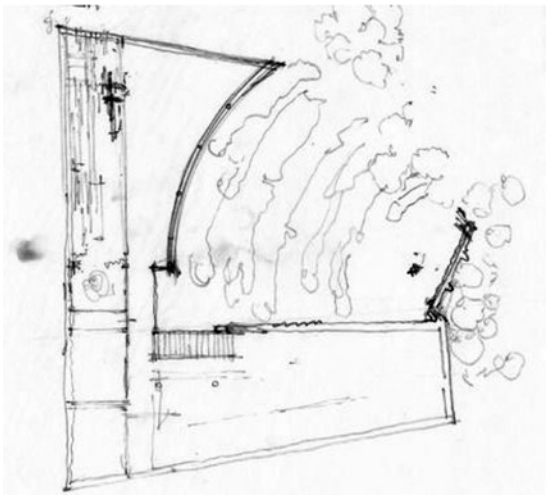


Fig. 52: Sketch plan for architecture studio, showing terraced patio in form of an open-air theatre. (Aalto 1955).

The sequence of these three stages from exploration to experimentation to representation may happen across the course of the entire design process, but it also occurs over a far shorter timescale across brief sequences of sketches. An idea may be sort after, then made to work and finally be drawn out in a handful of scribbles. However the design process is not a clear progression from one stage to the next. Designing with sketching is a non-linear procedure, one which returns back to exploratory design sketches at all stages. So although small groups of sketches, or even individual drawings, may follow the same overall characteristics, they do not necessarily occur in the same order (Schön & Wiggins 1992; Goldschmidt 2003).

Sketching can influence the rate of design development producing faster or slower iterations, repeating cycles between proposing and reviewing ideas. Over a medium time-span, Le Corbusier's sketches of the Acropolis show a similar progression over the course of a small group of sketches in his carnet made during two weeks in September 1911.[29] These start with exploratory drawings made from a similar viewpoint, experimenting with variations in the way of capturing and organising the site information. They then develop in a series of sketches of the entrance and Acropolis plateau focusing on the same primary elements, horizon, and proportion, even at the expense of naturalistic accuracy. Then finally once his ideas and conception of the buildings, landscape and place have settled into an ordered vision, he draws the main facade of the Acropolis showing the Parthenon in careful relation to the rest of the constructed and geological elements. This final sketch serves to illustrate a now fully formed idea.

29 Le Corbusier, Voyage to the East, Carnet 3, 1911, p98-127

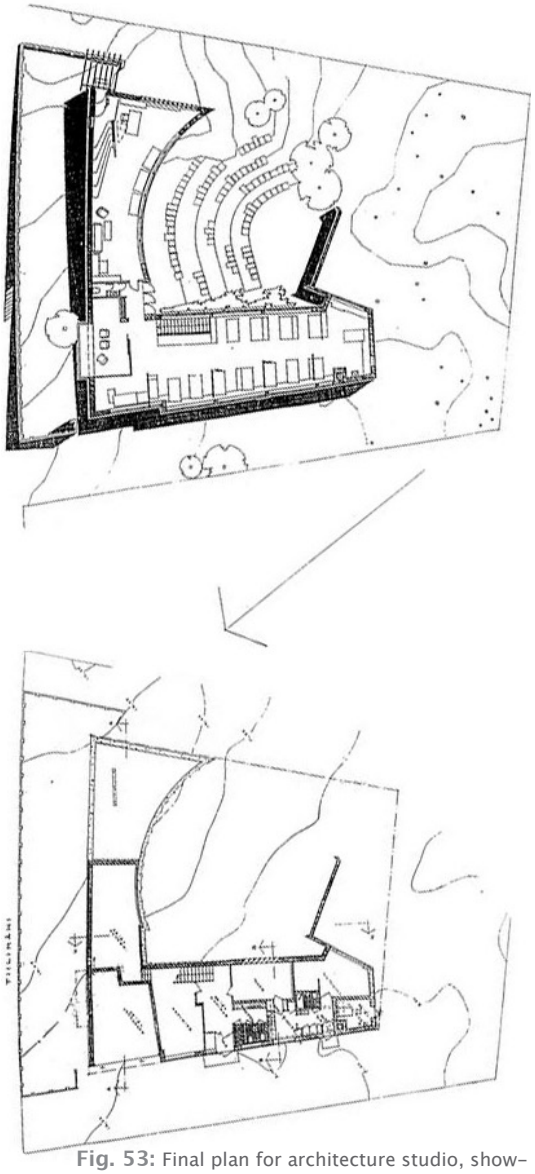


Fig. 53: Final plan for architecture studio, showing terraced patio and contours. (Aalto 1955).

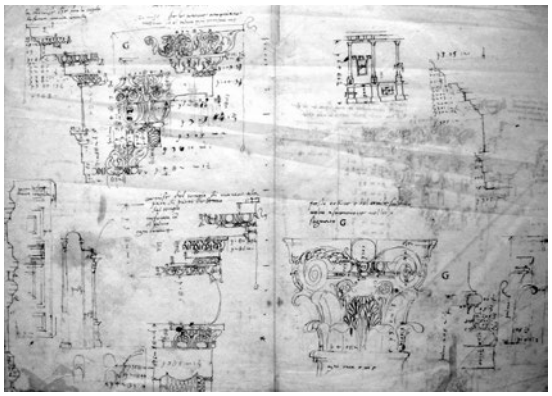


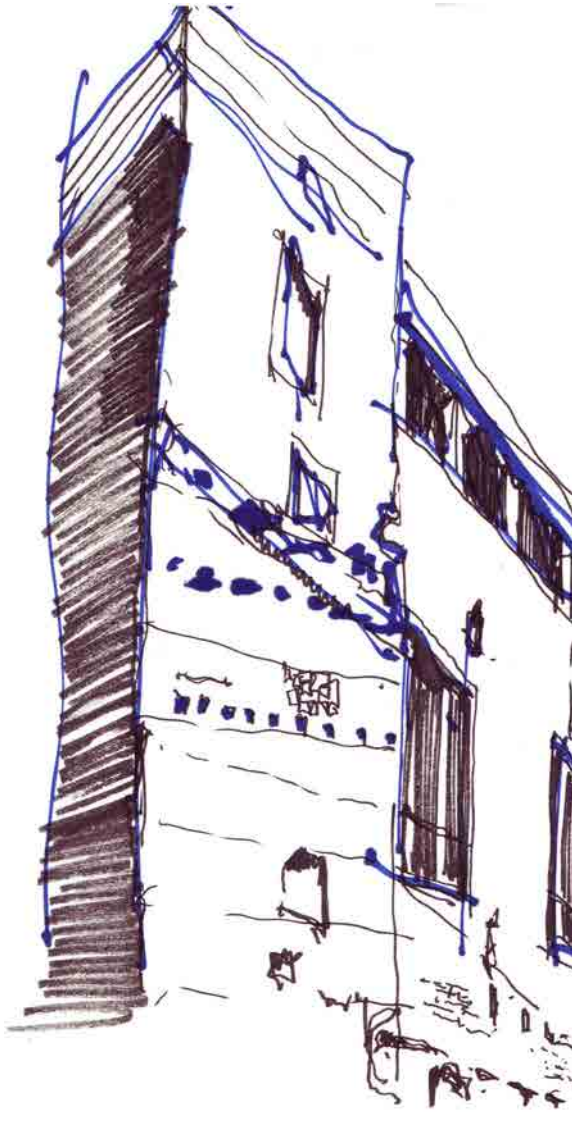
Fig. 54: Drawings of antique remains in Rome. (Palladio).

However, whilst the entire design process may be split into three parts, the three stages of prefiguration, configuration and refiguration can also occur across a far shorter time-scale, even within the space of a single sketch. For example, Garcia Navas (1997) explains the process behind Klee's drawing of the two soothsayers talking (Fig. 50), in terms of three broadly equivalent stages, starting off with almost random, reflexive, twitching lines, which gradually suggest certain forms. These are subsequently organised into a structured set of more definite strokes giving form to the entire composition. The final stage of carefully drawing the eyes and other details corresponds to the stage of refiguration, where Klee is representing what he already knows about, merely illustrating preformed ideas and executing well-practiced forms. According to Garcia Navas, these stages are distinguishable by the quality of the different kinds of lines, which in turn suggest the varying degrees of deliberate intention with which they were drawn.

The specific characteristics of place may be introduced into idea development sketches at different stages either before after or during the process of idea development. Place may be analysed before design starts, or checked after design proposals have been made in order to verify them, or place analysis and design may happen simultaneously on site. Before starting on a design, travel sketches drawn in-situ (Fig. 54), may also uncover aspects of place which would have otherwise gone unnoticed. Le Corbusier made great use of his travel sketches repeatedly throughout his career, at first publishing them to illustrate his theories on architecture (Corbusier, 1923), and then later on reinterpreting selected ideas from these sketches in his projects. Connections are often drawn between the Acropolis sketches from his Voyage to the Orient and the designs for La Tourette and the Unité (Sequeira, 2015) (Fig. 26). Alternatively sketching off site can also be a means of researching and learning about specific aspects of a place. Without using personal subjective experience, information gathered previously by others can be redrawn so as to understand it and incorporate it into a design. Aalto often drew and redrew the contour lines of topography on his plans to understand how best to site his buildings (Fig. 52, Fig. 53). This of course can have a positive affect on the transformation of place but only in the limited dimensions of the information which is redrawn. It does not provide a holistic view of place or help to evaluate which aspects of place are more significant than others. On the other hand, site sketching may sometimes happen after a design has already been started in order to verify the relationship of the

proposal to the place it is intended for. Some of Le Corbusier's sketch views of his city proposals such as Rio show ideas which have already been composed off-site and which are redrawn into a site sketch in order to see how they fit. Or place analysis and design may happen simultaneously on site. Throughout his career Siza has made great use of drawing on site as a way to start designing immediately under the direct influence of the complete embodied human experience of place (El Croquis, 2007).

One of the major differences between these three methods is the degree of separation in time between the in-situ travel sketch, and the design sketch. In the first, sketching to gather partial information and to incorporate it into design both happen at the same moment, but with no direct contact with the place in question. In the second, drawing is used to gather and record information about place through direct experience, but design is kept entirely for a later moment. The distance between travel sketch and design sketch may vary but the separation remains clear. In the third case, design is brought forward to the exact same moment as the travel sketch. This means both embodied investigation and design responses are conducted under the direct influence of place, allowing ideas to be cross checked against a holistic experience of place instantaneously. When designing place, all three of these methods may be combined to different degrees. It may in fact be most effective to make use of all three rather than relying excessively on any one. If any are totally ignored however, the resulting building is far less likely to fit well into place.



Fixing information at a point in time

One of the most fundamental reasons for drawing or writing, or making any kind of inscription has always been to fix a piece of information in order to preserve it intact as time passes. A simple jotting made as a memory aid is a basic form of far more complex surveys, but the purpose is essentially the same. Bruno Latour writes about inscriptions, describing their two main purposes. First, inscriptions serve to fix information over time, and secondly to preserve it in a flat and portable format. He gives the example of map makers sent to the far side of the globe to record geographical information which could be brought home and interpreted in detail from the distance (Latour, 1986). The importance of the inscription is as a permanent, and mobile, record of information, but the process this results from (that of

Fig. 55: Two views of the Pati Llimona, Barcelona. Roman walls and Gothic palace converted into a Civic centre by I. da Sola Morales (SH).

observation, interpretation and reflection in situ) is a necessary but noncritical matter. Sketching has the same characteristics serving to fix a particular idea in a fixed state. Either the sketcher may physically move on, as in the case of the travel sketch, or else the sketcher's thoughts will evolve onto new ideas as the design process continues, and the sketch serves to record the state of an idea at a particular moment in time. An interesting example of this are the drawings which Palladio made on his first visits to Rome, when he went in search of antique ruins, uncovering, surveying and sketching out the remains of the temples that he could find (Burns, 1982). The purpose of these drawings was clearly to record information on site, freezing time in its current state, so that this could be transformed into a new design after an extended pause (Fig. 54). Elements of these drawings can be seen reinterpreted very closely in his later projects (Burns, 1982).[30]

Inscriptions, and more specifically in this case, sketches made on location, contain information which is fixed in its present state at a particular moment in time, situating the object drawn within a specific time context. Essentially, a travel sketch is one which captures some essence of a place in the present, and inscribes these characteristics of place and the moment in time, fixing them for posterity. However, objects in their present state are unique on account of the particular path they have evolved along. If a sketch intends to show the unique particularities of an object, it ends up presenting a current image of an old object. The sketch cannot avoid investigating and explaining about the object's past as well. This is particularly important when describing place, as a sketch can capture not just a current instant in isolation, but the leading edge of an ongoing process of change (Fig. 55).

One inherent characteristic of "nontrivial" architectural sketches is an awareness of the architectural concerns that went into designing the subject matter (Frascari, 2011). When drawing a building therefore one might think of why and how it has reached its present state today, traces of the past suggest this. For example when drawing ruins, a naïve sketcher draws compositions of rocks, a sophisticated (nontrivial) sketcher draws fragments of a building, without necessarily redrawing the missing parts, there is awareness of what is not there. The sketcher constructs an idea of how the architecture has been made. The formal characteristics of the sketch belie the underlying principles behind the

30 "His designs reflect schemes and motifs which he had already defined and preselected in the course of his study of Vitruvius and the antique." Burns, 1982. p75

building. The intention of the nontrivial sketch is not to describe the current external surface of the object so much as to discover and construct what the reasons behind it have been. The sketch aims to decipher why the building is as it is rather than describe what the stones are. Time within the subject matter is crucial to the sophisticated architectural gaze and the sophisticated architectural sketch.

Sketches may describe a finite moment in time, or they may show a point along a sequence of steps. The information contained within the image may be fixed, but its meaning is interpreted differently by different viewers and in different contexts. Given the significance that this has on their role within the design process, the ways in which different contexts change meanings should be considered more carefully.

The interpretation of a sketch depends on the viewer's point of view. As discussed above, the understanding of the sketch is determined by the association which the viewer forms between the sketch and their own network of personal references – the result of past experience, precedents, new associations and dreams (the imagination) (Merleau Ponty, 1968). These references are different for every individual, however, it is possible that different people may share certain aspects in common, so that different viewers may reach a similar understanding of a sketch. For each individual however, this network of personal references varies over time, expanding, retracting or altering the relative significance given to different aspects. Consequently, even the same person who sees a sketch once and then again after a significant pause will interpret the same lines in a different way. On a collective level, over time, the emphasis given to certain aspects of a sketch will also change, and the image will come to mean something quite different to what it had meant originally. This may be seen in the sketches of Villard de Honnecourt which show an experienced mason's contemporary interpretation of what he considered most important about Gothic architecture (Fig. 56).[31] An equivalent change in the way of seeing over time may be seen in comparing drawings made of the Acropolis (Miralles, 2014).

The interpretation of any kind of representation is bound to be contextual in ways equivalent to those just described, however these effects are amplified significantly when the author of a sketch is also the one who reconsiders and interprets it later on.

Fig. 56: View of a church tower (Villard de Honnecourt).

31 Villard de Honnecourt, Original Portfolio, 1230. See Honnecourt, 2012.

John Berger (2005) describes how a drawing he has made and which he regularly looks at gradually changes its meaning for him over time. But more than simply change, the meaning actually deepens with time – the more he looks at the sketch, the more he seems to see in it. Gradually the interpretation of the sketch affects the original memory of the view drawn, and the two combine into a new hybrid type of memory which expands in new ways rather than fades away. Continued reflection on a particular sketch can therefore extend and augment the memory of a particular experience. The sketch, how it is drawn, and what it includes or excludes, has the power to direct the evolution of these memories along certain lines and not others. The sketch sets up its own line of future reasoning, which expands in an unpredictable but partially structured way. This is of particular importance when it comes to using sketches in the design process, and initial site sketches in particular. How sketches are reinterpreted and transformed into the subsequent design step will determine the evolution and outcome of an entire project. If the project starts out from a significant in-situ sketch, then this sketch stands the chance of fundamentally influencing the entire trajectory of the project. If this site-sketch is capable of conveying a significant reading of place, then this approach is likely to become integrated into the project, resulting in a design which relates fundamentally to the place where it stands. From the point of view of using place sketches in design, it is highly likely that by the end of the design process an initial site sketch will come to mean something more than it originally meant to the architect who drew it. If the meaning interpreted out of a sketch changes, so does its potential to affect design decisions. This potential may in fact grow as the understanding of the sketch matures, becoming more significant as the design process evolves. This appears to be the case with Siza's sketches of Formentor as explained below (Souto De Moura 2012).

This apparent change in meaning is due to reasons totally external to the object in question, but these influence the impression the drawing makes and hence its effect on how it will be used in the design process. Take for example, an architect designing a project who repeatedly considers an initial site sketch. The sketch may have been sketched hastily with little clear insight at the time, but with perseverance gradually reveals deeper meaning as the design progresses. As his opinion of the drawing gradually evolves, in other words, the more the architect reads into it, the more the sketcher's initial assumptions disappear and are replaced by more objective judgements which can help to

direct the course of the design to fit the building into the context of place. Time and repetition are needed to gradually understand what ideas are contained in a sketch.

Our understanding of a sketch depends on the web of references we compare it to. Over time these references change, and so in relative terms does what we understand from a sketch. Different circumstances of the viewer and context unlock or unveil what is already there. Equally the more time one considers a sketch, the more the sketch itself affects these references, so that one's recollection of a memory is formed more by the way the sketch represents it than the memory of the original experience. The capacity of a sketch to direct future lines of thought may be extremely positive when using site sketches to connect a design project to a specific place.

Time, drawing and the process of architecture

Apart from allowing a better understanding of time through comparison and evaluation, the design process is essentially about working out how to transform present realty into a better future. Its entire purpose relates to transformation between one state of time and another. Sketching is particularly useful in this sense because of the ease with which it can combine past present and future: Drawing present reality reveals the historical precedence, whilst the fusion with the imaginative perception and interpretation adds to this potential future states, suggesting ways in which the present situation could be transformed in the future (Merleau Ponty, 1968). This in fact means that sketch can combine the real and the imagined: In situ sketching can observe and explain existing reality as already described gradually revealing the underlying structures of place. Sketching in design is also used as a mechanism for developing ideas into the future, of visualising and transforming them – proposing modifications to existing reality which can be tested out to evaluate an imaginary hypothetical future.

The concept of place itself depends to a great extent on time – sense of place is affected by a place's history and may be manifested in many ways, through built form, collective memory or others. Architectural projects aim to transform place in the future. The ways in which time and sketch interrelate affects not only the sketch itself, but also the way the sketch is used, and the way in which we understand the passage of time and orga-

nise time-based processes. In fact drawing has been of pivotal importance to the architectural profession since the Renaissance when the development of drawing techniques and conventions allowed architects to practice away from the building site (Robbins & Cullinan, 1994). The fact that a design could be drawn out definitively, and communicated efficiently to others without the need for constant supervision and direction on site meant that architects could now develop a design through drawing first before any construction actually began on-site. Drawing allowed the spatial and temporal separation of design from material execution. The modern architectural profession has developed from these roots, in large part due to the control drawing has allowed over the time frames of design and construction. Although architectural drawings exist from the time of Ancient Egypt onwards (Smith 2006), drawing and its role within the architectural profession has changed dramatically over time. Far from being a fully defined tool, its use will continue to evolve, incorporating new techniques and specialising older ones. Drawing has significantly affected the essence of the profession in the past, and could well do so again in the future.

The repeated cycle of observation, sketching and critical appraisal comparing the sketch directly to observed reality throughout the process makes it a particularly sensitive way to analyse place. Through the gradual process of refinement, this provides a reliable basis for designing buildings which fit in to place. The layered exposure of the sketch is of great use to architects concerned with understanding place. The prolonged period of observation, coupled with the active making of the sketch, mean that the time spent in reflecting and reacting to the subject matter is greatly superior than with other methods of observation. Subjects are observed more closely, and considered more deeply during the course of the sketch. This undoubtedly helps the architect to reach a greater understanding of place far more deeply than through taking a photograph or simply observing passively.

Sketching helps to envisage the design solutions of a future time, and hence how to transform place. It also helps to structure the indefinite process of design, to reason through solutions sequentially and to consecutively build up their complexity over time. Sketching provides a single method both to explore ideas to reach decisions and also to illustrate them in order to verify them. It is uniquely useful to the design process for its ability to serve both purposes and to switch easily and rapidly between discovering and illustrating ideas. Between proposing ideas and evaluating

them. The more fluid this overlap is, the more dynamic the design process and the faster and better the solutions which appear. This flexibility is exceptionally useful to the designer as it gives time to experiment whilst drawing, allowing thoughts and ideas to emerge, gradually evolving rather than having to be predetermined. As a result ideas can develop far further through conscientious experimental drawing than through cerebral reflection alone.

Sketches are contextual and so our understanding of them evolves along with the context we are surrounded by. This is so with the collective opinion regarding sketches and at an individual level. The original "meaning" of a sketch is unknowable, as this meaning will have evolved over time, making it difficult to reach an objective conclusion about the author's real intentions through historical analysis. However, changes in interpretation over time can be turned to positive effect allowing new meanings to enrich and mature previous understanding. Consequently the careful and repeated reviewing of place sketches may prove a tremendously useful exercise during all stages of the design process. Le Corbusier's repeated reuse of his early travel sketches in his later work demonstrates that over time this meaning can grow out of a sketch rather than recede as a memory (Corbusier, 1923, 1966).

PART I

SUMMARY

Sketching in-situ is especially effective for analysing place partly on account of the reversible link that forms between sketchers and their environment which helps to mould and improve their point of view as well as stating it clearly for others to understand. Embodiment encourages the analysis of place to develop from a human point of view with a profoundly realistic basis. Through the process of gradual learning, sketching develops place analysis into the start of design, allowing design ideas to develop fluidly out of a deep and realistic understanding of place. Sketching therefore takes advantage of the insights and associations formed by subjective reflection in the mind of the sketcher to develop a complex and personal understanding of place through actively combining embodied perception with the imagination of the sketcher.

Subjectivity can be of great assistance when analysing place, understanding it deeply, and proposing how to transform it. Subjective ideas are an essential part of any experience of place. It is important to acknowledge this and benefit from the controlled development of subjective ideas which sketching allows. It pro-

vides a single medium through which to combine objective reality with subjective perception and thought, incorporating those factors observed directly from objective reality directly with external, subjective ideas and associations into a project, a method capable of combining them on the same level as a basis for new design ideas. The particular open minded and highly receptive state of mind that goes with in situ sketching tends to foster apperception sparking new ideas through developing subjective associations and proposing new ways of seeing the surrounding environment. Sketching can then work as a method to control these subjective ideas, stating them in an objective format and allowing these to be shared with others, discussed and critically evaluated. This is therefore a method for objectifying and reasoning out subjective ideas and intuitions, which may be of great benefit to a project and the transformation of place through architecture. Sketching is effective for the way in which it keeps subjectivity under control, using it to advantage and not eliminating it.

Regarding time, sketching is a method which helps to discover and understand the significant aspects of the past in the subject matter which makes it unique. Sketching provides the opportunity to discover and emphasise these unique characteristics bringing out the individuality of the subject through its history. More than this, the sketch allows the subject to be added to and exaggerated to the point where the sketcher's imagination and dreams of a potential future can become fused into the drawing. The recurrent liberties taken by Le Corbusier in his sketches for the sake of emphasising the point he wished to make show that a sketch is not confined to capture the present moment alone, but is capable of fusing together aspects of the past and imagined future to whatever degree may be most useful in order to find or explain a particular architectural concept. This freedom to construct time in whatever way the sketcher considers best can make the most of the sketcher's sensitivity and lead to new insight in design. Appreciating the change of our perceptions over time and turning this to the designer's advantage, deepening one's understanding through careful and prolonged observation and drawn reaction, as a method to encourage the flexible interplay between creating ideas and illustrating them, as a medium capable of discovering and highlighting aspects from the past present and potential future, are all of great value to architects designing place.

Sketching relates to place, subjectivity, and time in many ways – although not all are in the exclusive domain of sketching, the sketch provides a uniquely powerful and convenient way to con-

trol and use each to benefit design. Each of these arguments will appear during the course of the following examples of architects' drawings, buildings and places.

PART II

ANALYSIS & DESIGN:

TRAVEL DRAWING AND DESIGN SKETCH AS A SINGLE PROCESS

In 1959 Alvar Aalto was invited to Iran to design a contemporary art museum in Shiraz. His visit lasted a weekend and resulted in various initial sketches of a building which was drawn out later on returning to Finland (Reed, 1998). The site sketches are particularly interesting showing a terraced hill ringed by taller mountains and with a road passing alongside (Fig. 57). Some sketches show a set of striking terrace walls, others show what appears to be an extension of these terraces crowning the hill top. Some sketches show the landscape in its existing state and others show the first impression of the final building in position. In elevation, the proposed building takes its form from the pre-existing structure of the landscape. The first sketch is in effect a travel sketch made during his visit to the site, the rest are design sketches investigating how the building might relate to its site, and what effect the building might have on the place. Yet the graphic quality of the different types of sketches is extremely

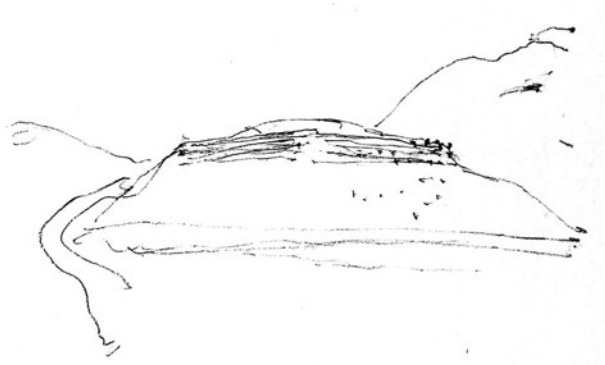


Fig. 57: Site Sketch for museum in Shiraz, Iran. Aalto 1969.

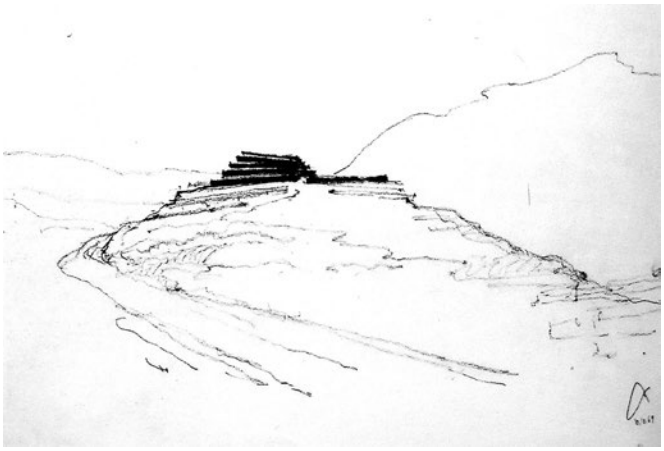
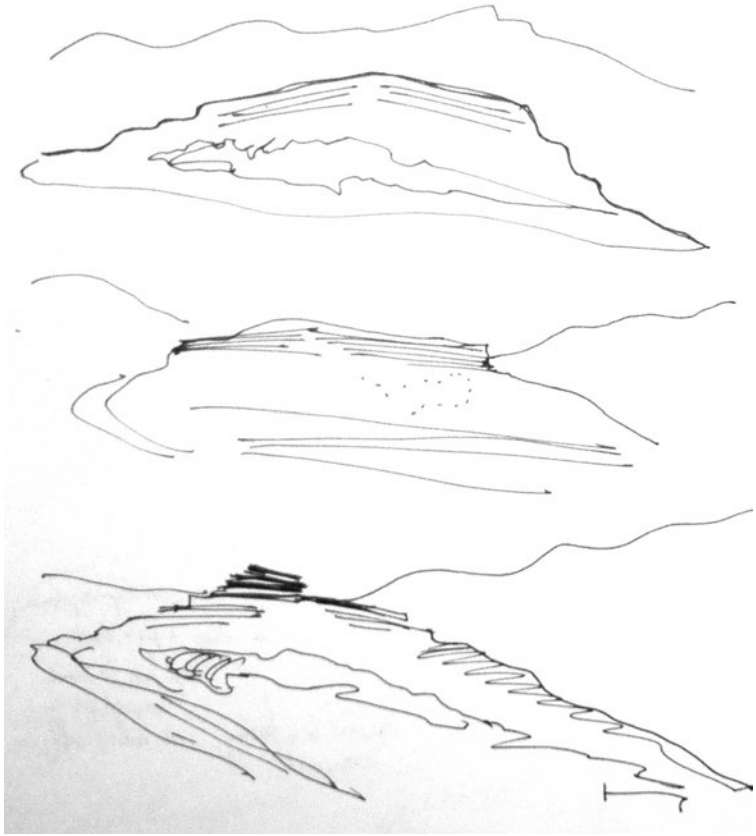


Fig. 58: Sketch with proposal for museum in Shiraz, Iran. Aalto 1969.



similar. From simply looking at the way they are drawn it is hard to tell if they are all design sketches or all travel sketches. The scheme progressed little further than this design stage, but it illustrates the difficulty of distinguishing unequivocally between what constitutes a travel sketch, and what a design sketch.

The previous chapter brought up a variety of ways in which both sketches themselves and the process of making them can help the design process to establish connection between a potential design and a particular place. The ways in which sketching involves subjectivity, time, and place can all be used to improve both the analysis of place and its design. Aalto's sketches of the project in Iran however raise the question of what the differences there actually are between analytical travel sketches and propositional design sketches, where the distinction between them lies, and most importantly, whether it is actually helpful for design to consider them as separate at all.

One way to justify the importance of travel sketching for the architect is to consider that sketching in-situ teaches the sketcher new ways of seeing. Whilst these may not be a matter of transcribing details for later re-use as in the case of Palladio's journeys to Rome, the same general idea applies (Burns, 1982) (Fig. 60). The sketcher captures something which may be quite undefinable in words and internalises it. At a later moment this knowledge may provide, if not a set of details, at least a point of view which will assist in the design of a new and apparently independent architectural project. The two activities of site sketch and design are held entirely separate, the only vague connection being an underlying way of seeing. Usually this is as close as travel and design sketches come to one another. However, if design intends to integrate itself in the specific qualities of a particular place, and a travel sketch is such a powerful means of uncovering the nature of place, made when the architect's conscious awareness of place is at it strongest and most receptive, it would seem clear that the closer the two are integrated, the more one stands to gain from the other. This is discussed in the following section through answering the following questions: are the analysis of place and the design of place essentially separate activities, or are they in fact part of one single process? If there is a distinction, then at what point does a sketch cease to be a work of analysis and become a work of design? In contrast, by treating design sketch and in-situ sketch as a continuation of the same train of thought, could this open up new opportunities for design to benefit from the experience of the travel sketch, steeped in the qualities of place which only first hand experience and a sense of adventure can provide?

Fig. 59: Graphic analysis sketches, of several of Aalto's site sketches, investigating different qualities of line. See Hewitt's article (1989) on the importance of outlines in Aalto's drawings and projects (SH).

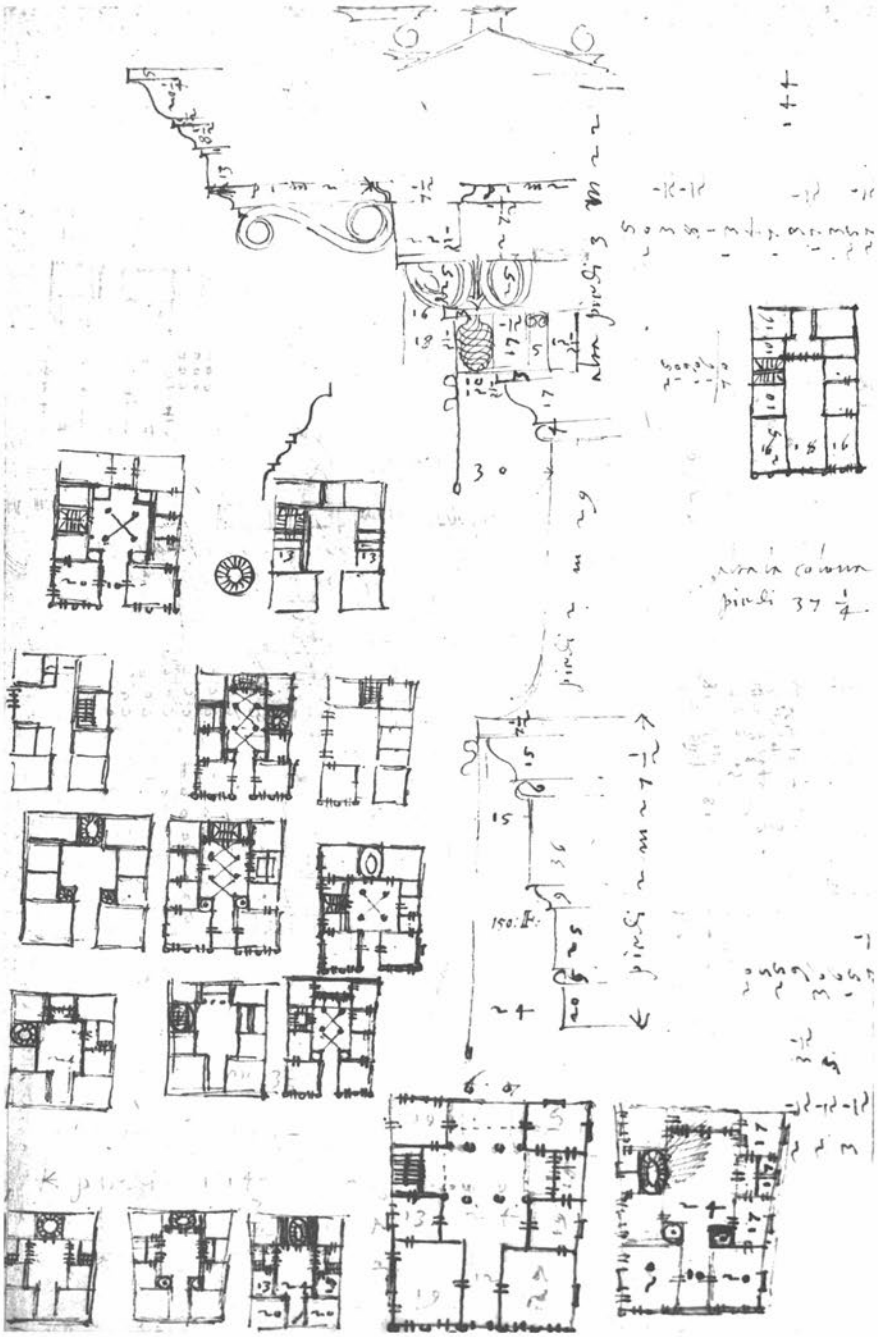


Fig. 60: LEFT: Twenty alternative plans for a Palace (palazzo Volpe, Vicenza?) and a sketch of the entablature of the temple of Venus Genetrix. (RIBA XI/22 verso, right part) (Palladio).

Fig. 61: BELOW: Travel sketch of temples in Rome (Antonio da Sangallo the elder).

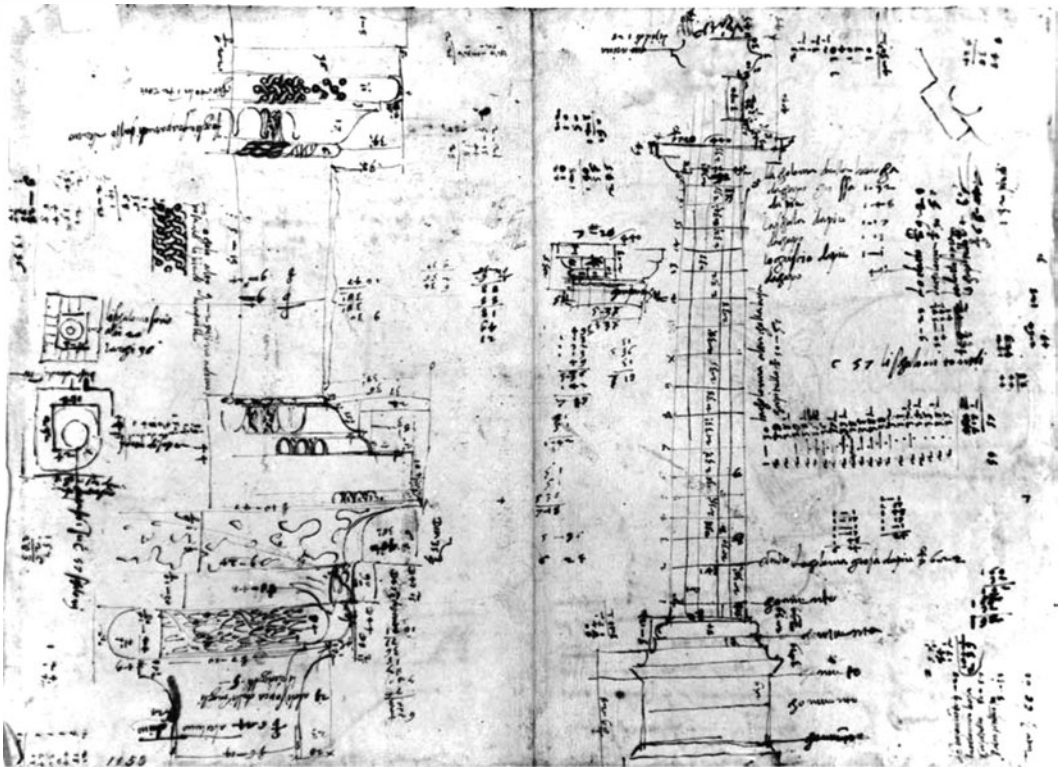


Fig. 62: ABOVE: Travel sketch of Piazza San Marco, Venice (Alvaro Siza).

In the prologue to his book of travel sketches, Alvaro Siza writes that "In the space of an authentic journey, the eyes, and by means of them, the mind gains unexpected capacities. We perceive in a non-mediated way. That which we learned reappears dissolved amongst the lines which we later draw." (Siza, 1988. p.15) (Fig. 62). Drawing, looking and thinking whilst travelling have a positive influence on what one draws and designs later, but how close should this connection be? By making the connection too direct, there is a risk of literally copying architecture from one context directly into another (Graves, 1977) (Fig. 63), but by leaving the connection so distant that travel sketches are as good as forgotten seems to miss an opportunity. The potential for one single activity such as sketching in-situ to connect the design imagination of the architect with the underlying structures of place is extremely significant for any site-specific design project. Before discussing how design sketching can best incorporate aspects of travel sketches, it is worth first considering the architect's travel sketch in more detail in order to see how it may be made most useful for translating into subsequent design work.

…

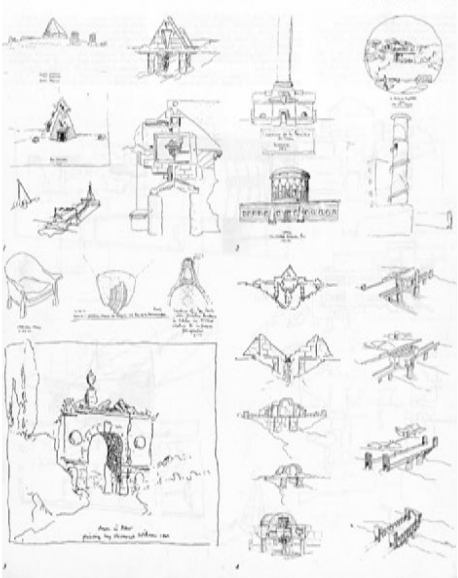


Fig. 63: ABOVE: Referential sketches (Graves, 1977).

In the 18th century, when the Grand Tour first became popular, the travel sketch became a standard means to prove the traveller's journey and to record experiences and places for future reference and for explaining on their return. The 18th and 19th centuries are full of such visits to the Classical world leaving behind a trail of watercolours and the like from the major sites. This was a common way to capture views and vwas used by a large proportion of the privileged who had the opportunity to travel. Such images had significant influence on the conception of the Classical world and appealed greatly to the Romantic movement (Fig. 64).

However during the later 19th century, the intentions behind the sketches of architects on the Grand Tour can be seen to change. Beyond technical records of measurement, proportion and detail, there was increasing interest in capturing a spirit or character in sketches (Fig. 65)[32]. Atmosphere became an essential part of the authenticity of a place and its architecture as illustrated by Ruskin's watercolours for example (Fig. 66). The idea emerged that the Grand Tour was not just a matter of visiting and recording minutiae from the established route of monuments, but was more importantly about seeing the Classical world in its context – temples on cliffs, theatres dug into the bowl of the hillside.

32 EGA conference, 2014. XVth International Congress of Expresión Gráfica Arquitectónica: Travel drawing Las Palmas de Gran Canaria 2014

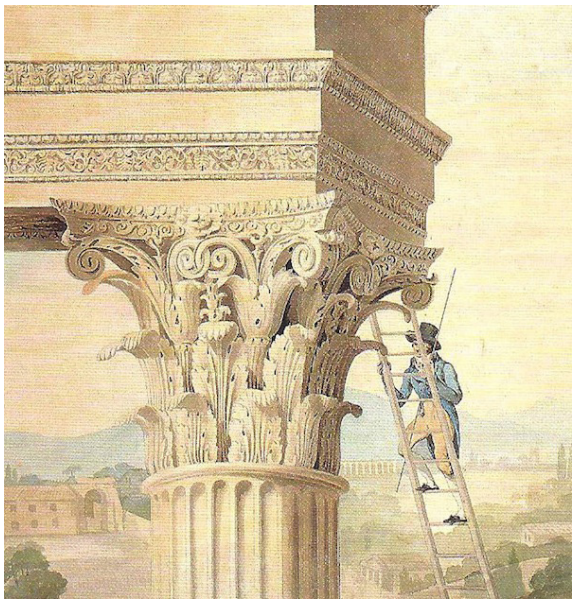
Beyond the isolated architectural artefact, place became important. Drawings shifted their emphasis from quantifying reality, to conveying a sense of place. Architecture in its authentic atmospheric context.

Fig. 64: Watercolour of the Acropolis, Athens (Edward Lear).

This gradually evolved further, at the beginning of the 20th century the travel sketch ceased attempting to record reality observed just the way it was (or the way it was supposed to be) as photography could achieve far more complete results (Fig. 67). Instead, the architectural travel sketch evolved into an exploration and investigation of the principle ideas behind the design of the architecture at hand. The ideas underlying the architecture came to take precedence over the picturesque atmosphere of the scene. Today, this purpose continues to be the main aim of architects trying to learn from an existing precedent as Michael Graves (1977) explains. The quality of the sketch lies in the ideas discovered and conveyed rather than in the authentic perfection of the picture.

Travel sketching becomes one of the principle means of understanding, besides recording, architecture, place and the design logic which ties them together. The theses of Mansilla (2002) and Ricardo Daza (2015) both investigate the journeys of architects and the process of discovery through travel. A more satisfying definition of the travel sketch might be a sketch made of a foreign place whose purpose is to interpret the essential architectural ideas of its subject. The sketch and the act of sketching provide a thoughtful investigative process which is sensitive to the real specific qualities of place and is capable of extracting an underlying logic of a building's design. As Wigley (2011) says, this essence may be achieved in a few lines then taken home to be grafted into a future project.

Fig. 65: Surveying a Corinthian capital (Henry Parke).



But in certain cases travel sketches go further than this. Consider Kahn's views of the SW and NW facades of the Acropolis, or that from the temple of Jupiter (Hochstim, 1991) (Fig. 68). The sketch is not just the means to research the fundamental ideas of a building and place, it can also be a way in which the sensitive architect can consciously design his own interpretation of these ideas. The resulting sketch may be influenced by the reality in front and be based upon it, but this forms only a starting point from which the architect may create his own way of imagining it, effectively designing the image as if it were a project in his mind's eye. The architect's travel sketch may become a means of designing an individual conception of architecture and place,

Fig. 66: Ca D'Oro, Venice (Ruskin 1845).

Fig. 67: Acropolis from the south 1910 (Boissonnas).

Fig. 68: Acropolis and temple of Jupiter (Kahn, 1951).

using observation to stimulate the ideas and the imagination of the architect and generate the design process on the page. Travel sketching becomes analysis rather than just pure description. In this case, place becomes increasingly important but its use changes. The sketch combines the ideas and wishes (the imagination) of the architect with the stimulus observed from the surrounding environment. Internal thoughts and external perception of place are fused together into a single image, designed on the page. However, by excessively extending this approach, the imagination can take precedence over observation and the sketch may loose all connection with the actual experience of place. Therefore it is important to avoid either excessive naturalism or excessive abstraction in a travel sketch, a balance which the architect must decide upon whilst immersed in the conditions of place.

Whatever stage of a project sketching occurs at, the process of sketching and thinking are equivalent, whether at the beginning of a design, during the construction process or even well before the actual project with specific site and brief was ever considered (Lapuerta, 1997). The first sketches made of a design may happen once a project has been commissioned, but equally they may have appeared long before and been left waiting for the opportunity to be developed. Whereas Michelangelo's sketches show him inventing his designs through the act of sketching, Palladio's design sketches are very different (Burns, 1982). The sheets of sketches for the Palazzo Volpe show a set of variations of the same principle elements arranged in alternative ways (Fig. 60). Design sketches such as these show the architect shuffling through previous ideas looking for potential innovations by different combinations of predefined elements. It appears that he uses his experience from his own projects and from those precedents he had previously drawn, to find the best arrangement of parts for a particular site.

"(Palladio's) approach to design is radically different from that of Michelangelo. He designed essentially as an Albertian architect, adapting and combining schemes, for the most part derived from the antique already clearly defined in his mind, rather than actually building up the design on paper changing it progressively as a sculptor does with a clay model." (Burns, 1982, p.79)

His design sketches blend reminiscences of antique remains with his new proposals. Both travel sketch and project sketches are fused together. As Palladio wrote, his ideas had come out

of “those things which I have learned through my many studies and through my great labours in the long journeys which I have made”. (Palladio, 2002, Book II. p.4) “The design for the Villa Rotunda was made essentially when Palladio arrived at reconstructions of the temple at Pallestrina which include at the top of the hill a domed structure with porticoes on all four sides, not when he made his first drawings for the villa itself.” (Burns, 1982, p.80)

The travel sketch requires certain necessary conditions if it is to function as a design project. The travel sketch is fundamentally contextual, it requires embodied holistic experience and produces contextual images. They are immersed in the cultural environment of the sketcher and the place, and are determined in large part by the sketcher’s reaction to chance. But they are also governed by prior knowledge, using it either to advantage, or reacting against it. They require significant effort to think, consciously trying to reach a solution, but at the same time remaining open minded enough to be receptive to chance discovery. Time and repetition are nearly always necessary, the design process requires ideas to appear, evolve and mature, ways of drawing and ways of understanding need time and several iterations to reach improved and individual conclusions. But together with design, the travel sketch, must always remain in touch with reality through observation.

The aim of this section is to establish the real equivalence between in-situ or travel sketching and design sketching. The only clear difference being the directness of the design intention, which is still to some extent implicit in all forms of sketching. This is approached through investigating what travel sketching requires in order to become productive for design, and then comparing how those ideas discovered in travel sketches may be transformed into design projects. Two examples are considered in which travel and design sketches are first separated by a substantial period of time and second, compressed to the point of forming one continuous process.

In order to consider how architects have used travel sketches to analyse architecture and place the first chapter investigates a set of Le Corbusier’s travel sketches from his first visit to the Acropolis in Athens in 1911 (Corbusier, 2002). This is approached through analysing a set of architectural travel sketches to see how they investigate the relationship of architecture to place. The chronological sequence of the selected sketches allows this

new analysis to reveal the different stages through which ideas have passed during the process of this in-situ investigation. The second chapter examines how these travel sketches influenced later design. Having seen what ideas are brought to light and how they are unravelled, these are discussed in relation to the architect's later built projects. The influence of travel sketches on design work is made clear despite the separation of several decades. The third chapter takes another example of travel sketching and design sketching by Alvaro Siza, which shows how both processes happen simultaneously.

The in-situ sketch made on site bears much in common with the "travel" sketch, except that in this case the intention from the outset is to use the sketch to help the design process for a specific building, more often than not with a prescribed use, size and many other characteristics and limiting factors. Of the many ways architects have chosen to familiarise themselves with a site before starting to design a building on it, a site sketch made in-situ is one of the most traditional. Even if never consulted again, architects throughout the last century often made a sketch on an initial visit to a site, a practice which has nowadays all but disappeared from professional practice and also largely from architectural education. Nevertheless throughout the last century it appealed to many architects as the obvious and perhaps even natural way to make a first reading, or better put, a first interaction with a site.

This curious exercise which nowadays seems so quaint and old fashioned, had purpose, and one which has not been replaced by the introduction of alternative media, either photography or new technologies. According to Mark Wigley (2011), the purpose of the travel sketch (and likewise the site sketch) was to capture an essence of place which is somehow hidden to immediate observation, capture it in a few brief and cryptic marks and reserve it for use at the beginning of the design process. It should somehow provide a clue from which to unravel a design which may in turn be "grafted" onto the place in question. Most often, if this method is followed, then the site sketch is only used at the beginning of the process, as an idea for starting, but as likely as not, then moving away from it with the other pressures of the design process.

In the majority of cases then, the site sketch serves to acclimatise the architect to a site, and perhaps to record some abstract impression of the place which might then have a vague influence

on the starting ideas of the project. Nevertheless all the benefits which the travel sketch has for architects apply equally to the site sketch, the only difference being the greater proximity between sketch in-situ and real design project where one leads directly on to the other. The reasons for the effectiveness of the in-situ sketch as a means to understand a place and therefore react to it intelligently and sensitively with an appropriate design proposal, have however not changed with technological advance in recent years. Whilst other technologies have advanced and come to dominate so much of the usual design process for architects, those aspects discussed in the previous section concerning holistic embodied perception of place and the immediate thoughtful design proposal which the in-situ sketch offers have not been superseded by other means. The major questions behind designing a building for a particular site are the same, as is the creative process of reasoning out how to combine the local characteristics of a site with new and foreign ideas for the project. These need to be combined as closely as ever if the architect is to achieve a building which reveals a sense of place, questions which are becoming increasingly important as Frampton points out (Frampton, 1981, 2011). Site sketching can now play a more significant role in this matter than ever before.

...

Graphic analysis: A method for understanding place in the travel sketches of architects

Whilst in-situ sketching is therefore an approach to one's surroundings rather than a method in itself, drawing can also be used to develop rigorous analytical investigation of other drawings and put forward coherent and reasoned graphic arguments. Bearing this in mind, in-situ sketches are less the result of a predefined method than an active and reactive process between context and the sketcher's mental vision.

Aims of graphic analysis

It is interesting to analyse architects' sketches for two main reasons: First, in order to understand what has been drawn – what mental conception has been under construction. This may only be built up from fragmentary glimpses offered by aspects of a sketch or sketches. Second, to understand why this mental image has developed the way it has, in other words to discover in the

sketch what were the reasons behind the many decisions made during the drawing. This requires architectural knowledge and can be investigated most clearly through comparing how particular aspects change and evolve across a series of variations.

How can one analyse an in-situ sketch in order to understand what idea it attempts to convey, and the reasons why a series of sketches develop? The technique usually adopted in the majority of the literature is direct visual interpretation using a written commentary to bring attention to certain aspects of the drawing. However these are often descriptive, and those which provide more analysis usually require lengthy written description to make the analysis clear. Given that the thought behind the sketch had been developed and formed through the construction of an image, in other words mainly visually, any attempt to uncover the underlying conception behind it which uses another medium requires translating the information into words before it can be communicated. This inevitably looses, or at least changes, part of the original meaning behind the drawing, but it also reduces the clarity of the thought. A picture speaks a thousand words.

Place is complex, and any sketch of it must inevitably select a reduced amount of information. This is a basic way in which we make sense of overly complex reality, through creating generalised types. Brigit Riley (2002) gives the example of drawing a tree which conveys the fundamental idea of a tree not from precisely copying one single case, but from combining the prior experience of many specific examples. Likewise, Gamiz Gordo (2003) states that due to its complexity, architecture also requires analysis which can separate out its principle themes breaking it down into understandable parts. He describes various types of graphic analysis which investigate different characteristics of a drawing: Diagrammatic analysis involves reorganising the sketch as a schematic but clarified image which retains only the minimum selected attributes of the original drawing; Decomposition analysis involves separating out the principle parts of the drawing and relating these to one another to understand the major relationships in the drawing's composition; Comparative analysis distinguishes differences and similarities between different but related drawings; Temporal analysis investigates how ideas in a drawing evolve across a series of sketches drawn over a period of time; Gamiz uses the term "creative analysis" to cover speculative investigation which anticipates, imagines or recreates aspects of original drawings. This final form of creative analysis is closely linked to the design process involving the

same sequence of reasoning and intuition developed through sketching. Gamiz Gordo writes that "every drawing is a graphic project" given that they both involve a process of trial and error and of proposing ideas and means of improvement.[33] According to Gombrich (1960), when we interpret something, we actively project our hypotheses onto what we see – therefore all analysis is a matter of projection and design. For architecture, analytical instruments should be the same as design instruments. Analysis and design are interwoven activities which benefit from being combined rather than separated.

Selecting themes for analysis

In Part II, sketching forms the basis of the method of graphic analysis. The analytical techniques employed refer to those described by Edmund Bacon in The Design of Cities (1976). Apart from the content of a drawing, the way in which something is drawn is fundamental to how it reflects the author's mental conception of the subject matter and how it can influence this opinion. Therefore it is essential to understand the graphic means of representation in order to evaluate where the focus of the ideas lies. Bacon explains the deconstruction of an image into its essential architectural parts relationships. These include the relationship to the ground to the sky, to man, depth and distance, recession planes, ascent/descent, convexity/concavity and points in space. In the same way, these or similar themes are taken as the basic framework for the analysis of the group of sketches.

The comparative method

Having broken down the original drawing into these basic regions, selecting which are of particular relevance to the issue in question, various comparative techniques are used to understand the reasoning behind the drawing in question.[34] Methods of analysis based on visual comparison of drawings have long been

Fig. 69: Architectural themes for graphic analysis of a drawing by Francesco Guardi, 18th century: Convexity & Concavity (top) Points in space (mid), Ascent and Descent (bottom) (Bacon 1976, pp24-27).

33 Gamiz Gordo, 2003. "Todo dibujo es un proyecto gráfico"

34 According to Jean Epstein, film maker and author in the magazine Esprit Nouveau, comparison is the instrument of knowledge; analogy is the instrument of demonstration. Quoted by Quetglas. J., 2015. Lecture on Vers Une Architecture at the International Conference "Le Corbusier 50 years later" ETSA Valencia, November 2015.

Fig. 70: Architectural themes for graphic analysis of a drawing by Francesco Guardi, 18th century: Meeting the sky (top) Recession planes (mid), Meeting the ground (bottom) (Bacon 1976, pp24-27).

employed in architectural theory[35] but various significant aspects of the approach are explained clearly by Darcy Thompson in a different context through his analysis of the relationship between growth and form in the natural world. The difference in subject matter - the morphology of flora and fauna as opposed to architecture - allows the method to be seen independently from the usual architectural context. This is relevant to the comparison of sketches in the following ways:

As Darcy Thompson (1917) explains, comparison reveals two particular characteristics: the direction of change, and the magnitude of change. If these two questions can be recorded, then it may be possible to trace where and why the changes occur. In the case of in-situ sketches this may suggest reasons why certain decisions are made at particular moments in reaction to particular stimuli and how this all affects the mental image of the sketcher in-situ. The magnitude of changes between sketches may show the relative significance given to one particular idea or another (Fig. 72). A comparison of two of Le Corbusier's sketches of the Acropolis illustrates such a change of approach whilst sketching. Sketch 111 shows the centrally located temple of Athene Nike standing out against the landscape backdrop. Sketch 113 however shows another view of the same temple where the distant space and the horizon are framed between the two balanced building volumes (Fig. 73, Fig. 74). As discussed in more depth below, this suggests that Le Corbusier's interest changed from focusing on individual objects to the spaces that they generate between them.

Although concept diagrams may be enlightening in their own right, when compared with other similar diagrams they can reveal how the ideas behind the sketch are changing. The sketch is both the result of this change but also the generator of it. Hence the comparison across sequences is needed to show the direction and magnitude of change in ideas and how the overall vision of the architecture develops. (FIG) Concept diagrams of an isolated sketch are only capable of describing an instantaneous static moment of a thought, of analysing what the decisions were but not why they were reached or how they were then evaluated and transformed. By conducting the same graphic analysis on

35 See for example Fletcher, 1901: A History of Architecture on the Comparative Method

equivalent sketches by different architects it is possible to break down and isolate the differences/similarities of approach to architecture with some precision.

How graphic analysis functions as a research method

Analysis which is limited to superficial, passive observation of a drawing and which is then expressed in words often tends to limit itself to superficial descriptions. If, on the other hand, sketching itself is used as the method of analysis, it takes advantage of all the benefits of the sketching process to better understand the drawing. These include an element of intuition in looking for insights (a process which is both subjective and imaginative) which is essential in order to find the best research question to ask.

Whilst analysis of other drawings through sketching also stands the same difficulties as sketching in-situ certain things can be done to improve its objectivity and record it for later repetition or verification. Graphic analysis also provides a visual record of the research capturing how the argument has been reasoned out from the original drawing. This may be critically examined and evaluated by others. It can therefore present a consistent and relatively disinterested criticism of the image being analysed.

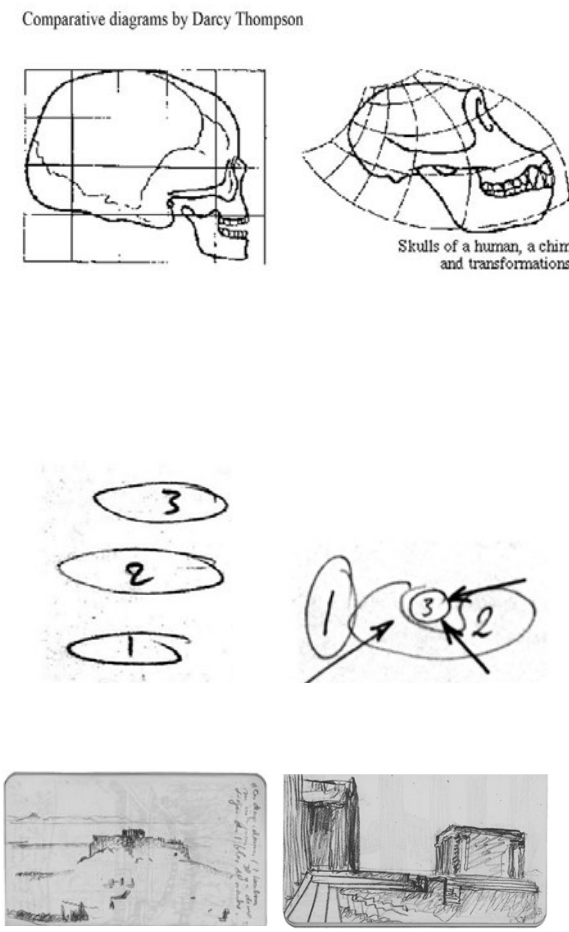


Fig. 71: Sketch diagrams of the approach sequence to the Parthenon, Athens. Based on the theory of Choisy, 1899. (Eisenstein, 2001).

Deconstructing into diagrams

First, original sketches are reduced to diagrammatic form showing those aspects which are judged to have been primary intentions behind the image. This is based on an initial evaluation of what aspect of the drawing the sketcher focused most attention on, and is worked out through first copying the original sketch in the same medium. Tonal emphasis, level of detail, precision and the amount of care taken on the structure of the drawing (such as composition, depth and proportion) provide clues to the focus of the drawer's attention whilst sketching. The diagrams used below reduce complex images down to individual concepts. Although highly simplified and reduced back to individual ideas, these conceptual diagrams allow one to clearly observe how sketches transform along with the ideas behind them. By breaking down a complex sketch into its constituent parts, the final analysis can be more consistent, clearer and take its conclusions further than superficial visual comparison would allow.

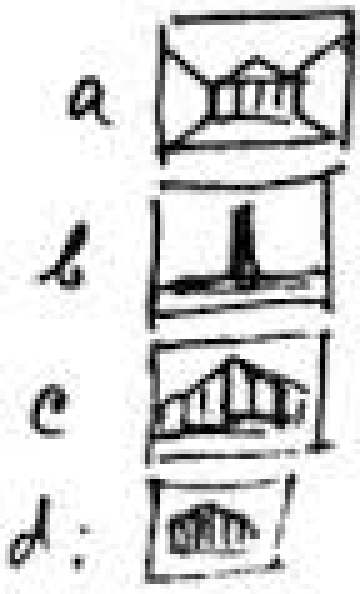


Fig. 72: Comparative diagrams of human, chimpanzee and baboon skulls (Darcy Thompson).

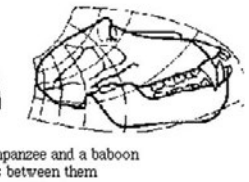


Fig. 73: Comparative diagrams analysing planes of depth in Le Corbusier's travel sketches below. Showing foreground 1, middle ground 2, and background 3. (SH).

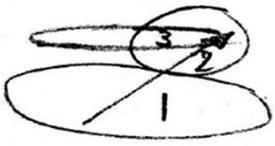
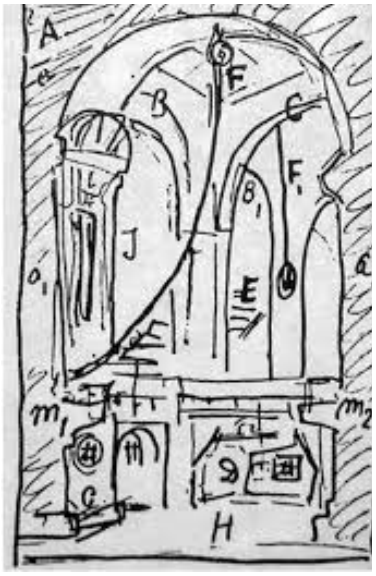


Fig. 74: Sketches of the Acropolis p98, p113, p125. (Corbusier, 2002)

Fig. 75: Analytical sketch diagram of a print by Piranesi. (Sergei Eisenstein).



Second, diagrams are shown in sketch form to a level of precision equivalent to that employed in the original drawing (Fig. 71, Fig. 75).[36] These drawings could of course be reproduced digitally by other far more exact means, but given the inevitable imprecision of the original in-situ sketches, this is considered unnecessary and may even prove misleading. Too great a precision may give excessive weight to inconsistencies which are actually irrelevant or largely the result of contextual circumstances. Sketches are by their nature imprecise, which for many reasons is one of its greatest advantages. This imprecision allows room for creative reinterpretation and the refinement and invention of new ideas. Nevertheless this can easily go far beyond the original intentions behind the sketch, reaching a point where the analysis is the pure invention of the researcher and not of the original author. Excessively magnified examination of details may imply intentional meaning where none was intended. The technique of reducing the sketches to diagrammatic form is executed carefully and consistently but to a level of accuracy judged to be appropriate to each individual case.

Summary

Comparative analysis therefore needs a form of representation equivalent to that being studied. It can show the direction and magnitude of change if drawings are in sequence. It shows the relative value of particular features and the forces they react or respond to. They can show the intermediate steps and help to reveal how ideas evolved. They can suggest where different forces have come into play such as the role of external influences.

The method of graphic analysis is based upon graphic methods used by Darcy Thompson (1917), Bacon (1976). Similar methods are used in the work of Quetglas (2009) and the thesis of Victor-Hugo Velazquez (2012). The decision to explain findings using freehand sketch diagrams reflects the type of drawings and intended degree of precision considered most appropriate to the drawings analysed. The explanatory diagrams of Eisenstein such as those used to explain Choisy's theory of movement through the spaces of the Acropolis are taken as a reference (Eisenstein, 2001) (Fig. 71). Explanations of how sketching may serve an educational method are described through the cognitive research by

36 Eisenstein, 2001. See Tafuri, 1987, for an explanation of Eisenstein's analysis of Piranesi prints.

Goldschmidt (1991, 2003), Schön and Wiggins (1992) amongst others. The practical application of sketching as a means to develop design in the classroom has been used extensively throughout the modern era to recent times. Coderch, Roqueta, Torres are amongst many professors at ETSAB who have insisted on the importance of drawing during design. Sketching's role in scientific methods may be traced from the codices of Leonardo, through to the drawings of Ramon y Cajal, to the discovery of the structure of DNA.

This provides a method which although open-ended and to some degree subjective, is certainly not one where anything goes because the process of careful and intentional sketching works to not only control these aspects but also combine them with creative and intuitive observation. Therefore the method of graphic analysis through sketching is extremely relevant to the subject matter of the thesis (both travel drawing and design sketching) and to the nature of research in the field of architectural design. In-situ sketching is a process not a method which is an extension of the design process.

CHAPTER 4

LE CORBUSIER'S ACROPOLIS SKETCHES

A graphic analysis of Le Corbusier's insitu sketches of the Acropolis drawn in 1911 during his Voyage to the East.

As one of the most influential architects and architectural thinkers of the 20th century, Le Corbusier constantly relied on sketching to help organise and develop his thoughts. His sketches are not only records of his thoughts and opinions, but in fact they helped to shape his ways of thinking. From the start of his career up to his final projects, his sketches provide an exceptionally direct and personal window onto his thought process, both when reflecting on his own ideas and when reacting to things he observed around him. These were often minimal, fast and emotive sketches which he used both for analysing precedents and for developing his design ideas. Whereas in his early years he repeatedly expressed his dissatisfaction with his ability to express his ideas in writing (Daza 2015b), the comparative proximity between what he sketched and what he thought meant that

his sketches allow an incomparable insight into his developing opinions and his method of research.

This chapter investigates a turning point in Le Corbusier's formation as an architect, through analysing a set of the sketches he made on his first visit to the Acropolis in 1911 which are recorded in their original order in the Carnet 3 of the Voyage d'Orient (Corbusier, 2002).[37] These provide a complete record of a highly significant visit to this key architectural monument. This chapter approaches these sketches differently from the copious literature on this particular visit both in its approach and its results.[38] It treats his sketches as the evolving record of a learning process rather than as clear statements of definitive opinions. By applying a novel and detailed method of graphic analysis, the sequence of exploratory sketches reveals the growth of Le Corbusier's ideas and how he went about "designing" his interpretations of the Acropolis, its setting and its temples. This method allows a new appraisal of Le Corbusier's visit based exclusively on concurrent and in-situ sources, in contrast to the many accounts in the literature which instead focus primarily on his largely retrospective writings. The chapter also presents a range of ways in which Le Corbusier manipulated his sketches in order to develop and radicalise his opinions. This uncovers the graphic techniques underlying his analysis and design, revealing his highly intentional but also flexible and experimental method.

Fig. 77: TOP: Plan of Athens in 1910, showing Acropolis (1), Mount Lycabettus (2), the Pnyx (3) and the Agora (4). (Baedeker 1910).

Of all the buildings Le Corbusier studied during his Voyage to the East, across the Balkans, the eastern Mediterranean and Italy, it appears that his visit to the Acropolis was a revelation to the young architect and fundamentally altered his way of thinking about architecture from then on. The dramatic change in Le Corbusier's architectural thinking at this moment is described by Jacques Lucan (1987, pp.20-22) and referred to as a

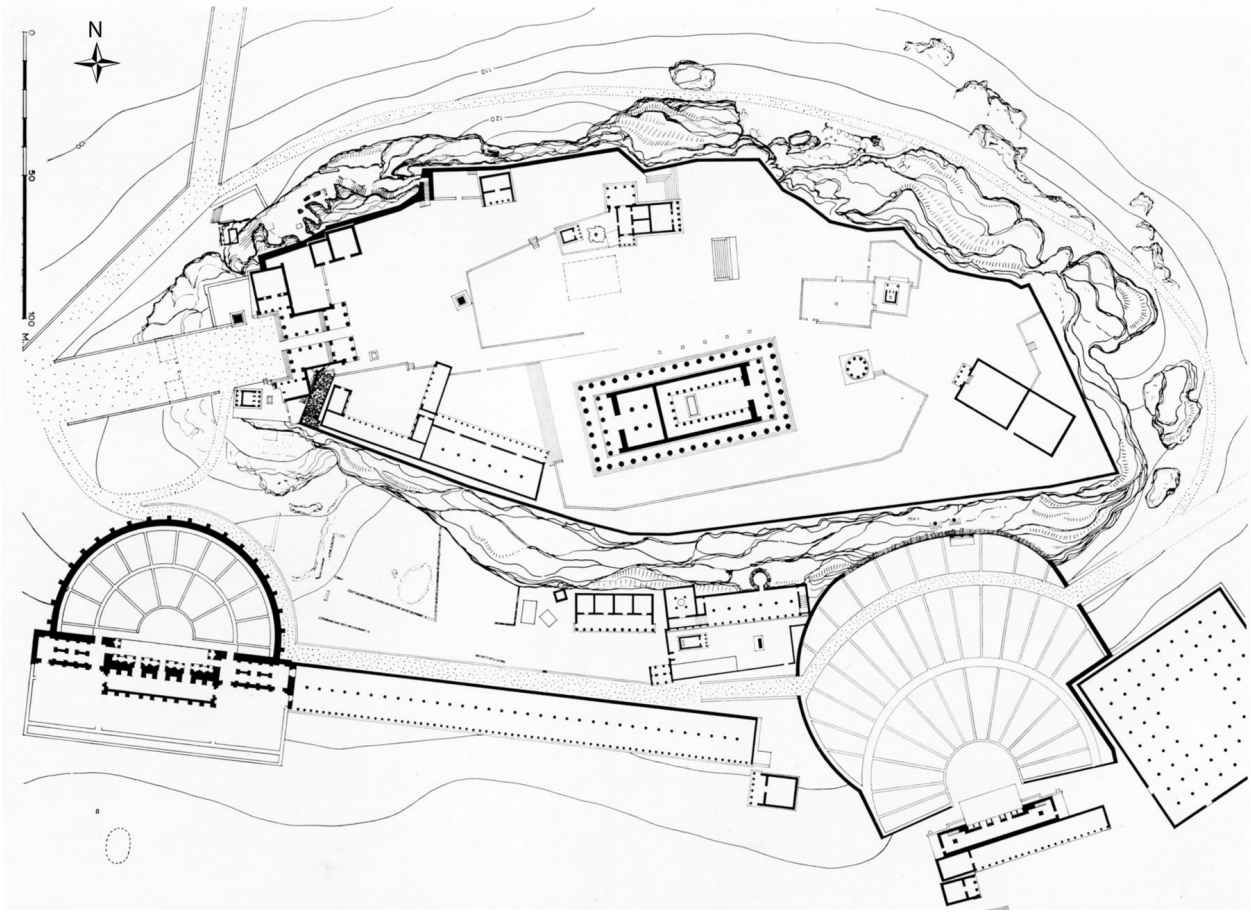
Fig. 76: RIGHT: Plan of the Acropolis (Traglos, I., 1967).

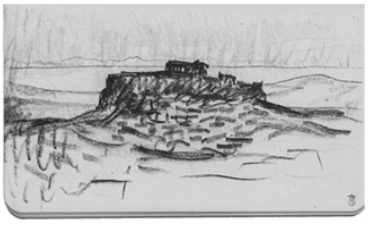
37 Due to their order in the Carnets, these have been preserved in their most likely original order. The sequence of sketches chart the evolution of his interpretations of the architecture and show that in contrast to Baker's opinion (Baker, 1996, p182) that Le Corbusier used drawing to imprint images on the mind (after the manner of his teacher l'Eplattenier), Le Corbusier's method of drawing on the Acropolis in particular, fast, excited, exploratory sketches served to actively propel his reasoning forward more than merely recording and memorising fixed conclusions.

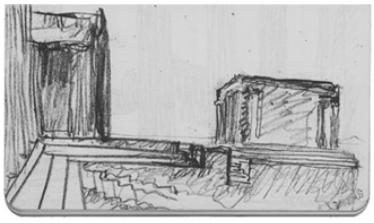
38 Amongst the main authors see: Frampton, 1997; Lucan, 1987; Cohen, 2014; Daza, 2012; Baker, 1996; Brooks, 1997; Amirante et al. 2015. See the Bibliography for further references.
Ricardo Daza provides a comprehensive account of Le Corbusier's Voyage to the Orient, accompanying an explanation of his typical daily visits to the Acropolis with Le Corbusier's texts, and other sources from the time.

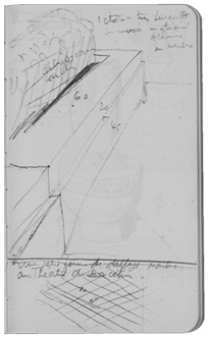
step change by Geoffrey Baker (1996, pp.174-187). Le Corbusier himself referred back to his experience of the Acropolis so often that J-L Cohen (2014, p.388) refers to it as a kind of “Acropolis syndrome”. Given the significance of the ideas which emerged during his visit on his later work, both theoretical and built, it is interesting to consider how his thoughts emerged and developed during his time in contact with the monument. This may shed light on his process of learning about precedents and appropriating architectural ideas.

Most scholars have based their research into this formative visit primarily on Le Corbusier’s own writings (Corbusier, 1966), however most of these were in fact written in retrospect and were influenced to varying degrees by his later reflections and the theories of others (Cohen, 2014. pp377-384; Brooks, 1999. pp279-285; Moos, 2009 pp30-34.). Apart from a few brief written notes and letters, the only concurrent record of his anzalysis in situ are photographs and a group of sketches. According to Lapuerta (1997), analysing original drawings can provide far less misleading evidence about an architect’s ideas than the written notes of author. This can provide information about the figurative world of the author and his references. It can also reveal his personal design process through comparing and contrasting different disregarded alternative sketches or designs. Original drawings and









in-situ sketches in particular may show reasons and justifications which are absent or different to those of other sources.

The set of sketches in Carnet 3 in particular gives a glimpse of his direct and immediate reaction to architecture and the sense of place he discovered there. However, until now, these have not been thoroughly studied as a sequential set of consecutive drawings using detailed graphic analysis (Hidalgo, 2000). In response to this, the current chapter makes an original contribution to the existing literature through using a method of graphic analysis to deconstruct the original sketches revealing their underlying logic and illustrating his method of reasoning which this reveals. The chapter contributes to the existing literature about Le Corbusier's formative voyage to the East in 1911 through the use of an original method of graphic analysis based on deconstructing the sketches into comparative diagrams. The results which this provides contrast in various respects with the generally established view. The intellectual metamorphosis which took place during this intense study of the Acropolis in 1911 is charted out by this analysis (Lucan, 1987). It questions what sequence of reasoning his ideas went through and how the process of sketching in fact determined the direction of his thoughts.

Fig. 78: TOP: In situ pencil sketches of the Acropolis, September 1911. TOP (left to right): pp. 98, 103, 104, 106+107, 109, 111. BOTTOM (left to right): 113, 115, 117, 119, 123, 125, 127 (LC, Voyage d'Orient, Carnet 3).

This analysis has two specific intentions. The first, and most direct, is to see which elements of the Acropolis he focused on and what ideas they suggested to him. This may be compared easily with his later theories and projects. Second, the chronological comparison of the sketches reveals the formation of these ideas, at what stage they arose, in response to what, which ideas increased in importance and which faded out, how individual concepts became more subtle, and how they were combined with other ideas to make complex multilayered conceptual images of architecture and place. This illustrates, albeit only partially, glimpses of the thought process behind the sketches and their analysis of the place revealing how the process of sketching has helped to develop Le Corbusier's train of thought and to design his overall holistic conception of the Acropolis.

The hypothesis is that the sketches focus on themes different to those often discussed from Le Corbusier's later texts, and which reflect his immediate preoccupations whilst in direct contact with the Acropolis. This research shows that he used sketching to actively investigate and learn rather than just to memorise what he saw. In fact various themes crucial to his later work were not only illustrated, but were actually developed in-situ through us-

Fig. 80: STEP 1 – redrawing of selected elements: (Top down) Outlines; tone; graphic composition of primary elements; main volumes; description of spatial qualities.

Fig. 79: STEP 2 – Analytical drawings: (Top down) Balance of tone and texture; Contrast and articulation of elements; planes of depth; Graphic composition; Vanishing points; redrawing alternative versions; Structure of sequential spaces.

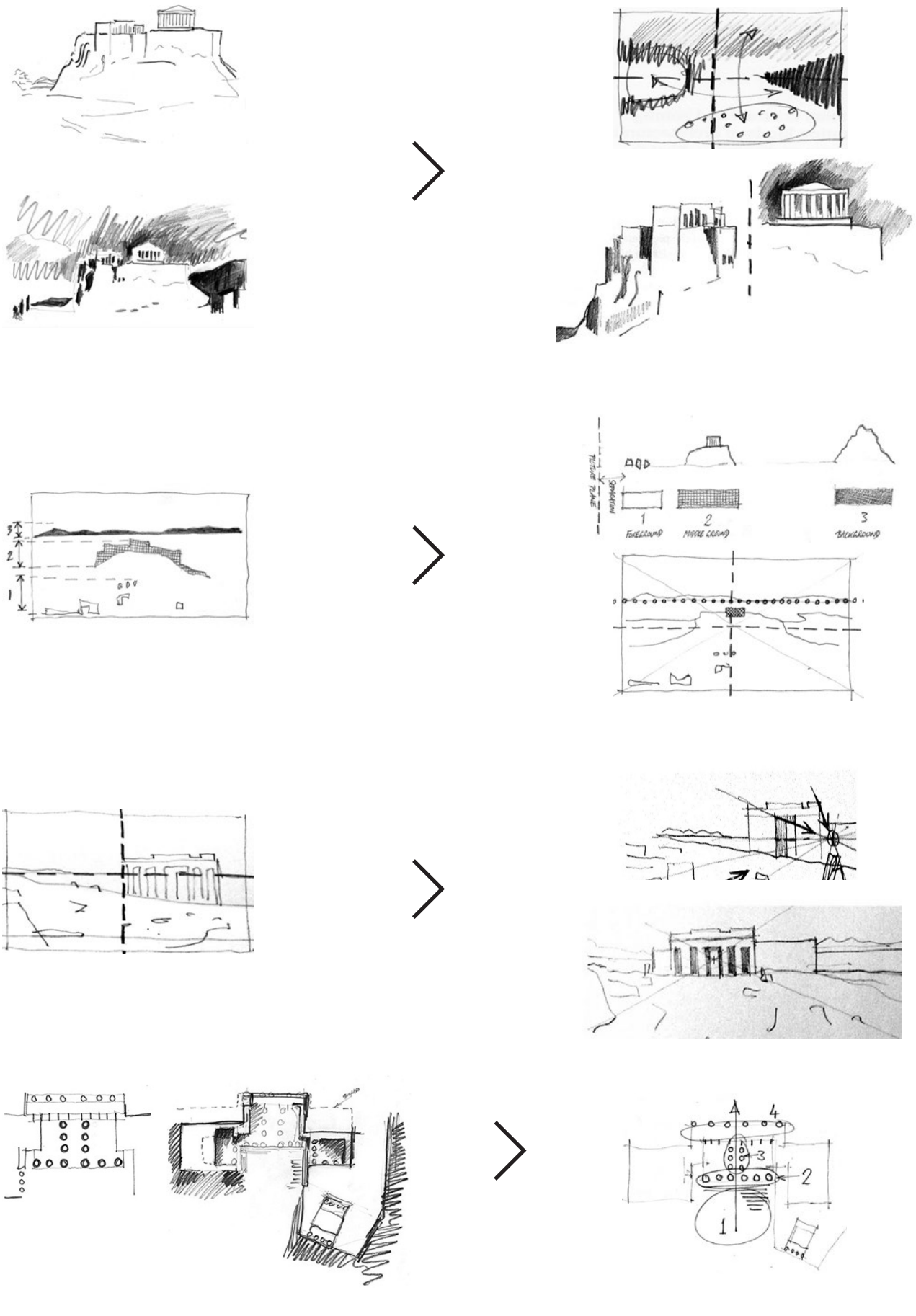
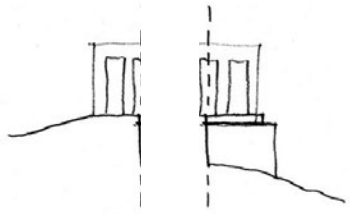
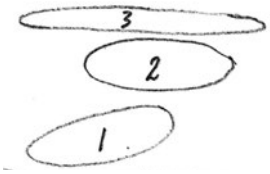
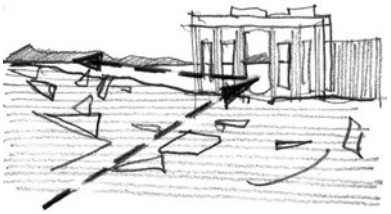
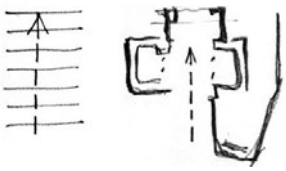


Fig. 81: STEP 3 – conceptual diagrams: (Top down) Architecture and ground; Depth of field; Visual pathways; Spatial sequence.









ing his sketches to experiment with and refine his analysis. Combining his prior knowledge of the Acropolis with direct observation, the process of sketching on location helped to transform his thoughts into original interpretations of the essence of classical architecture and to discover its new relevance in the context of the twentieth century. This leads to a number of conclusions regarding the focus of Le Corbusier's thoughts when he was on location which extend, and in certain respects contrast with the prevailing views about the influence of the Acropolis on his later work.

As with any drawing made on location, local immediate circumstances inevitably affect the development and outcome of the image, such is the nature of the travel sketch. However therein lies much of the interest for the researcher who wishes to understand the thought process behind the picture, as it is the sketcher's response to these external influences which is recorded. This can reveal as much about what the sketcher was thinking at the time of drawing, as about the specific conditions of the surroundings at that particular moment. Such thoughts may have been intentional (in that they came first and the drawing was intended to convey a particular preformed impression) or only appreciated as a result of drawing (becoming noticeable only once they had been drawn). Which of these two alternatives, or what combination of them actually occurred may be impossible to tell in retrospect, nevertheless the fact remains that if a particular idea has appeared on the page, then it has passed through the mind and the hand of the sketcher, who if sensitive and concentrated will not fail to notice their significance. For example, of Le Corbusier's first three sketches of the Acropolis from the distance, pp.98, 103 and 104, show similar views drawn in different ways. Some commentators explain that this reflects the changing atmospheric conditions during the late September afternoon. Indeed Le Corbusier's own written account describes his memory of the sun setting, the lights coming on in the city below and the changing presence of the Acropolis in relation to its context. In a similar way, the different heights of the horizon in relation to the Acropolis might have no other reason than that they happened to overlap (in the later sketches) from the point were Le Corbusier was drawing. On the other hand, given the care and interest which Le Corbusier devoted to these particular questions throughout his career, it seems just as likely that he consciously waited for the sun to set before making his next drawing, and that, unsatisfied with his first composition, he deliberately walked a little way down Mount Lycabettus to the height were

the Parthenon lined up with the horizon. Given Le Corbusier's concern's about waiting until the ideal moment of the day to see the Acropolis (Baker, 1996, p.175.), it would seem consistent that he had a clear intention of drawing the Acropolis under different light conditions. Therefore, although the specific characteristics of each sketch may be explained as no more than a representation of the particular conditions which by chance occurred at the time, it appears more likely that Le Corbusier intended to represent the Acropolis in context under the conditions of weather and light which he deliberately selected.

The purpose of basing his analysis on in-situ observation as opposed to reading other sources meant that his impression of the Acropolis was determined by what he found and saw. The silhouette of the Parthenon against the dazzling sunlight reflecting off the sea is bound to give temple and cliff a united monolithic appearance. Nevertheless, with every sketch, Le Corbusier reached a point were he drew what he chose to see and record - in effect what he chose to "design". The Piraeus coastline, in fact visible even if relatively unbuilt at that moment, is omitted from sketch 125[39]. Poetic license allows Le Corbusier to modify the porticoes and open spaces of sketch 113. On the continuation of his journey past Delphi in the weeks after visiting the Acropolis, his sketches even show his imagined reconstruction of the temple of Apollo which lay in ruins (Daza, 2015). All of this indicates that these sketches are a constant dialogue between what Le Corbusier observed and the image he chose to see. These sketches can provide a unique glimpse of how Le Corbusier interpreted what he saw, rather than just an objective graphic record of the Acropolis in 1911. The following analysis aims to explain how this conceptual process of imaginative design was guided by the process of drawing in-situ.

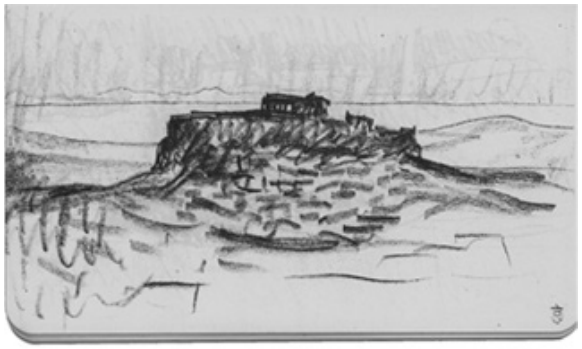
Fig. 82: TOP: The Propylaea facing south, p.125. (LC, Voyage d'Orient, Carnet 3).
Fig. 83: MIDDLE: Sketch of the Propylaea showing the Piraeus coastline in 2014. The distant mountains were not visible due to poor atmospheric visibility at the time of drawing (SH in-situ)
Fig. 84: BOTTOM: Diagram showing the coastline omitted from Le Corbusier's sketch 125. (SH).

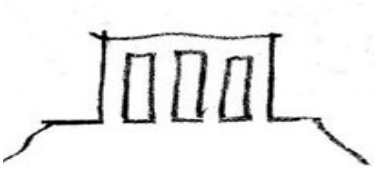
De la Sota was in favour of copying sketches of great architects in order to feel what they felt as they drew. This can only be positive: Celini writes that the hand has the intelligent skill to pick flowers, and does not want to pick thorns (Lapuerta, 1997, pp.114-5). This graphic analysis is based on using re-drawing as a technique to investigate Le Corbusier's original in-situ sketches thereby taking advantage of the intelligent skill of the hand to help understand his original thoughts.

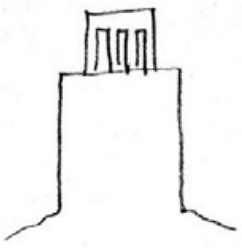
39 See Gresleri's notes in the translation of the original text of Carnet 3. Voyage D'Orient, Vol.6, trans. Munson and Shore (2002). Electa 1987. pp122-3

This analysis compares the set of original sketches of the Acropolis in the Carnet 3 of the Voyage d'Orient, following a method of graphic analysis based on that used by Josep Quetglas in his organisation of the Villa Savoye drawings (Quetglas, 2009; Velasquez, 2012). Due to the fact that the original sketches are preserved in chronological order, and share equivalent formats and similar content, the set may be compared and contrasted with an unusual degree of precision. Two particular architectural themes have been selected for the following analysis: the relationship between architecture and the ground, and the dynamic experience of architectural space through movement. These have been selected for two reasons: First, for the importance Le Corbusier attributed to them in both the Acropolis and his own work (Corbusier, 1923, 1942); and second because their influence on each one of these carnet sketches can be clearly seen to evolve throughout the sequence. In order to compare like with like and minimise the number of variables between drawings (Thompson, 1917) the original sketches have been redrawn by the author in the form of diagrams. This enables clear and direct comparison across the range of sketches and viewpoints. Each set of diagrams focuses on specific graphic characteristics of the sketches and reduces the information in each to its essential minimum. These analyse the graphic construction of the sketches, focusing on changes in composition, scale, proportion, perspective and view point, context, spatial continuity and depths of field (foreground, middleground and background), as well as the various drawing techniques Le Corbusier used, including different qualities of line and shading. Comparing the resulting diagrams in chronological sequence shows the direction in which his thoughts moved and the degree to which they changed.

The results of the analysis explain first the relationship between architecture and ground, and the role of various types of platform and plinth. The second section considers the role of movement in Le Corbusier's representation of the Acropolis. The final section draws conclusions about Le Corbusier's use of sketching from the results of the detailed analysis of his in-situ sketches. Original sketches by Le Corbusier are referred to by the page number in the Carnet 3 from the Voyage d'Orient. All other sketches and diagrams are by the author (SH, the author's initials, is written in the captions).







Variations on temples integrated into the ground. - temples and ground are fused together forming a single volume. The junction between ground and building disappears.

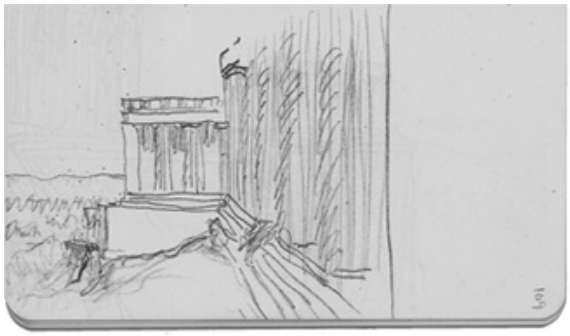
Fig. 85: Sketches of the Acropolis, p. 103 (left); p. 107 (right); with details below (LC, Voyage d'Orient, Carnet 3).

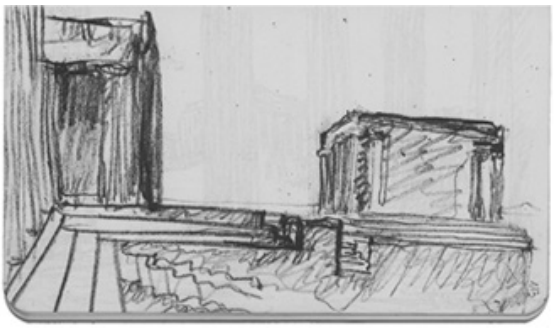
Architecture, Base and Ground

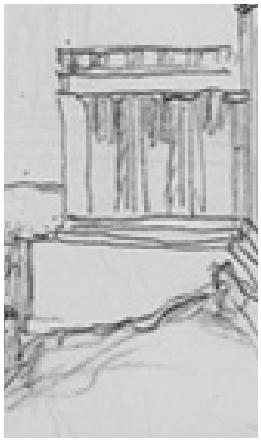
Two themes are developed across the sequence of sketches. First temples and ground are fused together forming a single volume. The junction between ground and building disappears. The second develops the opposite idea where the temple becomes increasingly separated from the ground by layers of steps which act as a plinth, similar to the sculptures drawn at the archeological museum.

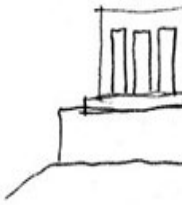
The diagrams show the physical relationship between architectural object and the ground. Le Corbusier has treated the line or lines that divide them differently throughout the course of the sketches. These treatments tend towards two contrasting approaches: integration or separation. In the first, the junction between them is reduced and blurred to the point that temple and cliff merge together forming one continuous mass, or at most an orthogonal capping to an organically formed cliff-face.

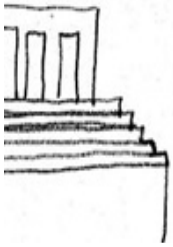
Fig. 86: Concept diagrams based on original sketches. (SH)











Variations on buildings increasingly separated from the ground by layers of steps which act as a plinth, similar to the sculptures drawn at the archeological museum.

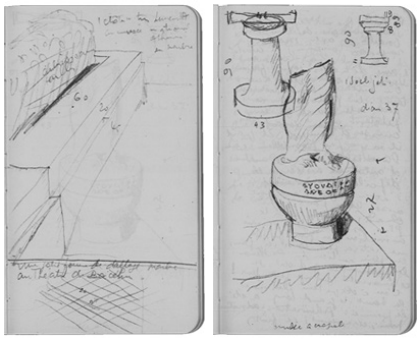
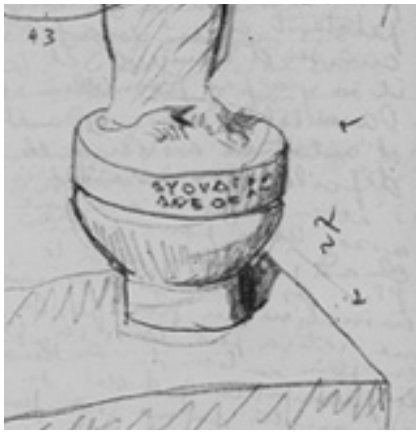


Fig. 87: Sketches of the Acropolis, p. 109 (left); p. 113 (middle); pp.117+119 (right); with details below (LC, Voyage d'Orient, Carnet 3).



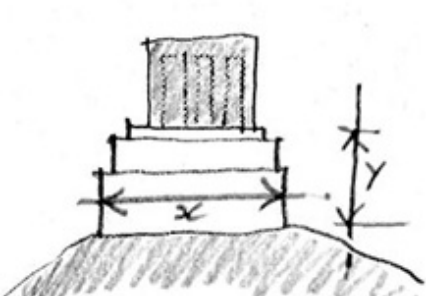
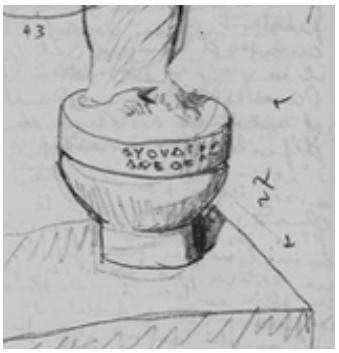
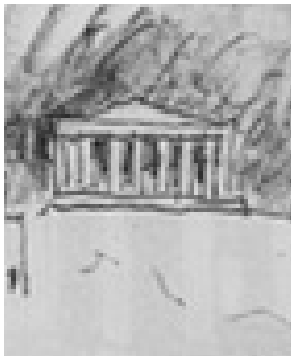
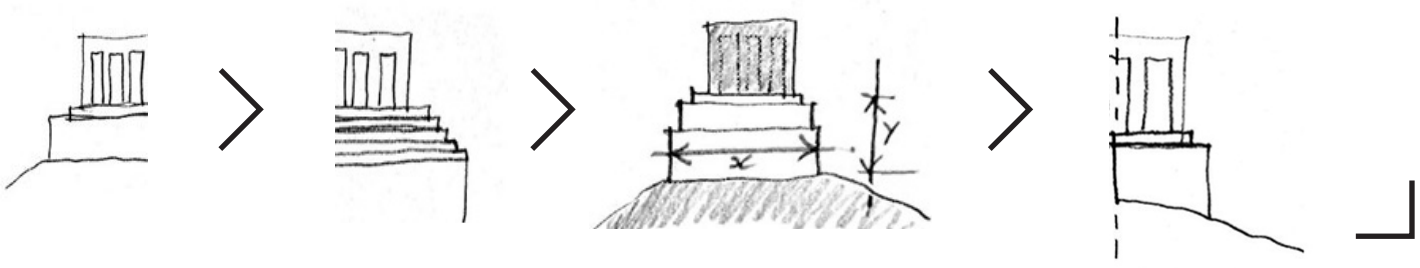


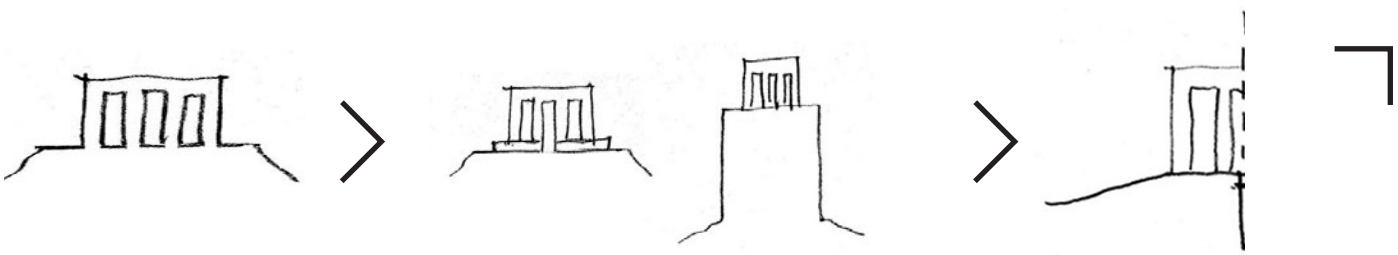
Fig. 88: Concept diagrams based on original sketches. (SH)

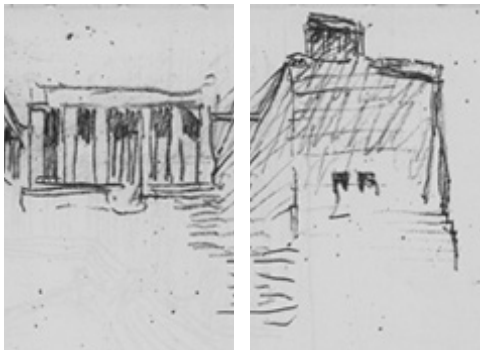
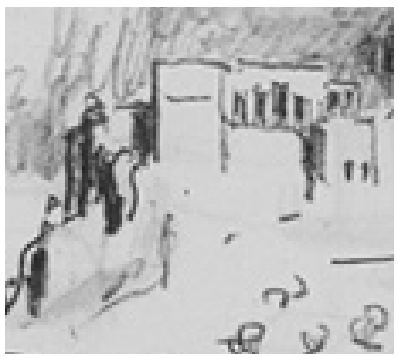
The second group develop the dividing line to form a distinct layer separating building from ground. This layer, in the form of horizontal lines representing steps is treated with greater interest as the sketches continue. The lines are repeated into multiple steps, increasing care is taken over their direction, their parallel orientation and perspective. They become emphasised as the darkest, most emphatic lines of the image, the boundary between two opposing elements: organic form/orthogonal geometry, natural/artificial etc. The same idea is even extended in the parallel theme of sculptures, plinths and ground. All three components are drawn, including the ground plane despite its apparent lack of interest. But the focus of the sketcher's concentration and effort has been directed at the plinth rather than the sculpture on top. The focus is not on the obvious object but on the analysis of what it is that makes us appreciate the object in a particular way. This approach which highlights the interface between building and ground as much as the building itself, exemplifies Le Corbusier's investigative approach to drawing the Acropolis and reveals why he sketched: to investigate how architectural design influences our perception of place.



Juxtaposition of ground/architecture conditions: integration around the Propylaea to the left, and separation of the Parthenon to the right.



Having explained these two contrasting approaches, the final sketch of the Acropolis south western facade, the canonical view showing Parthenon and Propylaea. The Propylaea forms a capping to the cliff, designed to fit around the topography of the rock adapting itself to the contours of the ground, but also modifying the outline of the cliff top to form the entrance slope and bastion walls. In this entrance, both nature and architecture interact with each other each modifying and determining the form of the other to achieve the function and architectural effect.

On the right the Parthenon is separated from the ground plane by a double parallel line highlighting the total division between ground and architecture. Both sides of this division are accentuated further by the tonal contrast of the sun-lit stone against the shade of the thunderclouds and background hills. The emphasis of these dividing lines depicts an architecture which stands out in contrast to nature forming a sense of place characterised by its distinction from its surroundings, focusing instead on rhythm and proportion within the temple itself but independent from any direct connection with its immediate context. The Propylaea is an element of bilateral integration with the natural setting, it has been adapted to fit the form of the cliff, whilst the cliff has also been modified into the form of the walls and stairs. On the other hand the Parthenon becomes the opposite, contrasting dramatically with its thunderous backdrop and bleached out base. The Doric order does not just set one kind of relationship with the ground, but depends on its context and position and can be used to create opposite effects. Le Corbusier learnt that the architecture of the Acropolis was not just a questions of proportions and orders, but as a set of buildings carefully and intentionally linked to their site and purpose. The character of these two contrasting but equally important relationships between architecture and place are conveyed through the manner in which they have been drawn. This way of representing each idea can be seen to have evolved through repeated trial experiment and intensification. The set of sketches therefore show how drawing has helped to develop, question and radicalise these concepts before producing a final dual representation of these two contrasting ways in which the relationship of architecture with its ground can create a particular and immensely powerful sense of place.

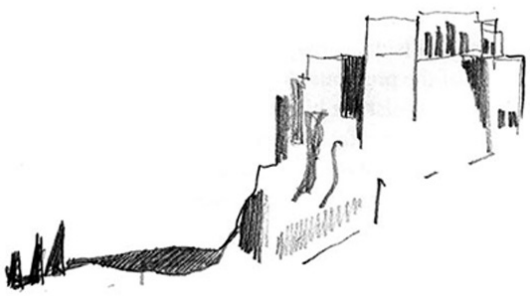


Fig. 89: Sketch of the Acropolis, p. 98 (LC, Voyage d'Orient, Carnet 3).

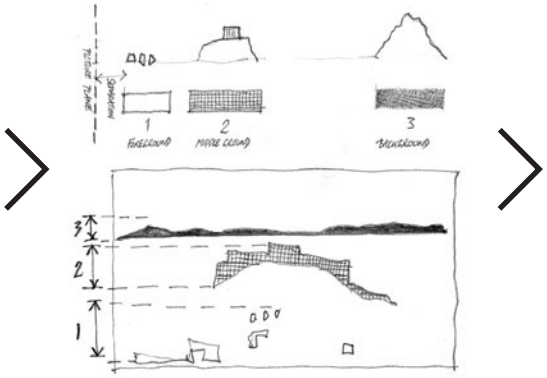


Fig. 90: Redrawing of selected elements and analysis: planes of depth (SH)

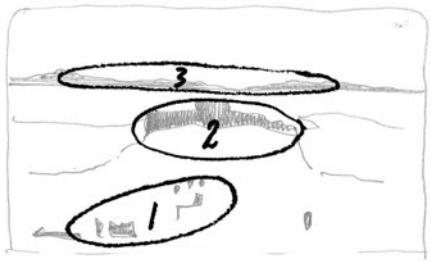


Fig. 91: Diagramatic representation of planes of depth (depth of field). 1=foreground; 2=middleground; 3=background (SH)

Depth

Throughout the carnet, the horizon forms another essential component of the sketches. As well as the interface between temple and ground, one positioned vertically above the other, another horizontal relationship exists in the spatial depth between the viewer, architecture and horizon. Like the relationship between ground and building, the spatial organisation of the sketches becomes increasingly complex as the carnet proceeds. Relationships between different planes of depth within the picture space are developed through experimentation and refinement from one sketch to the next. This provides an interesting theme for research first because it evolves in clear steps towards increasingly sophisticated results in the later sketches, and second for the change in conception it belies from the picturesque representation of the Acropolis in its landscape setting, to an analysis of sequential spaces and the movement which they encourage. The arrangement of depth in the sketches explores significant ways in which the architecture frames particular relationships between the viewer and place – extending across the entire range of visibility from foreground to distant horizon. The attention Le Corbusier paid to the intentional portrayal of depth in his compositions can be seen in the following analysis where depth is subdivided into three principle planes: foreground, middle-ground and background.

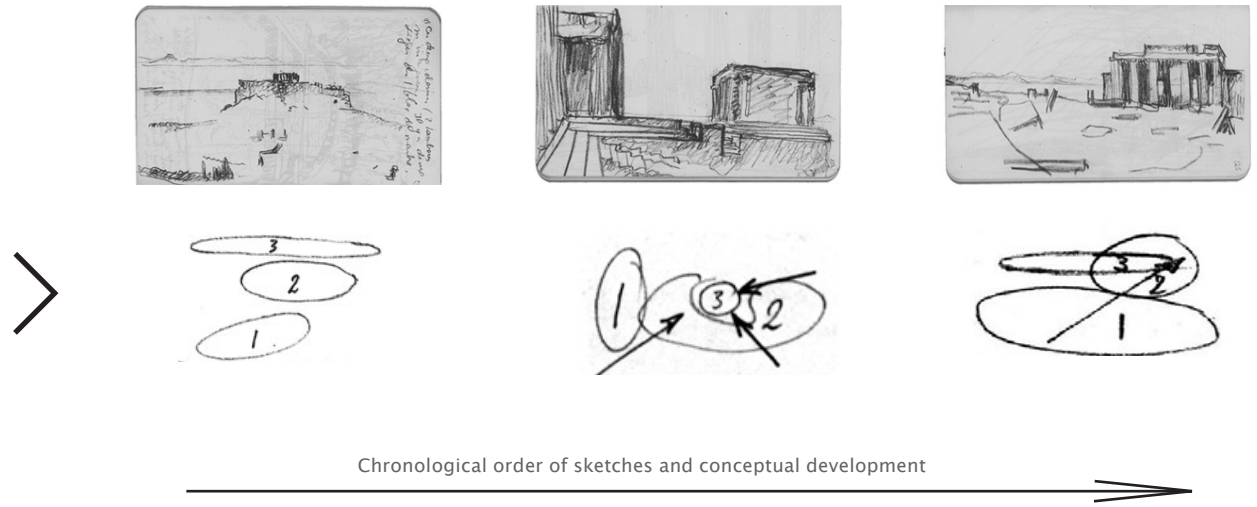


Fig. 92: Comparison of depth of field diagrams across the sequence of sketches in original chronological order (SH). These show the relationships between planes become increasingly complex across the series of sketches. Original sketches: p. 98, 113, 125 (LC, Voyage d'Orient, Carnet 3).

The relationships between different planes within the sketch which represent regions of different depths is analysed by schematically subdividing the sketch into three regions: foreground, middle-ground and distance.
Comparison of the first and last sketches of the Acropolis in the Carnets shows a significant difference in complexity of depth of field, from the vertical arrangement of isolated regions to overlapping fields with space receding diagonally into the distance, accentuating the continuity of the foreground space of the viewer with the contrasting depth of the horizon.

Le Corbusier uses sketches to test out and evaluate different relationships between three primary levels of depth in different views and buildings. Gradually his method of representing them develops towards overlapping different depths and choosing compositions in which the architecture enhances the dramatically contrast between near and far. This highlights the importance of architecture for accentuating and revealing the impact of the horizon on place.

The composition of depth develops in four principle ways throughout these sketches:

Fig. 94: TOP: Sketches of the Acropolis, (from left) pp. 98, 113, 115, 125 (LC, Voyage d'Orient, Carnet 3).

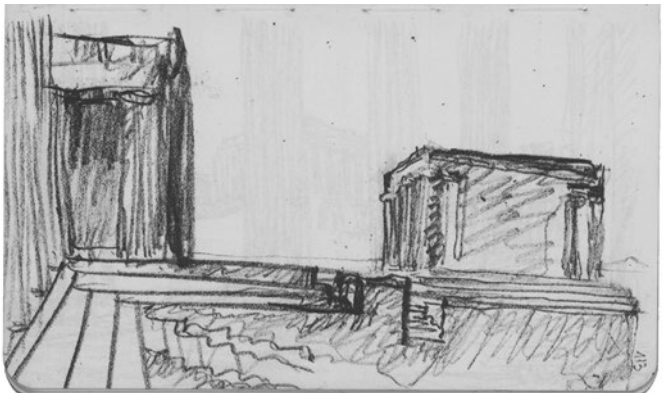
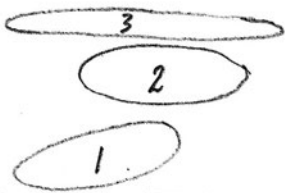


Fig. 93: MIDDLE: Depth of field diagrams. 1=foreground; 2=middleground; 3=background (SH)



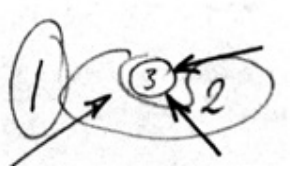
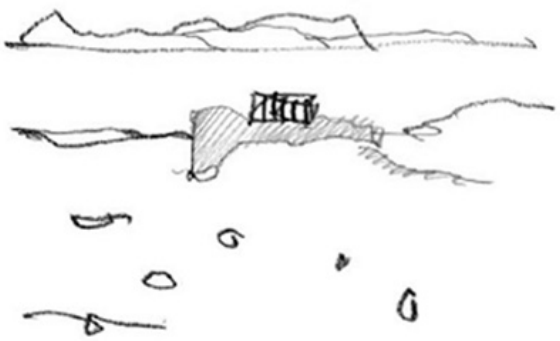
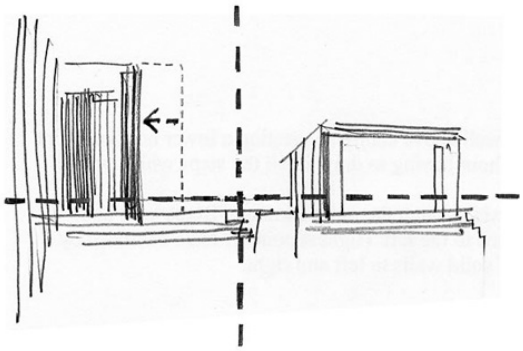
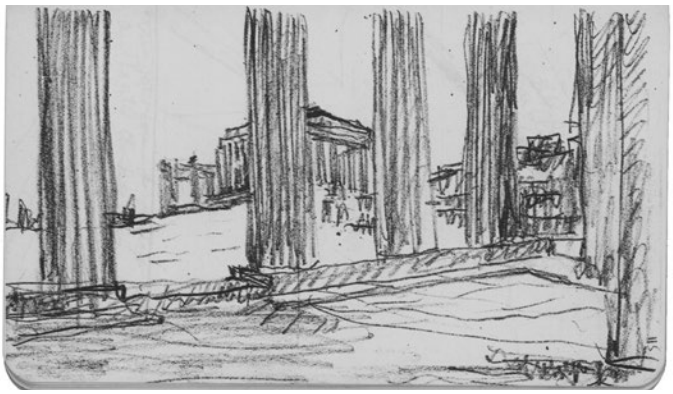
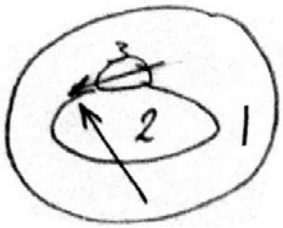


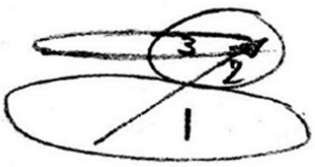
Fig. 95: BOTTOM: Composition analysis of the planes of depth in original sketch (SH)

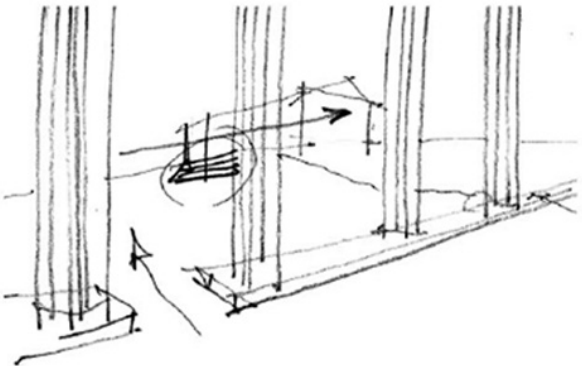


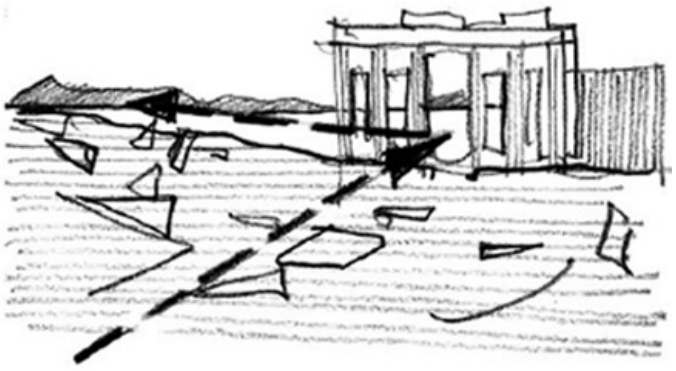





2
1


3
2
1





1 - The degree of separation between planes of depth. From separate isolated planes to continuous fields of spaces receding in depth, blurring the distinction between planes or joining them together.
2 - The position of each plane in relation to the rest, from vertical juxtaposition of planes to diagonal and overlapping arrangements.
3 - The location of the sketcher's viewpoint. The sketcher at first remains isolated from the picture space, later the foreground is extended up to location of the viewpoint.
4 - The visible portrayal of the intended pathway through the spaces.

There are many intermediate stages between these two, showing how the ideas developed through a series of experiments tending increasingly towards compositions which juxtapose and overlap different depths of field in order to accentuate specific characteristics of the buildings and the relationship that this establishes between architecture and setting.

Through combining similar elements in different compositions, Le Corbusier manages to accentuate specific relationships be-

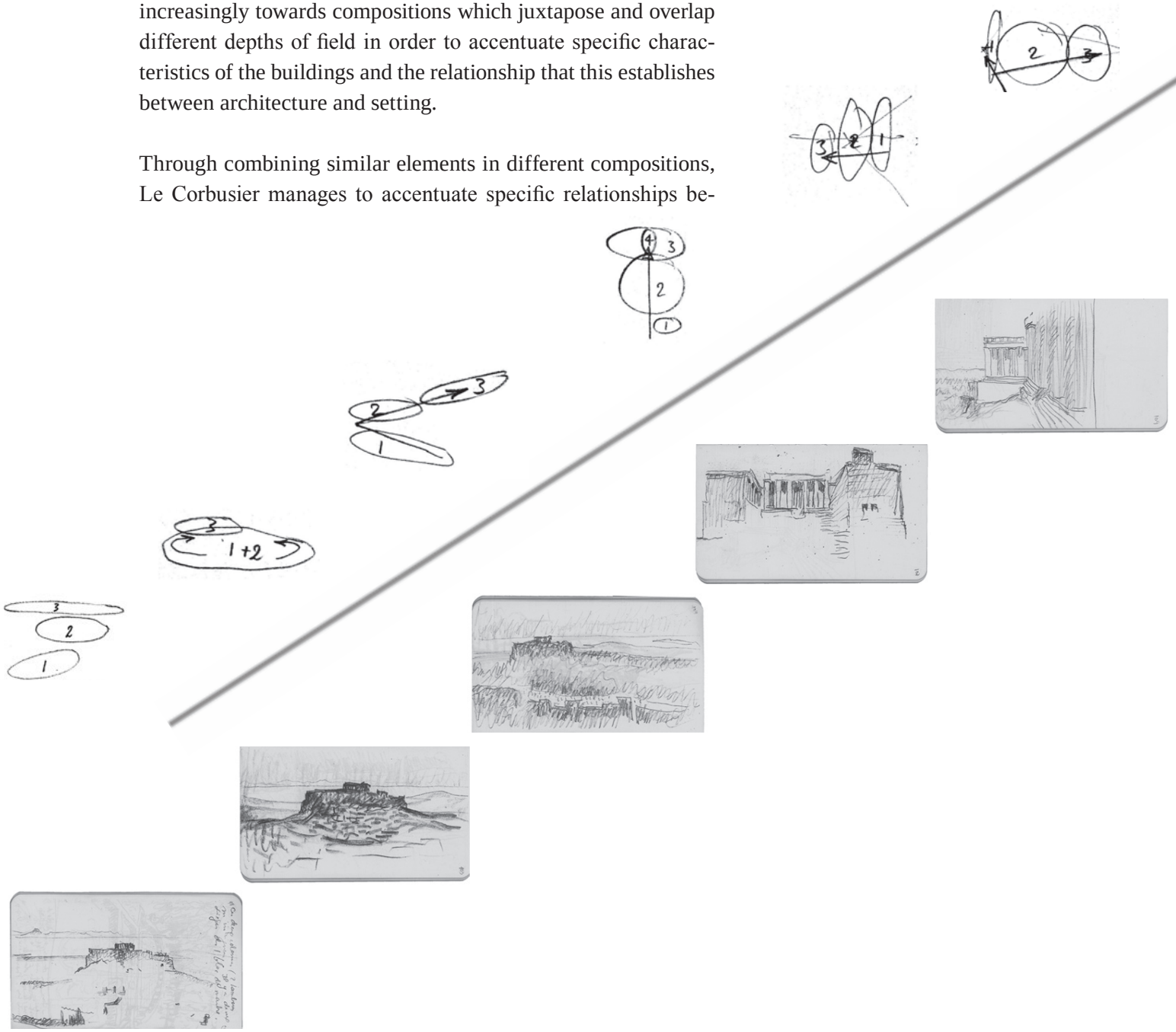
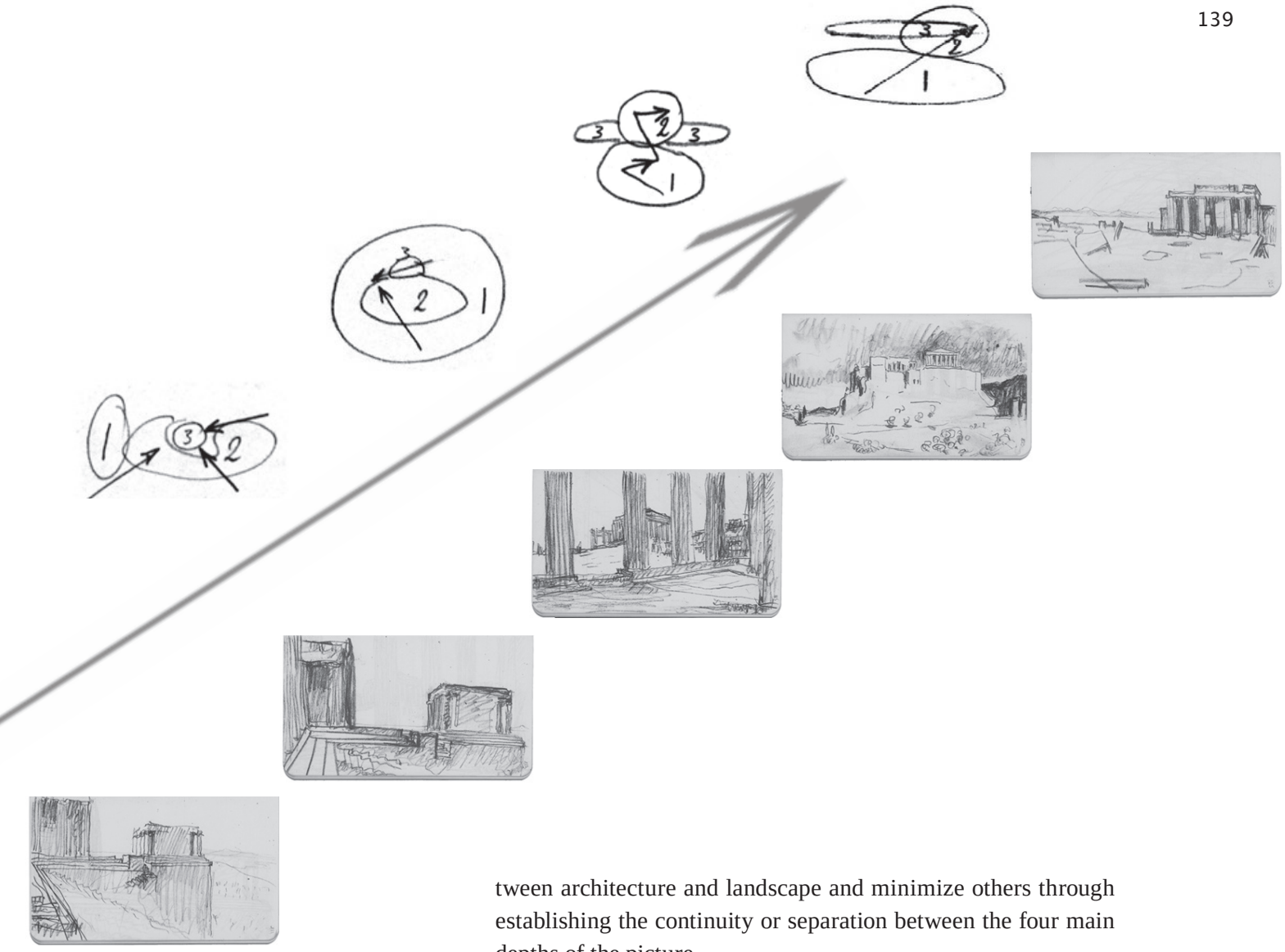


Fig. 96: Sketches of the Acropolis, (from left) pp. 98, 103, 104, 107, 109, 111, 113, 115, 123, 125 (LC, Voyage d'Orient, Carnet 3).
Fig. 97: Depth of field diagrams showing increasingly complex relationships between planes across the series of sketches. 1=foreground; 2=middleground; 3=background (SH)

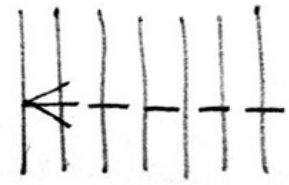


tween architecture and landscape and minimize others through establishing the continuity or separation between the four main depths of the picture.

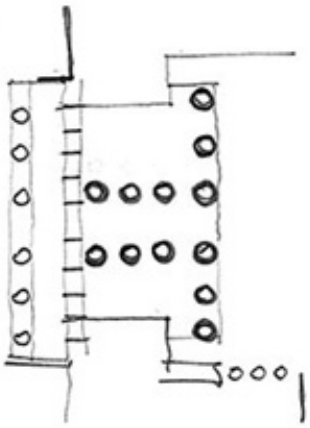
During the course of the sketches, he finds that the position of the built elements can enhance the impact of the far distance on the immediate foreground space. This heightens the connection between near and far and connects architecture to place on a large scale, whilst effectively ignoring the middle distance.

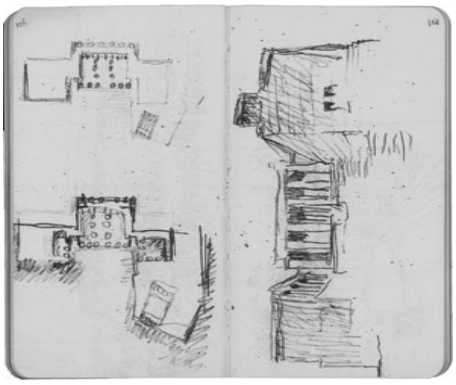
The rhythm of columns or the sequence of spaces and surrounding volumes

The difference between the way in which the two plans (sketched alongside one another on p106, (Fig. 98) have been drawn belies a change in intention. Interest switches its focus from emphasising the rhythm of elements to describing the peripheral spaces and three-dimensional volume.



The upper (first) plan, highlights those elements which Le Corbusier was most familiar with before his visit. His ink drawings from the previous year (drawn whilst in Berlin, see Daza 2015a) concentrate on the disposition of columns in both the Parthenon and the propylaea. This illustrate space through a series of points linked together with a particular scale and rhythm. In the lower (later) plan, the focus changes to the surrounding three-dimensional spatial sequence, suggesting solid and void, solid walls and level changes. The two flanking walls which enclose the entrance path become visually more significant than the row of internal columns.





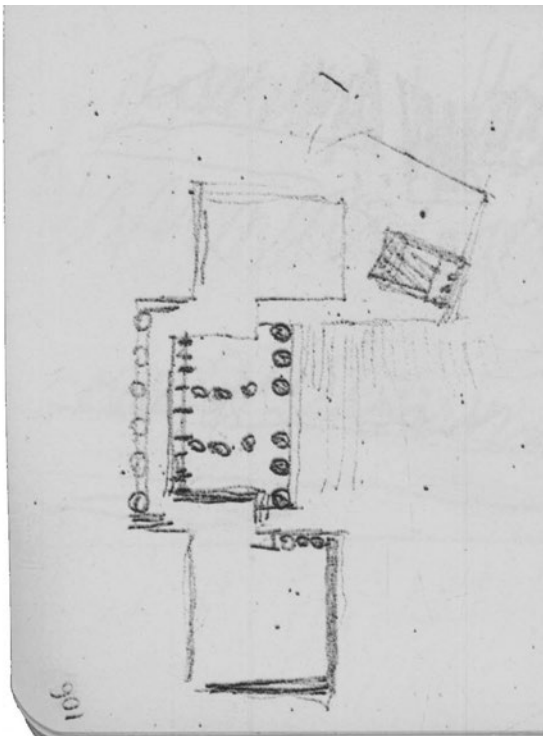
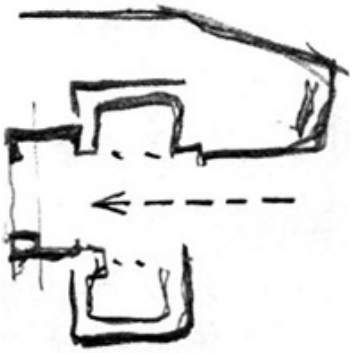
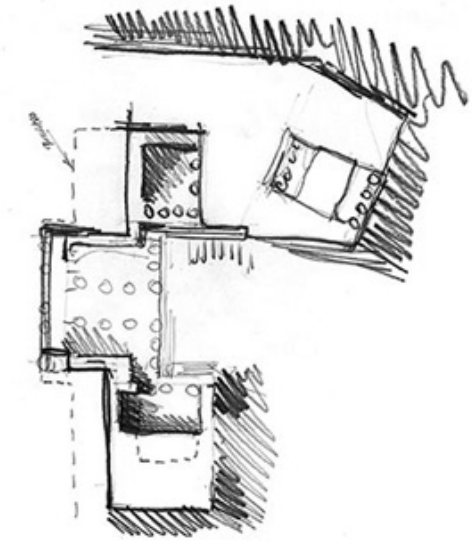
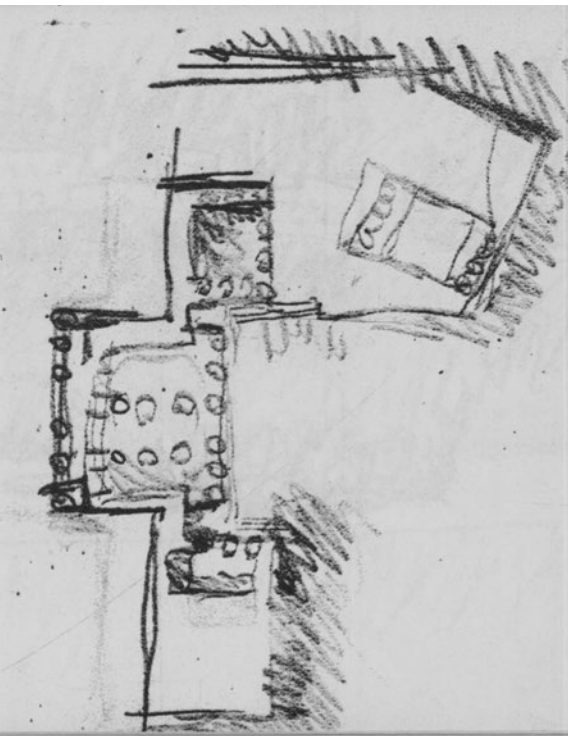


Fig. 98: ABOVE: Sketchplans and perspective of the Propylaea, (p. 106, 107) (LC, Voyage d'Orient, Carnet 3).
Fig. 99: BOTTOM RIGHT: Sketchplans of the Propylaea, (p. 106, first plan (left), second plan (right) pp. 98, 125 (LC, Voyage d'Orient, Carnet 3).
Fig. 100: TOP RIGHT: Composition analysis of the principal building components which form the architectural sequence in the original sketchplans (SH)
Fig. 101: Diagrams of the corresponding spatial structures. (SH)







The two plans show the start of a change from abstract thinking in terms of plan form and prior knowledge, to representing the main factors which influenced his own direct personal experience.

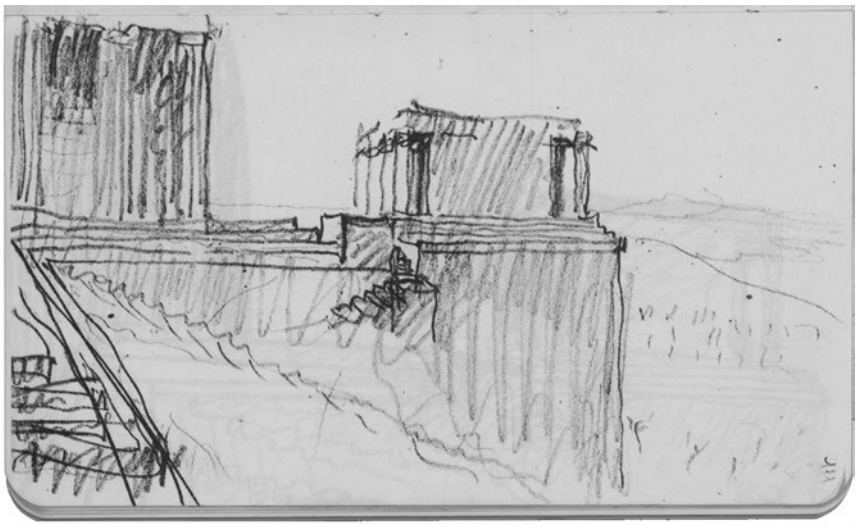
Comparison of the two plans drawn on page 106, both of the Propylaea and entrance to the Acropolis, shows the practical intention behind these sketches. Both are exploratory sketches, clearly not copied from other plans but worked out in-situ, as can be seen from the mistaken proportions which are partially corrected in the lower sketch, but which still show lines rubbed out and redrawn. Their purpose was to help Le Corbusier understand the arrangement of the architecture from first hand experience, working out proportions and spatial sequence and volume from his own observation.

The two plans also show a significant change in conception of the architecture. The heavier line-weight shows that the upper plan focuses its attention primarily on the set of columns in the Propylaea. These show a space governed by a rhythm along a linear axis. The focus on the columns alone concentrates on a one-directional movement through space marked out by quantifiable units symmetrically arranged. The lower, and most likely second plan concentrates instead on showing the volumes surrounding the entrance to either side of the visitor's pathway. The rough hatching serves to emphasise differences in level and the open spaces of the buildings in contrast to the empty blank areas of solid structure. This way of drawing focuses less on rhythmic axial progression and more on expressing the actual spatial quality of the approach between high walls and peripheral porticoed spaces to either side. The emphasis appears to develop from a more quantitative representation of columns, relating directly to his prior knowledge of the plan form published by Choisy, to a more qualitative analysis based on the real life perception from his own physical experience in-situ.

The comparison of sketches 111 and 113 show the same subject but slight changes in composition dramatically alter the major concept of the architecture portrayed. The emphasis in 111 lies on the temple of Athene Nike supported on the wall forming in effect a plinth and framed against the landscape, hills, coastline and distant islands beyond. The focal point of the composition of 113 shifts to the left centring on the space between the two built volumes to either side. These frame the distant horizon line of the sea, leaving the landscape off the edge of the picture to the right. The principal idea of this sketch appears to be this contrast between solid and void and how the positioning of the architecture frames the horizon connecting foreground and distance, whilst removing the middle ground of the nearby coast. In order to enhance this impression, give greater importance to the horizon and create greater balance between open space and solid stone, the portico on the left has been modified (as may be clearly seen by comparing to the previous sketch).

Fig. 102: Sketch of the Propylaea and Temple of Athene Nike, p.111 (LC, Voyage d'Orient, Carnet 3).

Fig. 103: Analysis of graphic composition of the original sketch, showing building volumes, horizon and landscape. (SH)



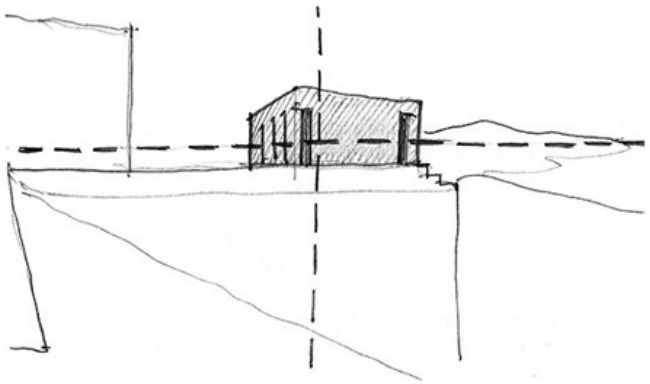
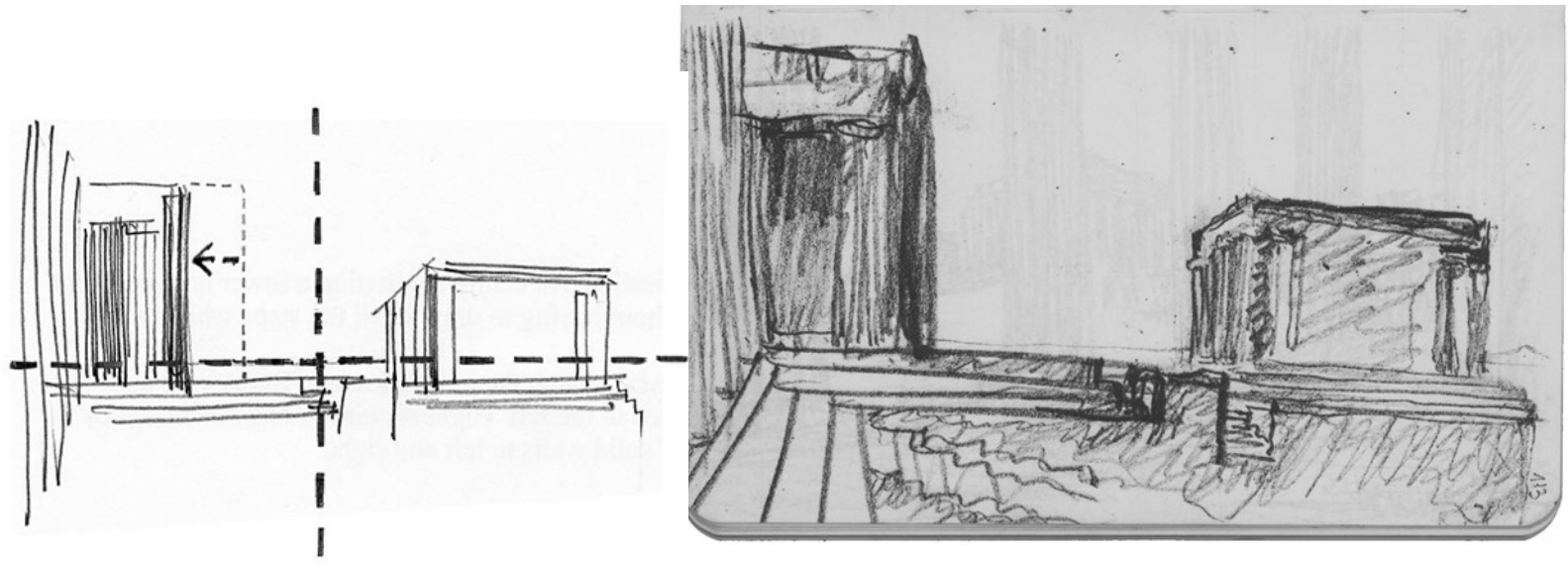


Fig. 104: Sketch of the Propylaea and Temple of Athene Nike, p.113 (LC, Voyage d'Orient, Carnet 3).

Fig. 105: Analysis of graphic composition of the original sketch, showing positioning and scale of building volumes (including LC's intentional foreshortening) and horizon. (SH)



Graphic balance

The pictorial composition of the sketches becomes gradually more intense during the course of the sketches. Although the sketches are small and quickly drawn, each part of each sketch has been carefully considered in relation to the rest of the sketch. Through accentuating symmetry or contrast, the overall composition of certain sketches becomes either more balanced and monumental or more dramatic. In sketch 107, a variety of similar elements mirrored by other similar elements across a central vertical axis are drawn in a similar way showing how the architecture enhances the effect of symmetry and similarity between the two flanking volumes which are distinctly unequal. This accentuates the sense of order and the monumental impression of the entrance buildings.

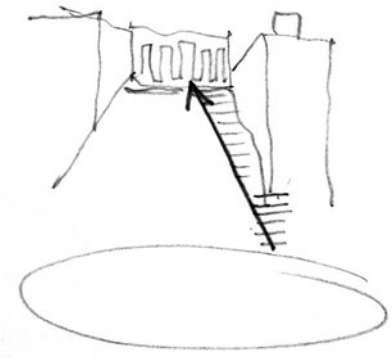


Fig. 106: Comparative diagrams (based on LC p.107 and p.123) showing directions of movement along a visible pathway. Foreground is left undrawn in 107, but included in 123. (SH)

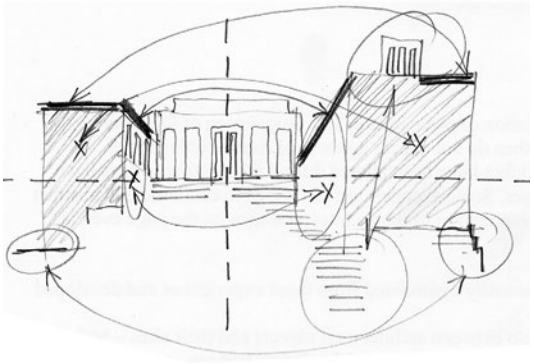
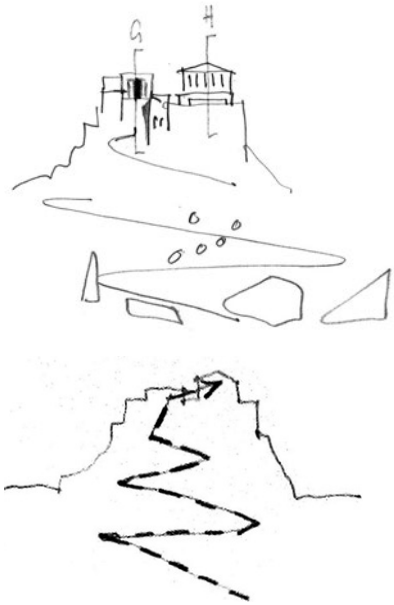


Fig. 107: Analysis of graphic composition of sketches 107 and 123. In 107, graphic components (outline, shading, volume) are mirrored across horizontal and vertical centrelines. (SH)

Fig. 108: Sketch of the Propylaea and Temple of Athene Nike, Southwest facade, p.107 (LC, Voyage d'Orient, Carnet 3).



Sketch 123 however uses the pictorial composition of the sketch to emphasise the contrast between two major architectural elements, the entrance Propylaea and the Parthenon. Contrasting textures and areas of tone are balanced across horizontal and vertical axes accentuating the dramatic contrast across the sketch. This provides a more dramatic way of structuring the image helping to focus attention on the various crucial parts of the architecture, but above all to highlight the contrasting conception of the two architectural groups.

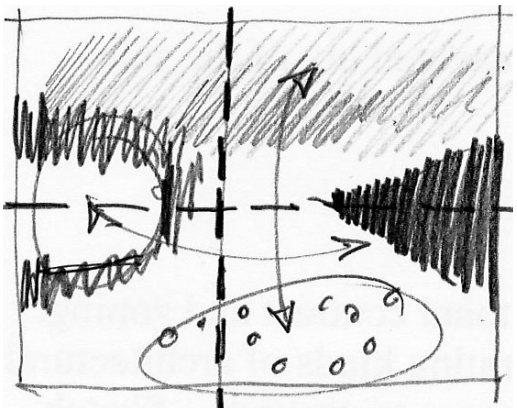


Fig. 109: Diagram showing how areas of opositie tone and texture are contrasted across horizontal and vertical centrelines to achieve a composition which is graphically balanced but asymmetric. (SH)

Fig. 110: Sketch of the southwest facade of the Acropolis, p.123 (LC, Voyage d'Orient, Carnet 3).

Sketch 125 is the last completed sketch of the Acropolis in the Carnet. It sums up the final state of most of the ideas developed in the preceding ten sketches and therefore shows how much Le Corbusier's ideas of place, architecture and movement had evolved through sketching. The composition balances contrasting halves relating the far distance to the foreground architecture through overlapping planes of depth, leads the viewers eye through the space through positioning the viewpoint within the picture space and showing the actual path leading diagonally across the page.

Fig. 111: Sketch of the Propylaea eastern facade, p.125 (LC, Voyage d'Orient, Carnet 3).

This increase in sophistication is demonstrated by redrawing sketch 125 but applying the same approach to depth, landscape and central focal point in the centre of the image as used in sketch 111. Comparing this modified sketch to the original shows how the asymmetrical balance of contrasting halves in the original dramatises the composition putting the distant horizon and the building into a more intense dialogue. By centralising the Propylaea and extending the landscape across to the right, the portico becomes the sole focus of attention and the horizon a secondary element, a rather unimportant backdrop. Instead, in the original the distant horizon creates a balanced but contrasting dialogue with the porticoed facade, an equilibrium between foreground and distance, solid and void, vertical and horizontal.

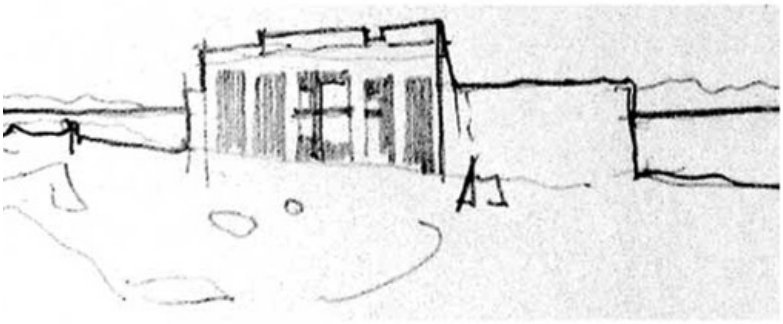


Fig. 112: Sketch 125 redrawn with an alternative composition with the Propylaea in centre of the sketch. (SH)

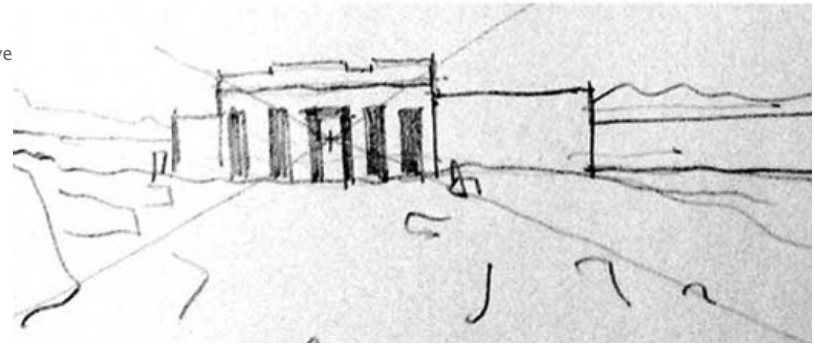
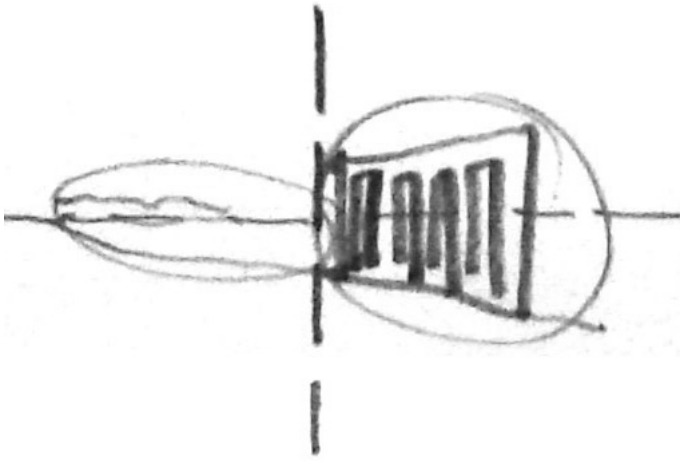
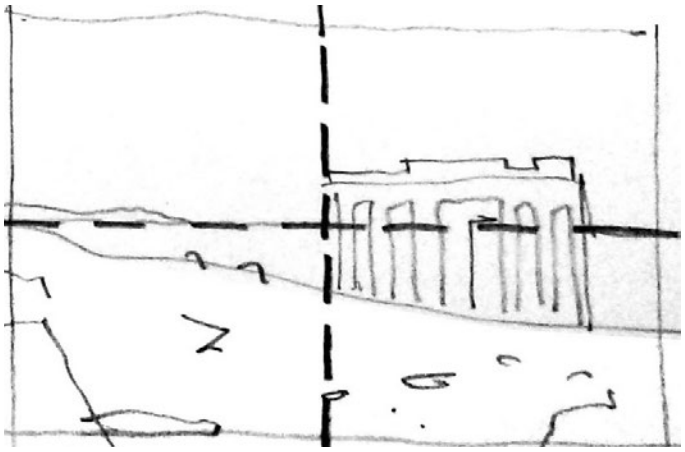


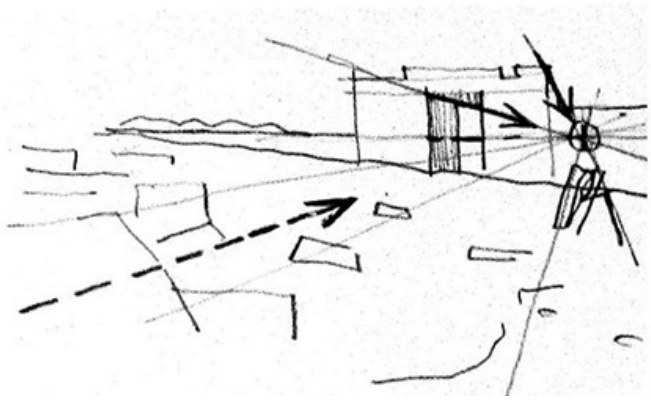
Fig. 113: Sketch 125 redrawn with an alternative frontal composition. (SH)

The second modified sketch applies the symmetrical composition and central viewpoint of 107 of the opposite facade of the same building. By comparison, in the original the diagonal orientation of the portico also helps to lead the eye across the foreground space, tracing the actual path across the plateau and through the portico out towards the distance framed between columns. The importance Le Corbusier attached to this particular view is interesting as it looks out of the entrance gate, effectively at the rear facade of the Propylaea. This is unusual as, like Choisy (1899), most analysis of the Propylaea focuses on the approach and entrance to the Acropolis from the lower level. However recent research has suggested that the Propylaea may in fact have been more significant as an exit gateway, leading out from the Parthenon and Acropolis facing across the city to the Piraeus beyond. In this respect Le Corbusier's sketch appears particularly original for choosing to focus on an aspect of the Propylaea whose importance is clearly apparent when seen in-situ, but seems to have gone relatively unappreciated in the architectural literature which he would have been familiar with. This provides another example of how his conception of the Acropolis developed through the experimental and critical process of observing and drawing from direct first hand experience, achieving conclusions which he would not have reached without sketching in-situ.

Fig. 114: Composition diagrams of sketch 125 showing the balance of foreground and distance across a central axis; The organisation of the graphic composition according to central horizontal and vertical regulating lines; The combination of vanishing point located at the extreme right of the sketch, together with continuous foreground leads the eye from the position of the sketcher, diagonally across the drawing through the Propylaea to the distant horizon. (SH)







Results

This discussion demonstrates that Le Corbusier used his sketches as a structured method for his own personal investigation of the Acropolis and not just to illustrate preformed or borrowed concepts. The analysis shows that the Carnet sketches not only trace the path of discovery, but demonstrate how Le Corbusier was consciously using them to path-find his conceptual way by means of trial and refinement. The sequential and systematic evolution of Le Corbusier's ideas shows that the sketches propelled and directed his train of thought. In fact the carnet sketches show Le Corbusier proposing different ways to draw these major aspects of the architecture, focusing on uncovering the principle questions underlying major features of the architecture, rather than purely illustrating the architectural solutions already stated by others. This process followed an intentional order but allowed him sufficient freedom to develop original interpretations of the Acropolis. These start from the distance, then approach and enter the Propylaea before finally completing the most representative and classic views from inside and outside the Acropolis. This process of repeatedly sketching assisted him in transforming his prior knowledge of the Acropolis based on the theories of others into his own original interpretation of the architecture. More than just a record of what he discovered, these sketches reveal how he attempted to go about looking for it.

Le Corbusier used fast but expressive drawing techniques to represent fundamental architectural relationships and to most clearly reveal the primary effects that these produced on the observer. He used the compositions of the sketches and a variety of graphic techniques to emphasise his particular interests whilst minimising, or eliminating altogether, other aspects which were of only secondary importance to him at the time. The insistence on certain specific issues throughout the sketches, as well as the avoidance of others and the frequent poetic license in the representation of many views, show that these sketches were highly intentional interpretations of the Acropolis. The analysis finds that these interpretations became increasingly sophisticated as the sketches progressed and shows that he deliberately used his sketching as an active method to learn about the Acropolis.

This investigation shows that Le Corbusier used sketching to actively investigate and learn rather than just to memorise what he saw. In fact various themes crucial to his later work are not only illustrated, but were actively developed in-situ through us-

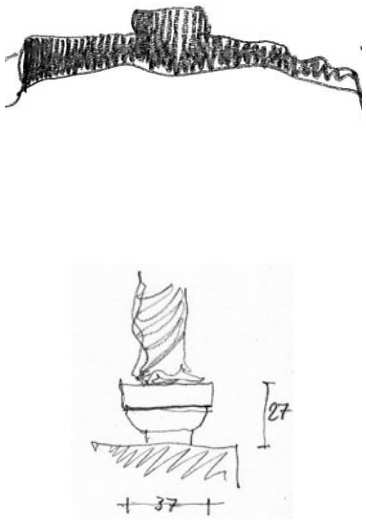
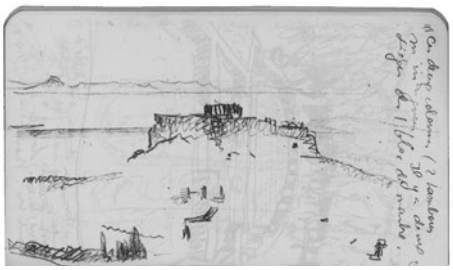
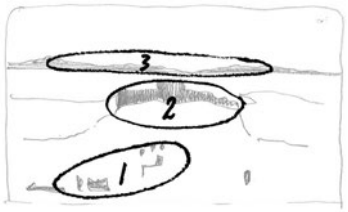


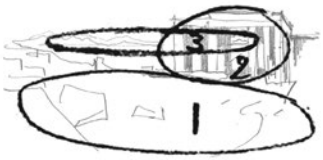
Fig. 115: Degree of integration between temple and ground. p.98 (top); Degree of separation between statue and ground. p.119 (middle); Combination of both strategies in the South west facade of the Acropolis p.123 (bottom) (SH).

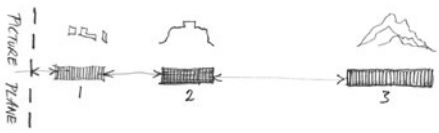
ing his sketches to experiment with and refine his analysis. Combining his prior knowledge with direct observation, the process of sketching on location helped to transform his thoughts into original interpretations of the essence of classical architecture and discover its new relevance to twentieth century architecture. This leads to a number of conclusions regarding the focus of his thoughts when on location which extend, and in certain respects contrast with, the prevailing views about the influence of the Acropolis on his later work.

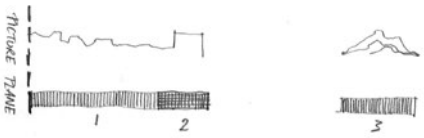
The analysis finds that variations in the way Le Corbusier represented important relationships between architectural elements and their surroundings reflect a continuous process of experimentation through which he refined his conceptions of the Acropolis and its temples. Whilst these were sometimes inspired by his prior knowledge, the ideas underlying the sketches always took a course of their own developing along unexpected conceptual paths through trial and error and continual revision. Although Le Corbusier's ideas about the Acropolis continued to evolve significantly during the years after his visit, several patterns emerge in the carnet sketches showing his ideas at the time were converging towards certain clear architectural concepts regarding the relationship of architecture and ground, and the representation of movement and spatial sequence. But it finds that a number of Le Corbusier's later theories were absent from his thoughts. This suggests that many of the ideas stated in his later texts were either not at all clear to him whilst on location, or were simply not present amongst his concerns at the time when confronted by the physical presence of the Acropolis. The promenade architecturale (the observer's pathway through the built space) does not follow as directly from Choisy as Le Corbusier's later writings may suggest. It shows an appreciation of distinct, immersive spatial environments arranged in order, but not a stipulated path connecting a set of fulcrum viewpoints in the manner of Choisy. This article separates his actual discoveries in-situ from his prior knowledge and ideas he appropriated from others, from later influences and from his retrospective thoughts, and traces the course of his original in-situ analysis of the Acropolis.

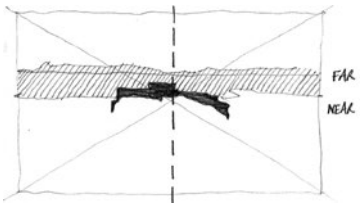


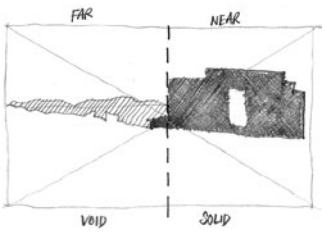

3
2
1

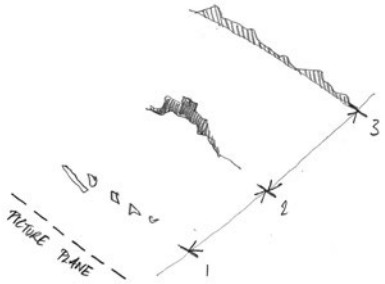

3
2
1


PICTURE PLANE
1
2
3


PICTURE PLANE
1
2
3


FAR
NEAR


FAR
NEAR
VOID
SOLID


3
2
1
PICTURE PLANE

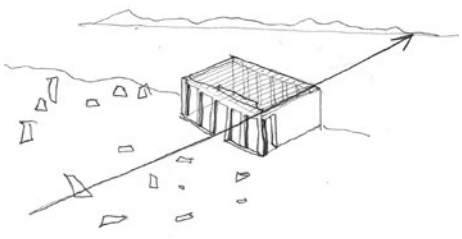


Fig. 116: Acropolis from Mount Lycabettus p.98 (left); Propylaea eastern facade, p.125 (right) (LC, Voyage d'Orient, Carnet 3).

Conclusions

A comparison of the first and last completed sketches of the Acropolis in the carnet demonstrate the conceptual transition which occurred in his in-situ drawings during his two week visit. Despite one being drawn from the distance and other from the Acropolis itself, both sketches 98 and 125 share many essential characteristics. Both face to the South west, and include porticoed temples in the centre-ground, with sea and mountains on the distant horizon and isolated irregular elements making up the foreground. The differences however concentrate the viewer's attention in p.98 on the picturesque description of the Acropolis and in p.125 on inviting the gaze to trace across a dynamic and continuous space, through the threshold of the Propylaea and out to the distant horizon. The comparison of these two drawings serves to summarise the main arguments so far.

Fig. 117: Depth of Field analysis p.98 (left); p.125 (right) (SH).

Le Corbusier used his sketches in the carnet as a structured process partly for uncovering and partly for creating his own personal interpretation of the Acropolis. This chapter demonstrates that Le Corbusier used his sketches as a structured method for his own personal investigation of the Acropolis and not just to illustrate preformed or borrowed concepts. The Carnet sketches not only trace the path of discovery, but show how Le Corbusier was consciously using them to path-find his conceptual way by means of trial and refinement. The sequential and systematic evolution of Le Corbusier's ideas shows that the sketches propelled and directed his train of thought. I find that the carnet sketches show a propositional approach to analysis focused on uncovering the principle questions underlying major features of the architecture, rather than purely recording a set of architectural solutions already stated by others. This method followed an intentional order but allowed him sufficient freedom to develop original interpretations of the Acropolis. This assisted him in transforming his prior knowledge of the Acropolis based on the theories of others into his own original interpretation. More than just a record of what he discovered, these sketches reveal how he attempted to go about looking for it.

Fig. 118: Separatin between picture plane and receding planes within the drawing p.98 (left); p.125 (right) (SH).

Fig. 119: Composition comparison showing near and far elements p.98 (left); p.125 (right) (SH).

In contrast to his writings, the themes he explored which stand out most in his sketches were ground and movement. In-situ, Le Corbusier's attention focused on the interface between ground architecture and horizon. This developed significantly during the course of the sketches and diverged into two alternative ideas, one of using steps and level changes to integrate architecture

Fig. 120: Separation between picture plane (the observer's viewpoint) and consecutive spaces mposition comparison showing near and far elements p.98 (left); p.125 (right) (SH).

into the surface of the ground and another of using platforms and steps to separate and distinguish the architecture from the ground. The Carnet 3 shows that his appreciation of these relationships became broader and more complex during the course of the sketches rather than converging on one single concept. The sequence shows that Le Corbusier's compositions developed from static picturesque depictions of the Acropolis to carefully constructed images which emphasised the dynamic experience of the viewer's movement through the architecture. As they proceed, the drawings convey an increasingly concentrated sense of movement through space. Diagonal viewpoints, asymmetric compositions and continuous spatial regions are all used to imply a variety of spaces related one to another and consequently implying the possibility of passage between them. The order of the views drawn in sketches 98 to 125 shows he was less interested in portraying a sequential fly-through or storyboard of the Acropolis, than in using the drawings as a means to analytically investigate the Acropolis. In contrast to many texts about Le Corbusier's visit to the Acropolis, the sketches he made on location however make little mention of a number of issues which are considered by many authors to have been of central importance during Le Corbusier's revelatory first visit. This suggests that during his visit in 1911, Le Corbusier gave less importance to a number of his most celebrated ideas than is often assumed. Some of these, such as mathematical systems of proportion, material precision and "the plastic system brought together in light" developed only after his visit, with significant influence from other sources but were not immediately inspired by his in-situ experience of the Acropolis in person. Nevertheless, other ideas, such as the promenade architecturale, were formulated in-situ through gradual trial and revision in his sketches.

Sketching in-situ can achieve far more than simply describing particular characteristics of a building. The gradual construction of a sketch and its subsequent improvement over the course of following sketches develops a considered analytical opinion about the subject matter. The sketchers's conceptual image of architecture and place is transformed and refined through sketching by the sequence of proposals and refinements which make up the design process. Le Corbusier used fast but expressive drawing techniques to represent fundamental architectural relationships and to most clearly reveal the primary effects that these produced on the observer. He used the compositions of the sketches and a variety of graphic techniques to emphasise his particular interests whilst minimising, or eliminating altogether,

other aspects which were of only secondary importance to him at the time. The insistence on certain specific issues throughout the sketches, as well as the avoidance of others and the frequent poetic license in the representation of many views, show that these sketches were highly intentional interpretations of the Acropolis. This chapter finds that these interpretations became increasingly sophisticated as the sketches progressed and shows that he deliberately used his sketching as an active method to learn about the Acropolis. Through his repeated experiments with different ways of representing similar elements, Le Corbusier gradually developed the ideas he had already received from prior study, such as Choisy's ideas of movement, transforming them into new versions based on his own empirical experience and interpretation of place whilst on location. This use of drawing to further one's thoughts has been appreciated for a long time, Wren drew amplified anatomical illustrations well beyond the capabilities of 17th century optics in order to further his research fragmented observation and formulate an image of his own ideas (Sennett, 2008). This ability to reveal, expand, and develop a personal interpretation based upon real observation and extended with the informed, concentrated imagination is fundamental to any innovative process which depends on its context. In context where architectural production and research relies increasingly on virtual methods far removed from material processes, this presents an opportunity for empirical research and creation which is unique, accessible and increasingly relevant for current research and design.

Although inspired to great degree by the Acropolis, each sketch is in fact an individual and highly personal design project generated through the same propositional thought process Le Corbusier used in the design of his own built projects. The graphic analysis of these sketches reveals exactly how he went about finding and developing original interpretations of the most classic of architectural references. Le Corbusier's method of investigative sketching achieved particularly original results in the new interpretations which he extracted from such a well-known subject. It is also interesting to note the importance of these sketches in his later opinions, which he contrasted so directly and robustly with the dominant views about the Acropolis at the time. In order to learn from this method, and understand how it may be replicated in other circumstances and used to maximum advantage today, this research has sought to explain in precise terms how Le Corbusier used the method, where he started from, what steps he took and how he reached his decisions.

The sketches are themselves evidence of a propositional mind with prior knowledge but without fixed preconceptions. Le Corbusier worked out his opinions and ways of seeing through using exploratory sketching to actively engage with his surroundings. This set of drawings demonstrates the initial phases of ideas which were later to become some of the determining characteristics of his work. As Jacques Lucan (1987, p.20) writes, on the Acropolis, “toute a commencé là…”. The Acropolis sketches are the record of Le Corbusier’s painstaking discovery of some of his most celebrated principles.

CHAPTER 5

Unite d'Habitation, Le Corbusier

A comparison of ideas between Le Corbusier's sketches of the Acropolis and his design for the Unité d'Habitation in Marseille.

The design sketches for Ronchamp (Fig. 125) are often compared to other sketches from the Voyage d'Orient, particularly those of Hadrian's Villa at Tivoli, Italy (Fig. 124). These correspond remarkably closely in terms of form and mass. The conclusions developed in the Acropolis sketches were however of more general relevance to architecture dealing with underlying strategies for organising space in relation to place at a variety of scales, and to the perception of man in movement. Formal similarities between classical architecture and his projects occur throughout his work. Doubtless many were intentional, but many would not have been intended, arising for other reasons or simply through the interpretations of others. Of all Le Corbusier's later works, the Unité d'habitation in Marseille is known for the many connections that link it to his conception of classical architecture and

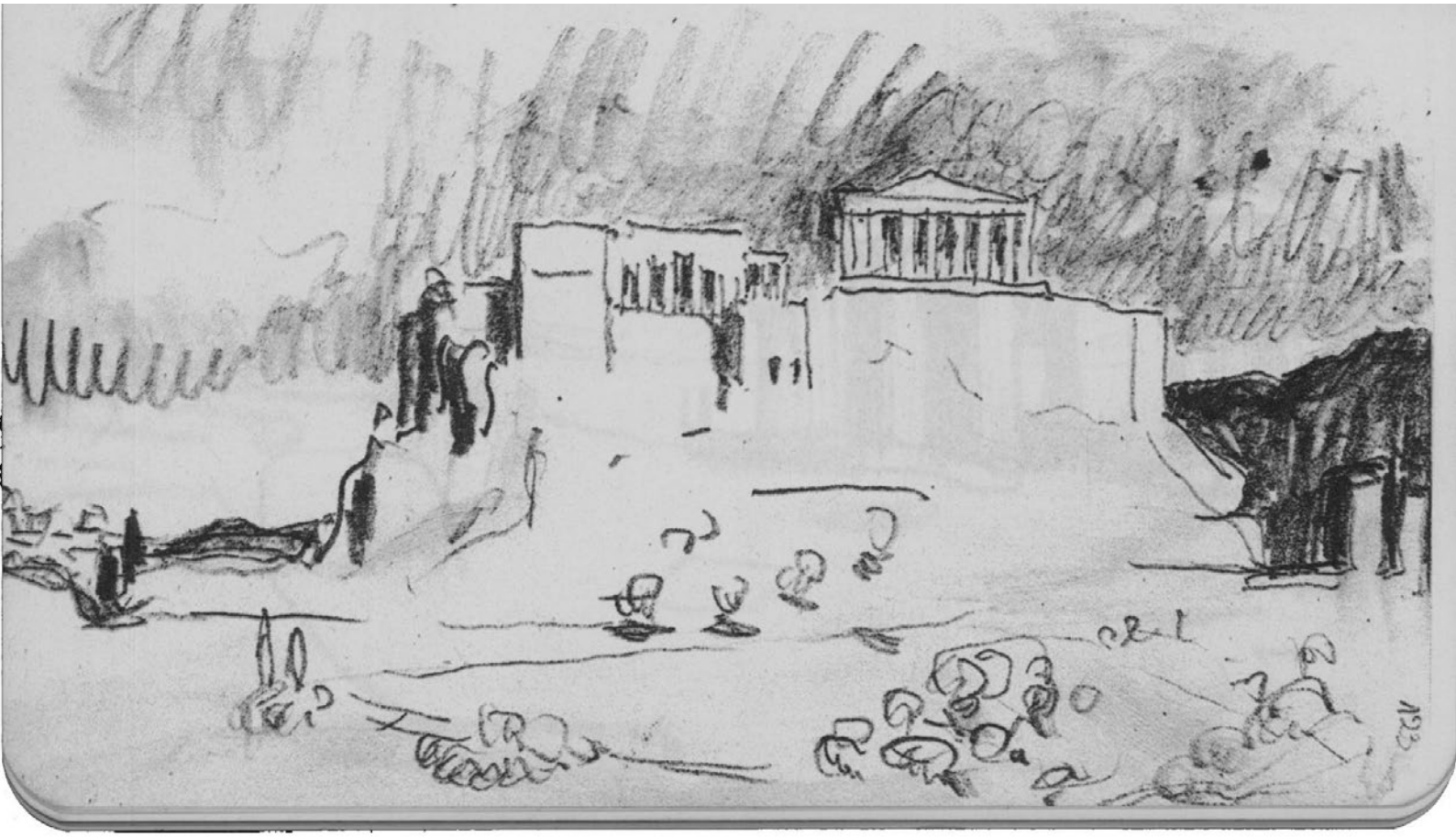


Fig. 121: Sketch of the SW facade of the Acropolis with storm clouds, p.123 (LC, Voyage d'Orient, Carnet 3).

Fig. 122: Roof of the Unité facing south east with storm clouds. (SH in-situ)

in particular the Acropolis. Many of these similarities have been pointed out in retrospect by Daza (2012), Sequeira (2009, 2015) and others (Calafell, 2000). Le Corbusier himself explained the relationship of the rooftop to the surrounding mountains and horizon in terms of his own sketches of the Acropolis. The project's inspiration in the classical world, and the Acropolis in particular, is beyond any doubt. It therefore provides an ideal example to follow on from the conclusions of the previous chapter concerning what Le Corbusier actually learnt from sketching in situ on the Acropolis. The Unité is compared directly with the original Acropolis sketches.

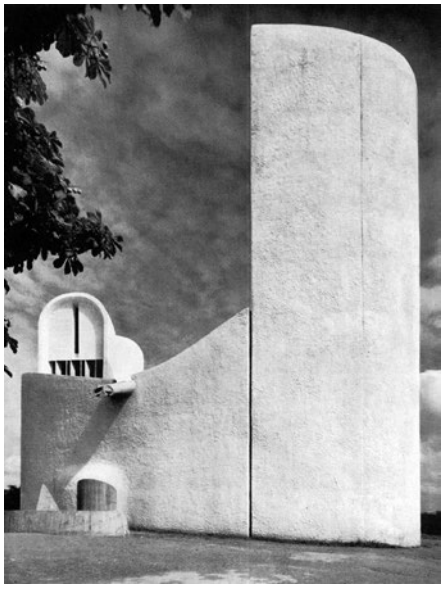
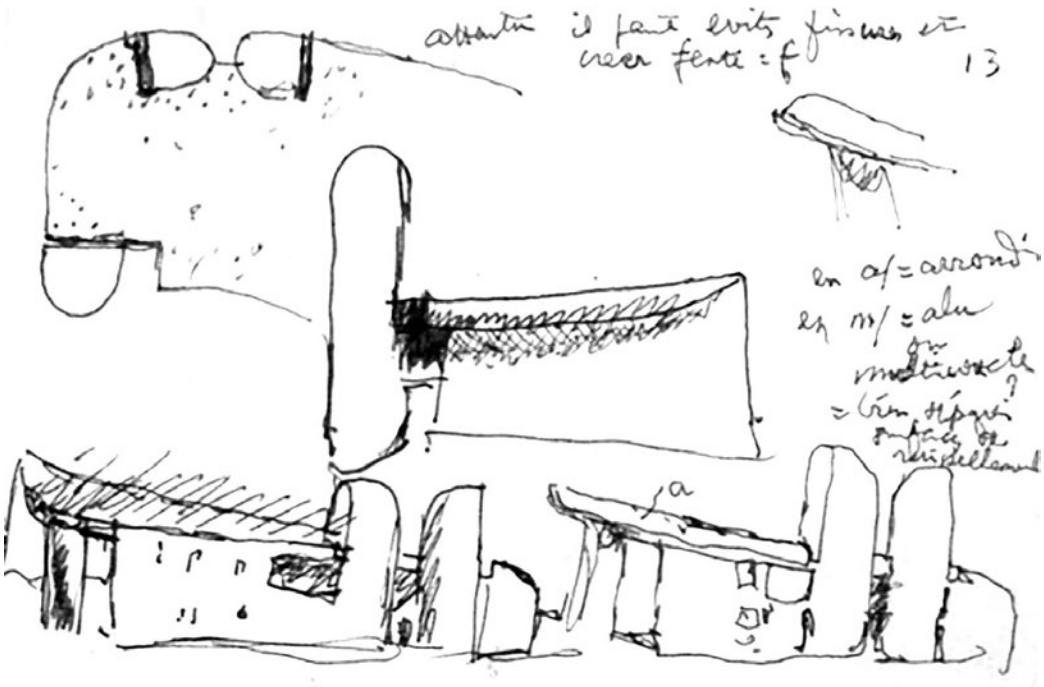


Fig. 123: Ronchamp (Le Corbusier, 1954).

Le Corbusier first sketched the Acropolis in 1911, but the Unité was not designed until after the Second World War. A distance of over 30 years separates the two. The differences between the Acropolis and the Unite and clear, nevertheless there are striking similarities as well. A multi-storey housing scheme with mixed uses built on flat ground in an urban location hundreds of miles from Athens may make the connection seem remote, but on the other hand the location has a number of parallels to that of the Acropolis - its situation set slightly back from a south west facing coast with island lying out to sea and a back drop of high hills to the other sides. Whilst there was no opportunity to copy directly from the Acropolis due to the extreme differences between the two complexes, the similarities of the place, most notably in the geography, meant that some of the architectural strategies underlying the design of the Acropolis and its buildings were in fact surprisingly appropriate to Marseille.



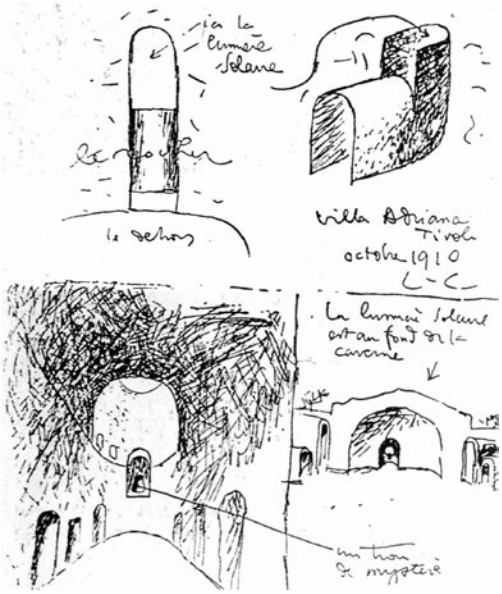


Fig. 124: Travel sketches of Hadrian's Villa (LC, Voyage d'Orient, 1911).

This chapter aims to understand if the concepts Le Corbusier discovered using his in situ sketches are also present in the built Unité. This is approached through comparing two sets of equivalent travel sketches: the carnet sketches discussed in the previous chapter, and a set of the author's sketches drawn in-situ in 2015. The reasons for this are that this allows sketches of a similar format and medium, and technique to be visually compared. But perhaps more importantly the two share a common intention which is to sketch in order to investigate a building and its relationship to its site. Both being in-situ travel sketches means that they were made under conditions which were in many ways equivalent, at least far more so than an analysis made off-site in an office or library. Whilst it is more common for Le Corbusier's sketches to be compared with concurrent photographs, this reveals a different kind of information but does not compare like with like. Josep Quetglas remarks that it is essential to find ways to compare Le Corbusier's point of view against one's own in order to better understand his reasoning[40]. Consequently although this approach has the downside of being subjective, sketches made many years later with the specific thought of Le Corbusier's Acropolis sketches as a precedent, in mind at the time of drawing. Nevertheless, for the same reasons that made Le Corbusier's travel sketches enlightening, these may still provide interesting insights into the equivalence of Le Corbusier's in-situ Acropolis sketches and the result of a design process completed over 30 years later.

Building on the set of conclusions from the previous analysis, these are cross-referenced against my own sketches of his built projects in order to see whether my own interpretation has noticed similar questions to those which interested LC on the Acropolis, or whether it has focused on other unrelated issues. The sketches of the undercroft, public third floor internal street level and roof terrace are compared against the Carnet sketches in their original chronological sequence.

The long-term influence of travel sketches on design work - Le Corbusier's sketches of the Acropolis and the Unitè d'habitation.

Why use my own sketches to decide whether Le Corbusier's original travel sketches influenced his later designs? Connections have often been drawn between his early experiences of

Fig. 125: Design sketches for Ronchamp (Le Corbusier, 1950s).

40 From a conversation with Josep Quetglas, 2015

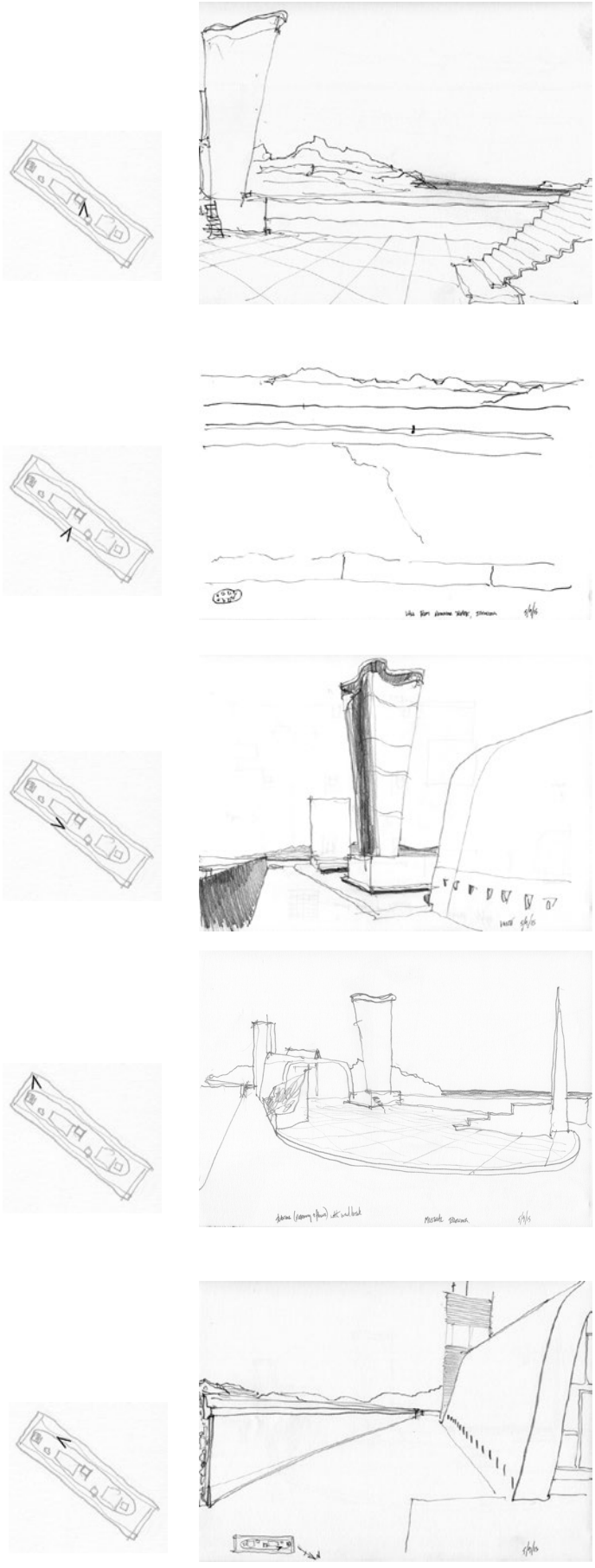
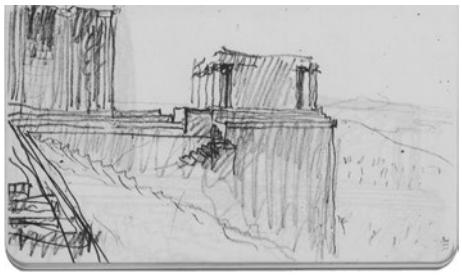
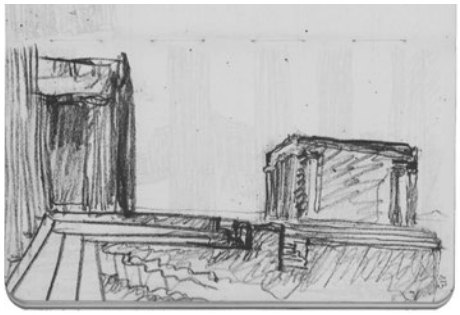


Fig. 126: Roof of the Unité, sequential sketches. (SH in-situ)





Classical architecture and his later work. Le Corbusier sometimes used his original travel sketches to justify his design ideas much later in his career. Design sketches for projects such as Ronchamp bear great similarity to his sketches of Ancient Rome drawn almost 40 years before. However, his travel sketches are usually compared to photographs of his later projects (see Daza). Redrawing Le Corbusier's buildings has the advantage of using the same medium to put the information into a similar format allowing more direct comparison. Through applying similar in-situ drawing strategies to those Le Corbusier himself used on the Acropolis, the new sketches show a selective representation of the built projects, which allow a more direct comparison with Le Corbusier's original sketches than photographs would.

Taking the main themes discussed above in regard to Le Corbusier's sketches of the Acropolis, these new sketches focus on the relationships between building and ground, on composing depth of field to juxtapose architecture with the surrounding landscape, and on showing spatial movement.

Movement

The roof terrace of the Unité comprises a number of facilities for the community along with a running track and various other elements intended for public use. The arrangement of these various concrete forms bears certain similarities with the arrangement of buildings on the Acropolis, In part this is due to their dramatic relationship with the distant horizon and mountains. However, as Le Corbusier appreciated in the Acropolis, the various forms are intended to be perceived in movement, in this case around the circuit of the running track.

The sketches on the left follow part of this circuit from the entry onto the roof, clockwise around the north western half of the track, showing the sequence of volumes and the spaces created between them. This is placed alongside Le Corbusier's own travel sketches of the entrance sequence to the Acropolis in their original chronological order.

Fig. 127: Sketches of the entrance sequence to the Acropolis, pp.109, 111, 113, 115, 125 (LC, Voyage d'Orient, Carnet 3).

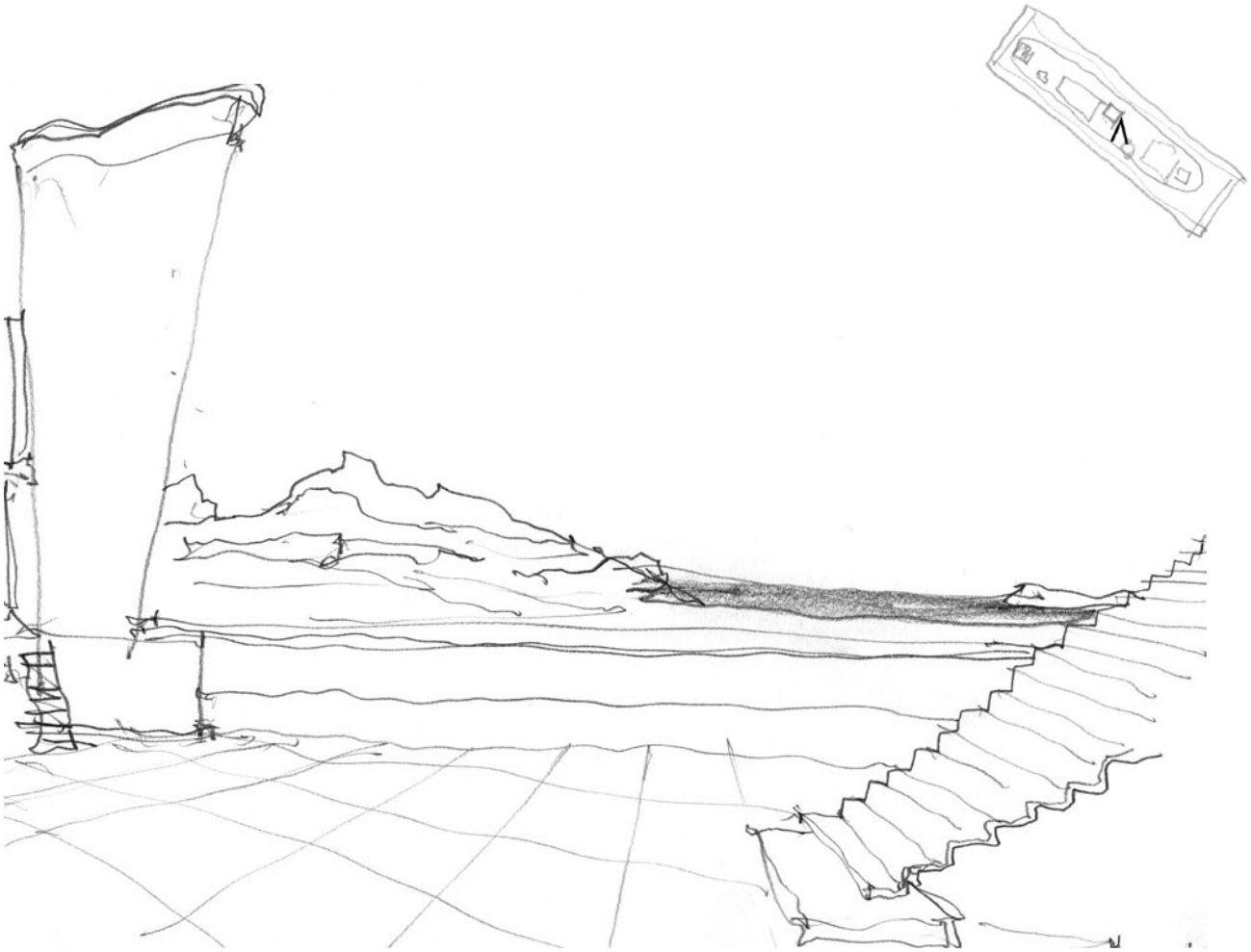


Fig. 128: Roof of the Unité, facing south at the entrance point from the stair lobby. (SH)

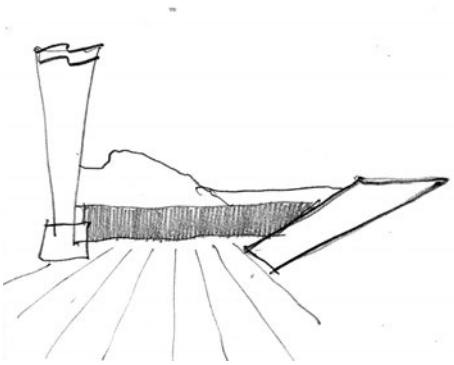


Fig. 129: Architectural composition diagrams of the in-situ sketches above. (SH)

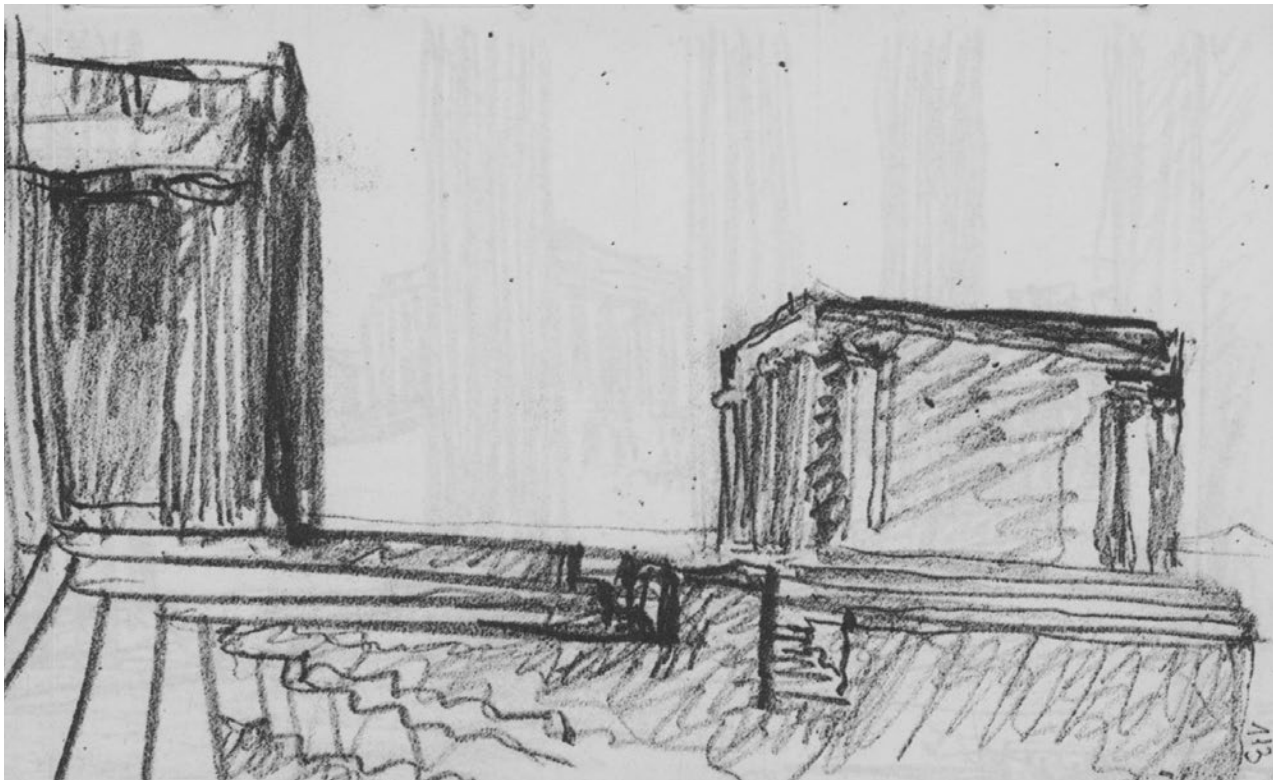
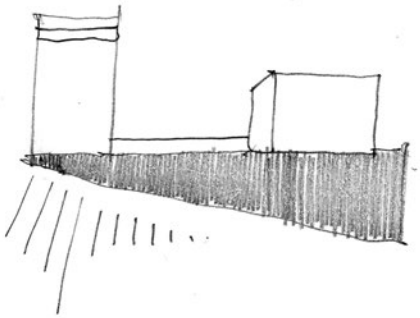


Fig. 130: Sketch of the Propylaea facade and temple of Athene Nike, p.113 (LC, Voyage d'Orient, Carnet 3).

Depth of field and volume

As Le Corbusier appreciated in the Acropolis, the relationship between architecture and place at a landscape scale could be greatly intensified through the careful juxtaposition of contrasting depths of field, and through the framing or overlapping of distant views between building volumes close by. The Unité uses the same basic elements - horizon and mountains, sculptural building volumes, blank walls and distinct paving - to achieve equivalent effects.



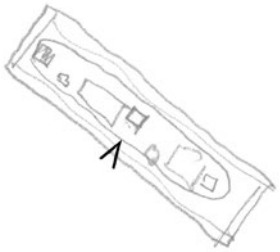
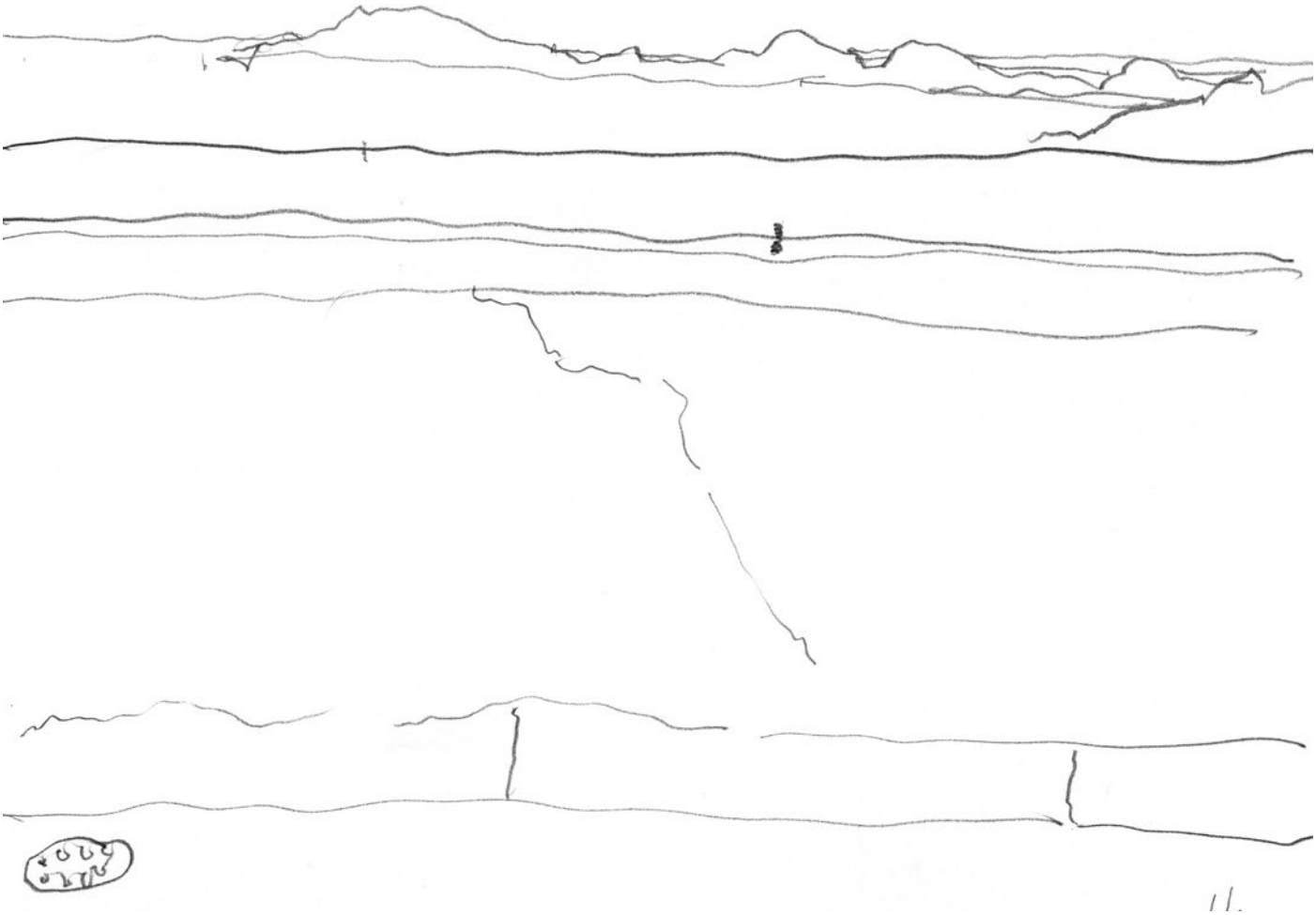


Fig. 131: Roof of the Unité. Parapet wall facing south west to the sea and islands. (SH)



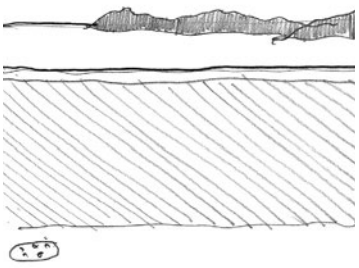
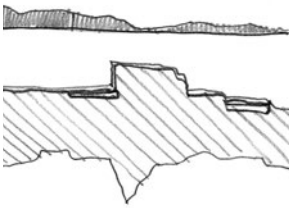


Fig. 132: Architectural composition diagrams of the in-situ sketches above. (SH)

Fig. 133: Sketch of the Acropolis, facing south west to the sea and Peleponnese, Detail of p.98 (LC, Voyage d'Orient, Carnet 3).



The high parapet wall surrounding the roof is high enough to obscure the surrounding city and concentrate the view on the contrast between immediate foreground space and the contour of the distant mountains and horizon. The continuous horizon of the parapet wall also relates directly to the parallel horizon of the sea just above it.

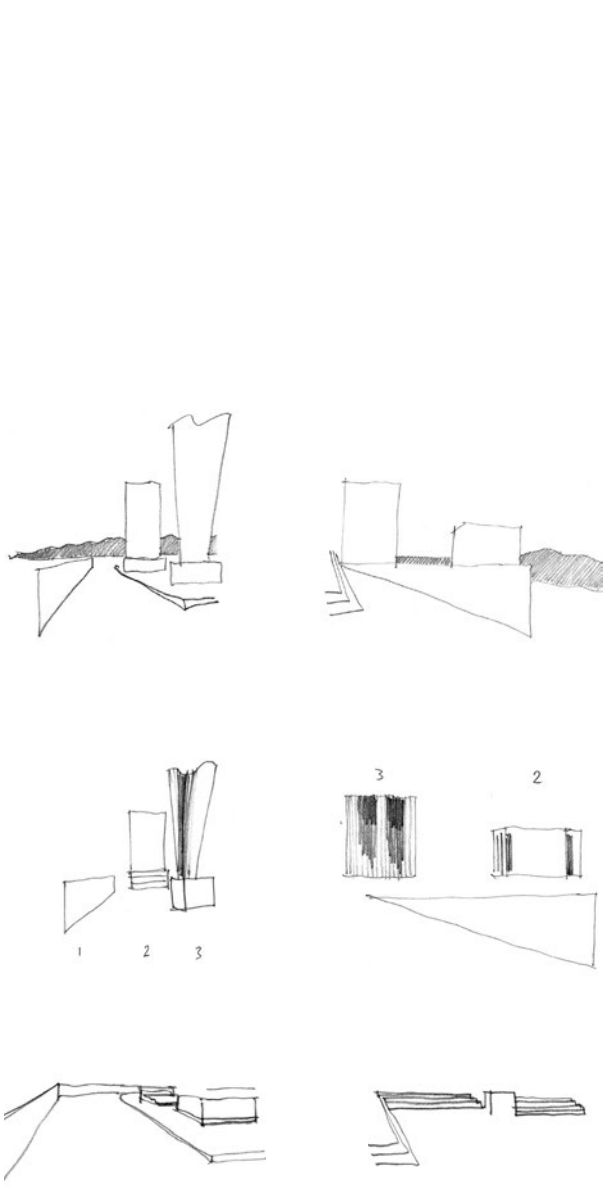


Fig. 135: Architectural composition diagrams of the in-situ sketches. TOP: Relationship of building volumes and landscape backdrop; MIDDLE: Combination of equivalent building components, flat walls and fluted coulmns in relief; BOTTOM: Bases, steps and plinths separating primary elements from the ground (SH)

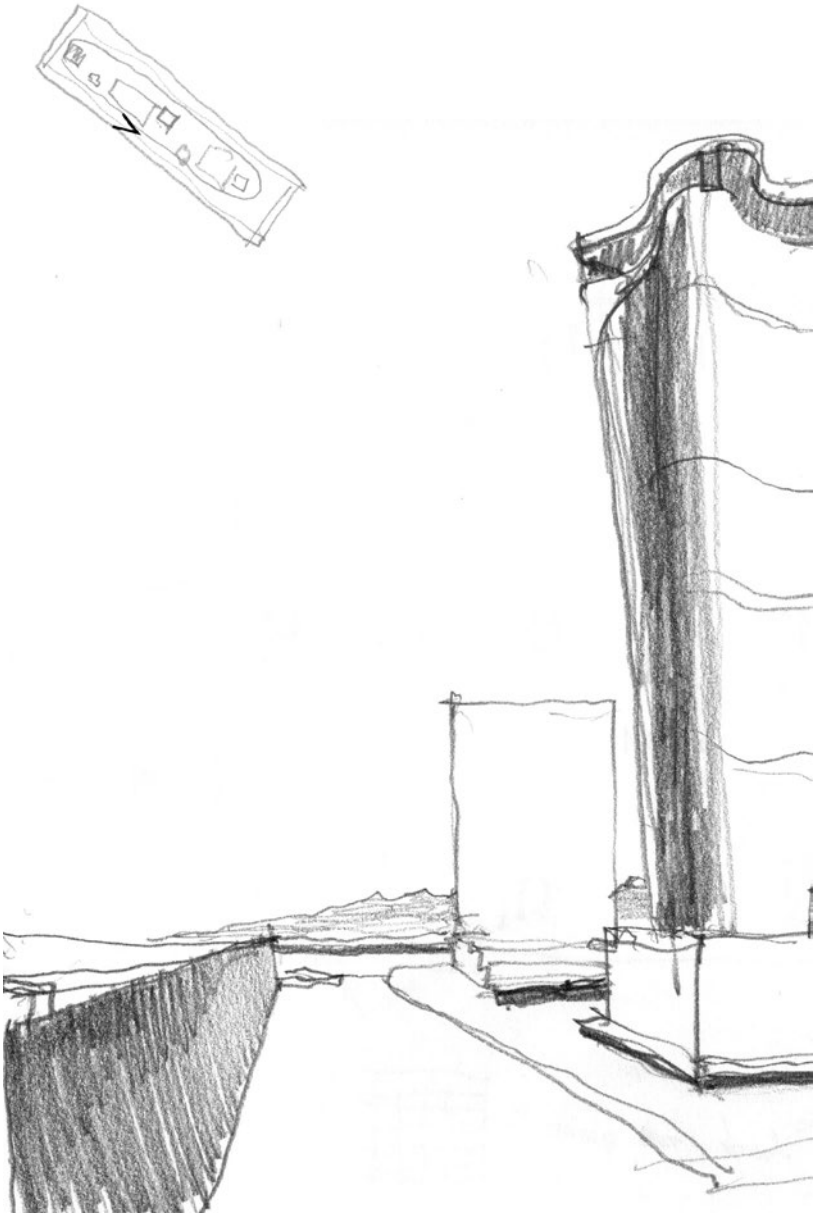
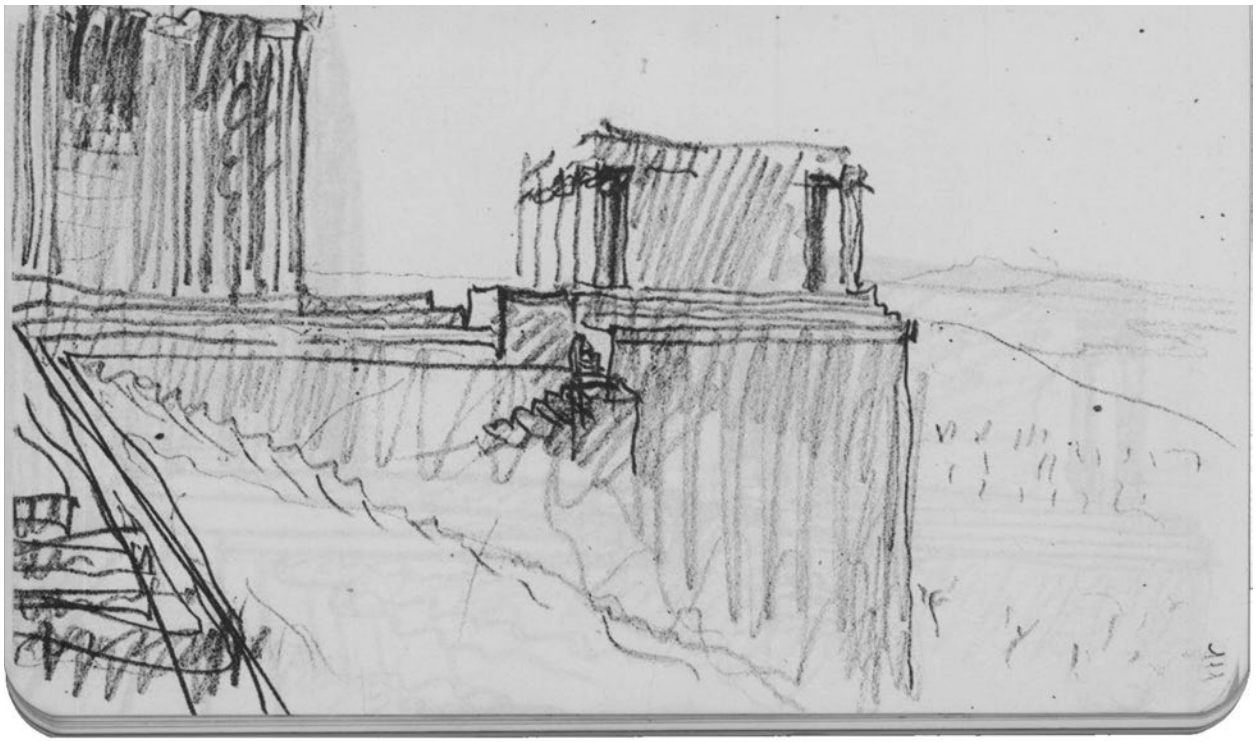


Fig. 134: Roof of the Unité. Facing NE along the southern side. (SH)

Fig. 136: Sketch of the Propylaea and temle of Athene Nike, p.111 (LC, Voyage d'Orient, Carnet 3).



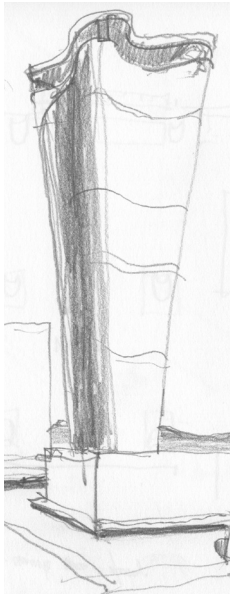
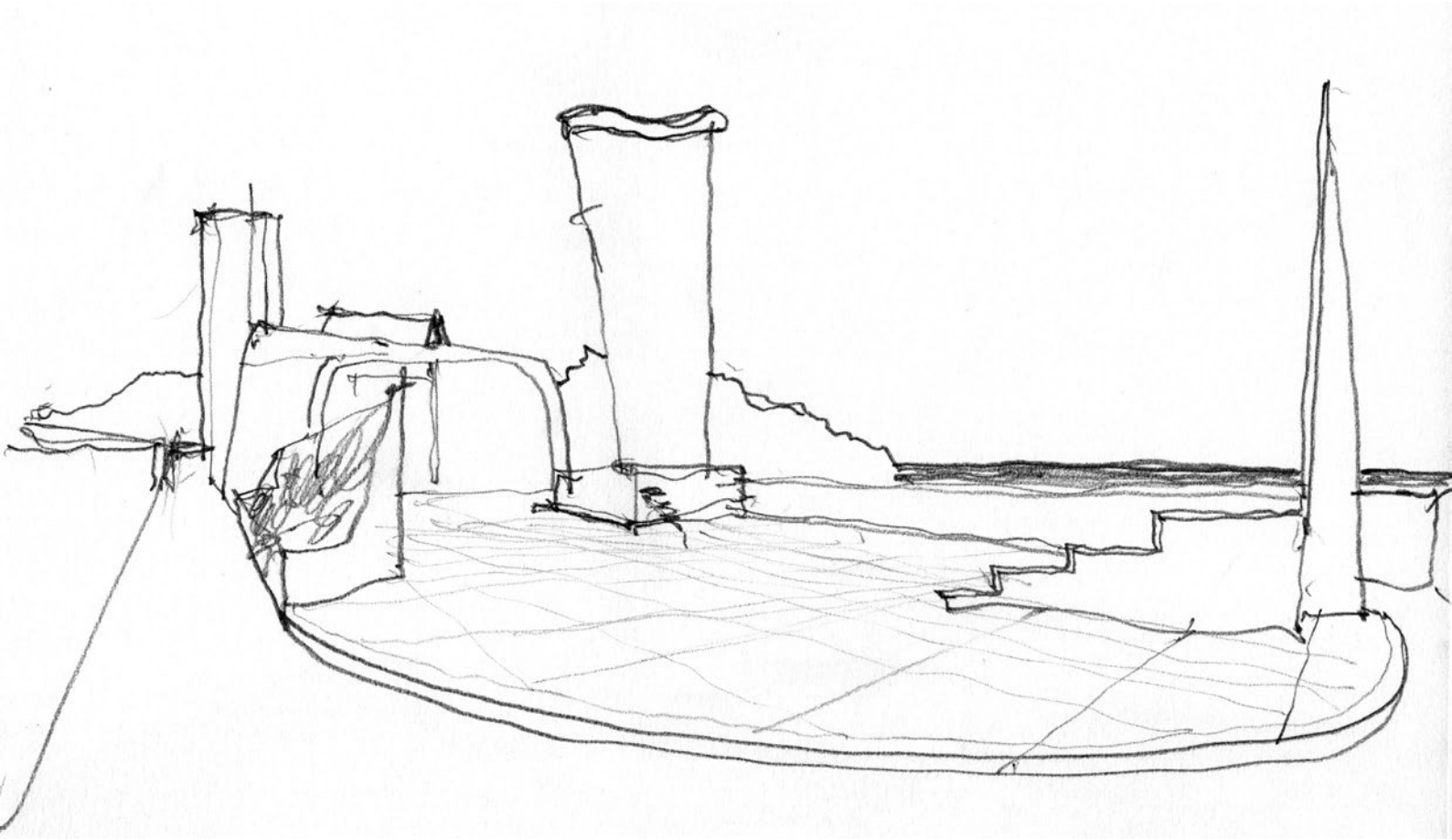


Fig. 137: Details of the in-situ sketches showing equivalent three dimensional relief of porticoes and chimneys, which is accentuated by vertical fluting and shuttering marks.



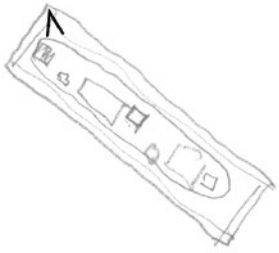


Fig. 138: Roof of the Unité. Facing south past the stage from the N corner of the running track. (SH)

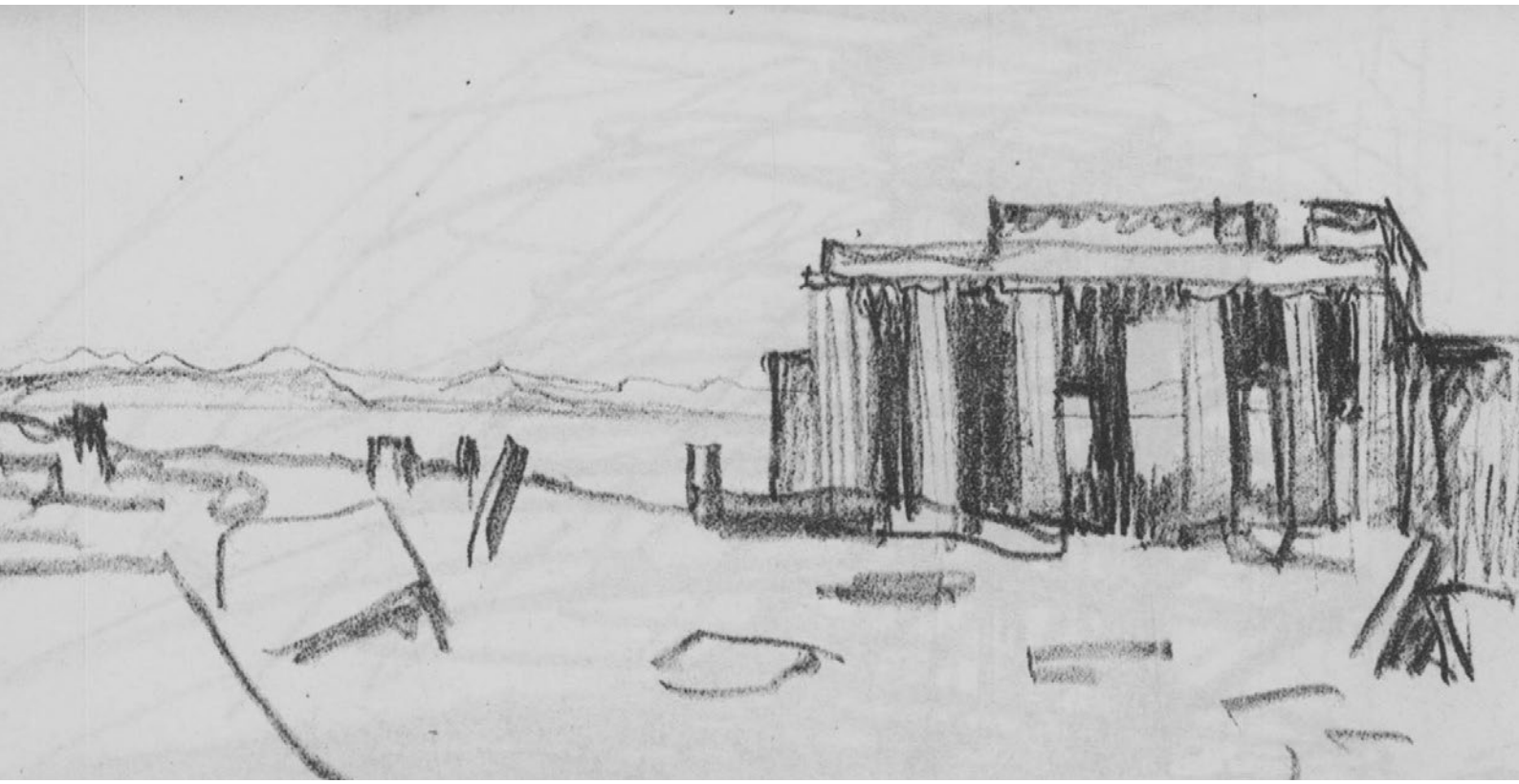


Fig. 139: Sketch of the Propylaea facing south west p.125 (LC, Voyage d'Orient, Carnet 3).

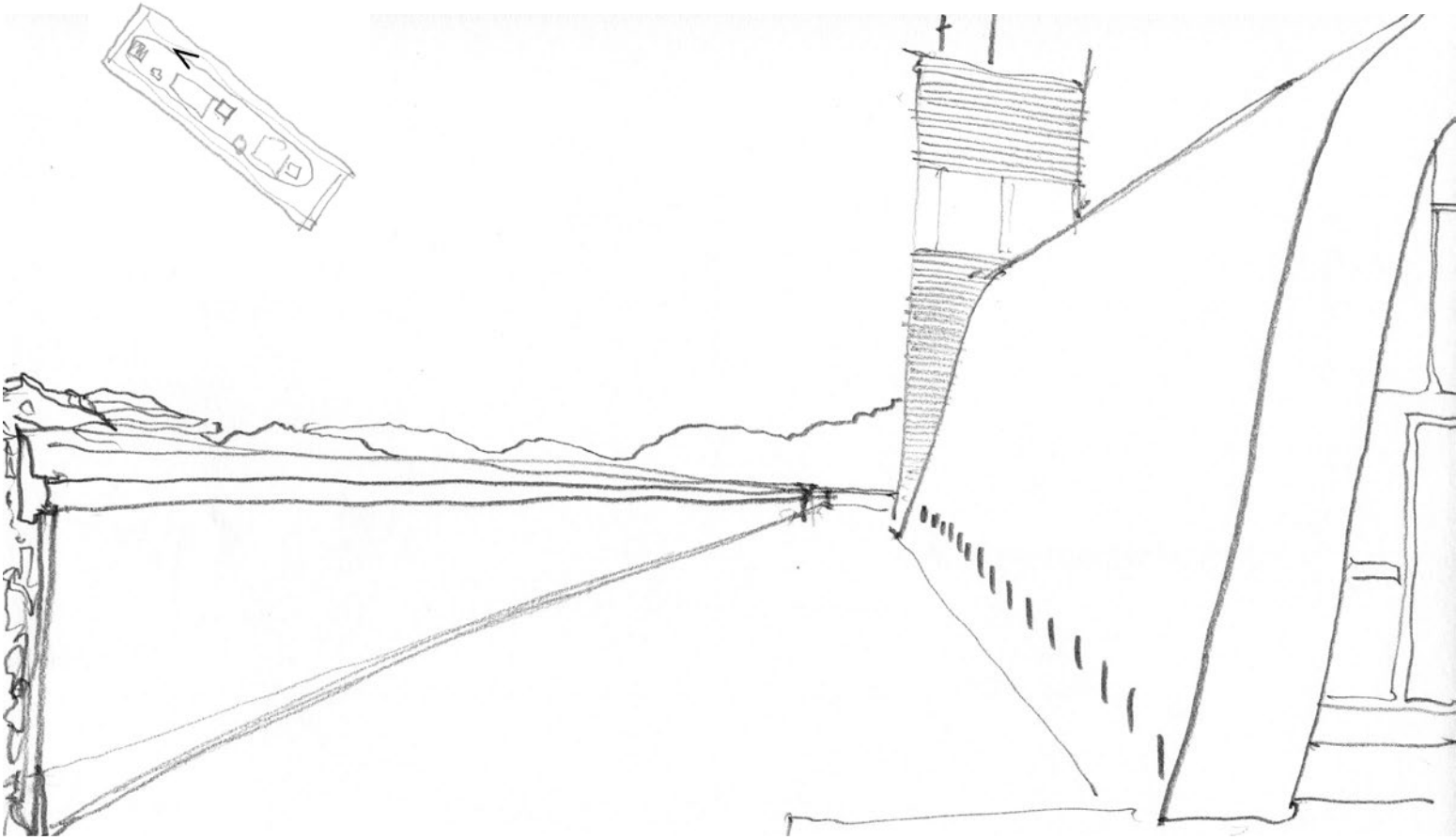
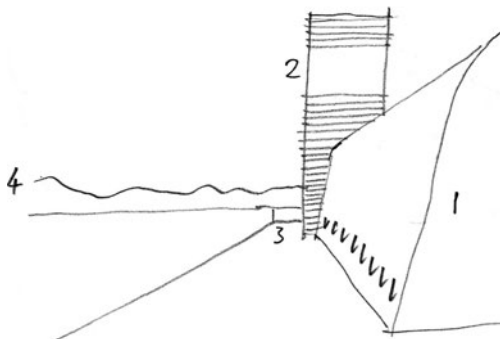
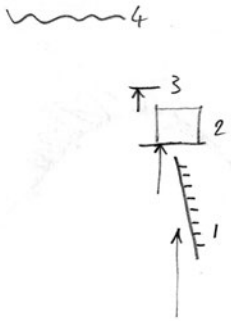


Fig. 140: Roof of the Unité. Facing southeast. (SH)





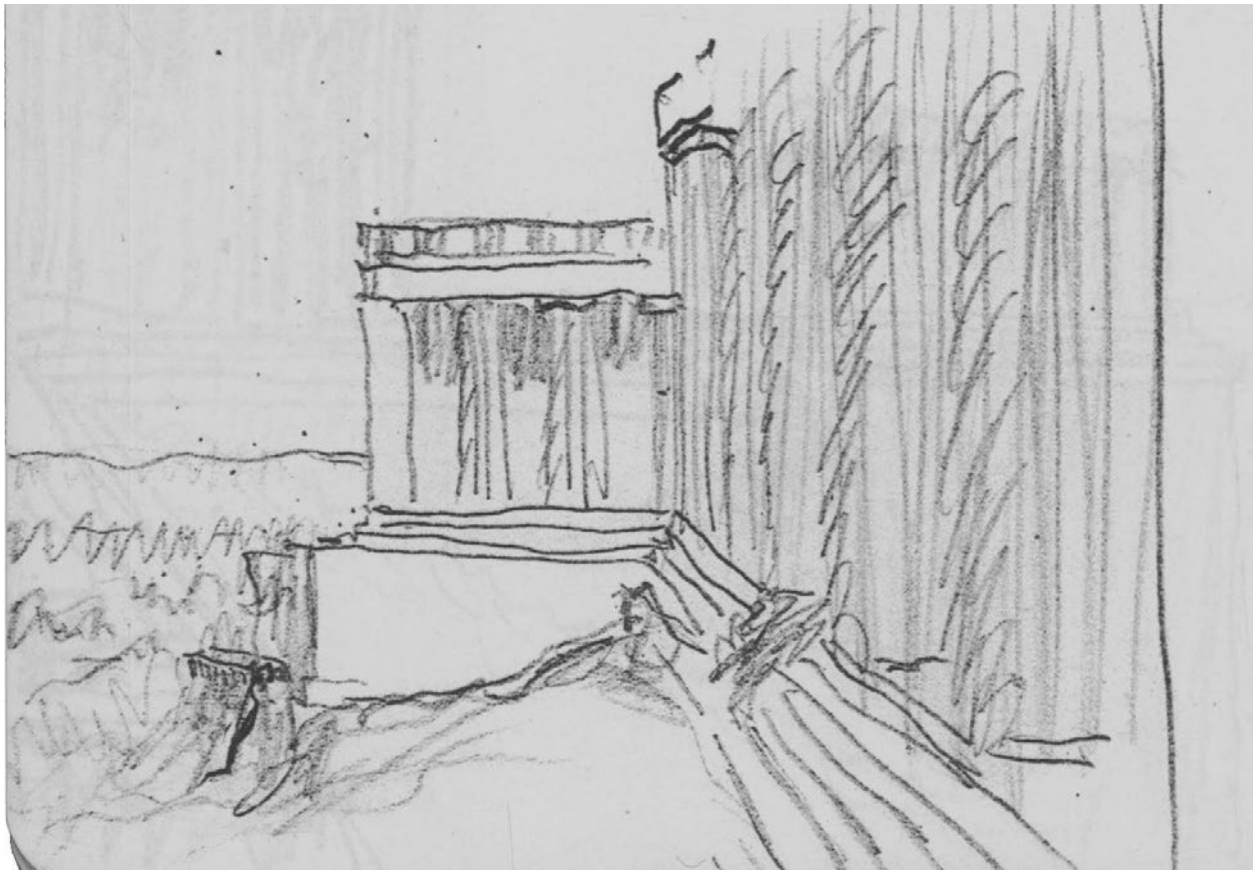


Fig. 142: Sketch of the Propylaea facing north west p.109 (LC, Voyage d'Orient, Carnet 3).

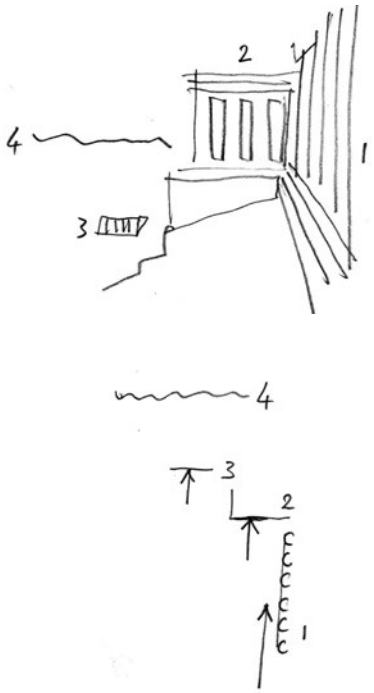


Fig. 141: Diagrams comparing equivalent elements and their arrangement in depth. (SH)

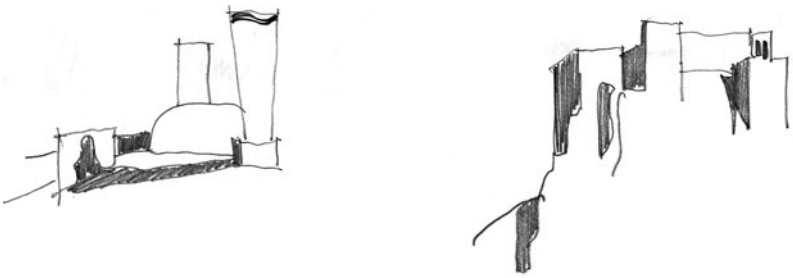


Fig. 144: LEFT: Diagrams of cast shadows in contrast to brightly illuminated surfaces. (SH)

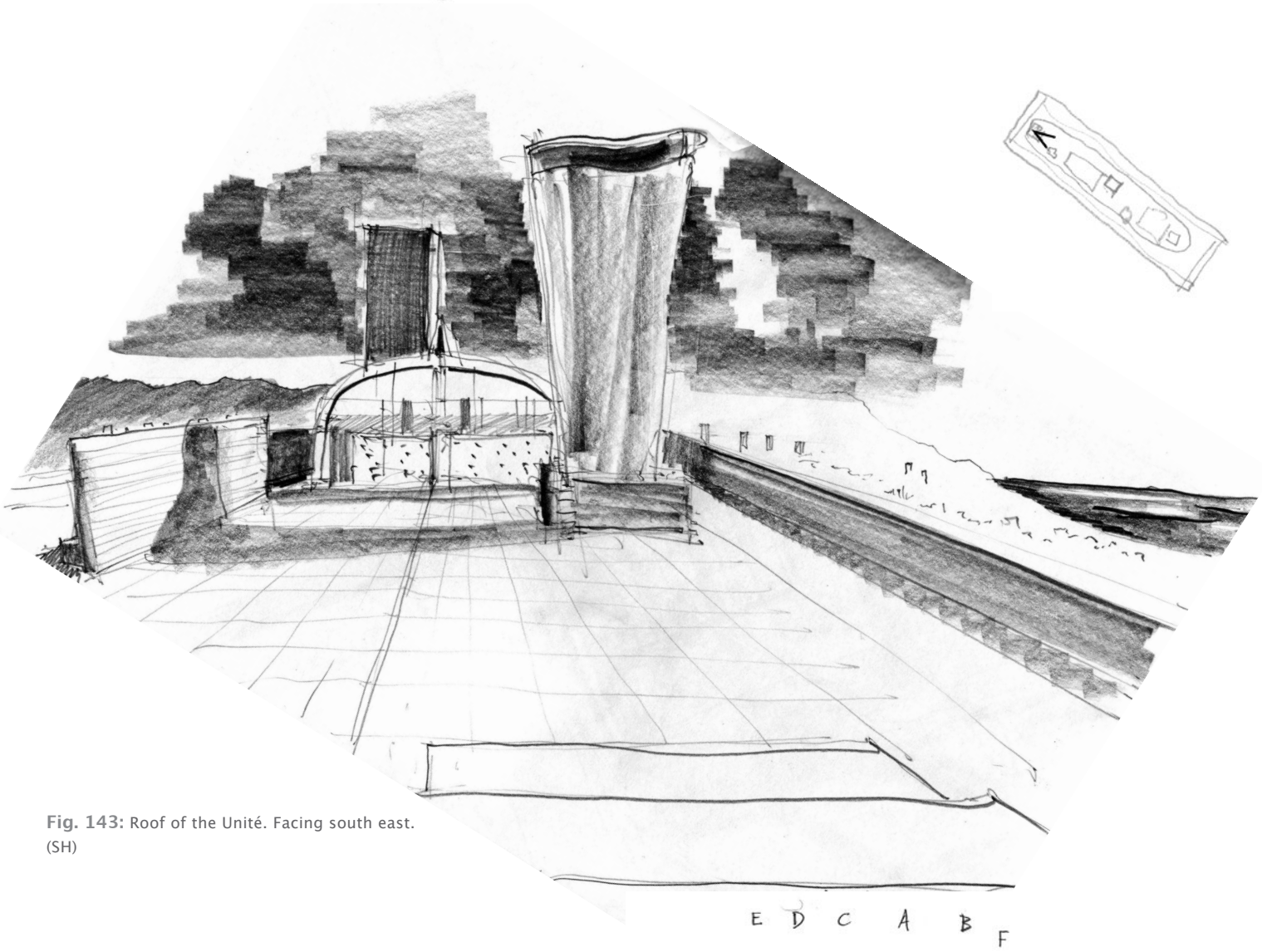
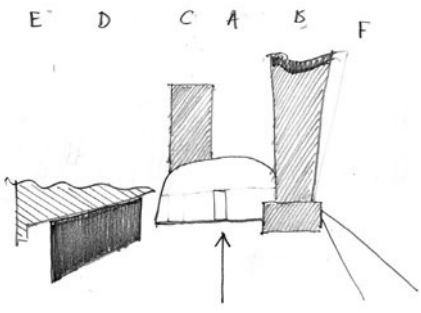
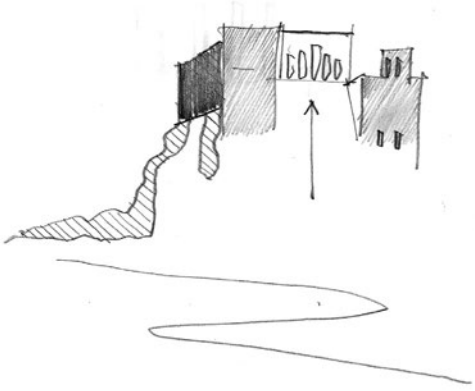


Fig. 143: Roof of the Unité. Facing south east. (SH)





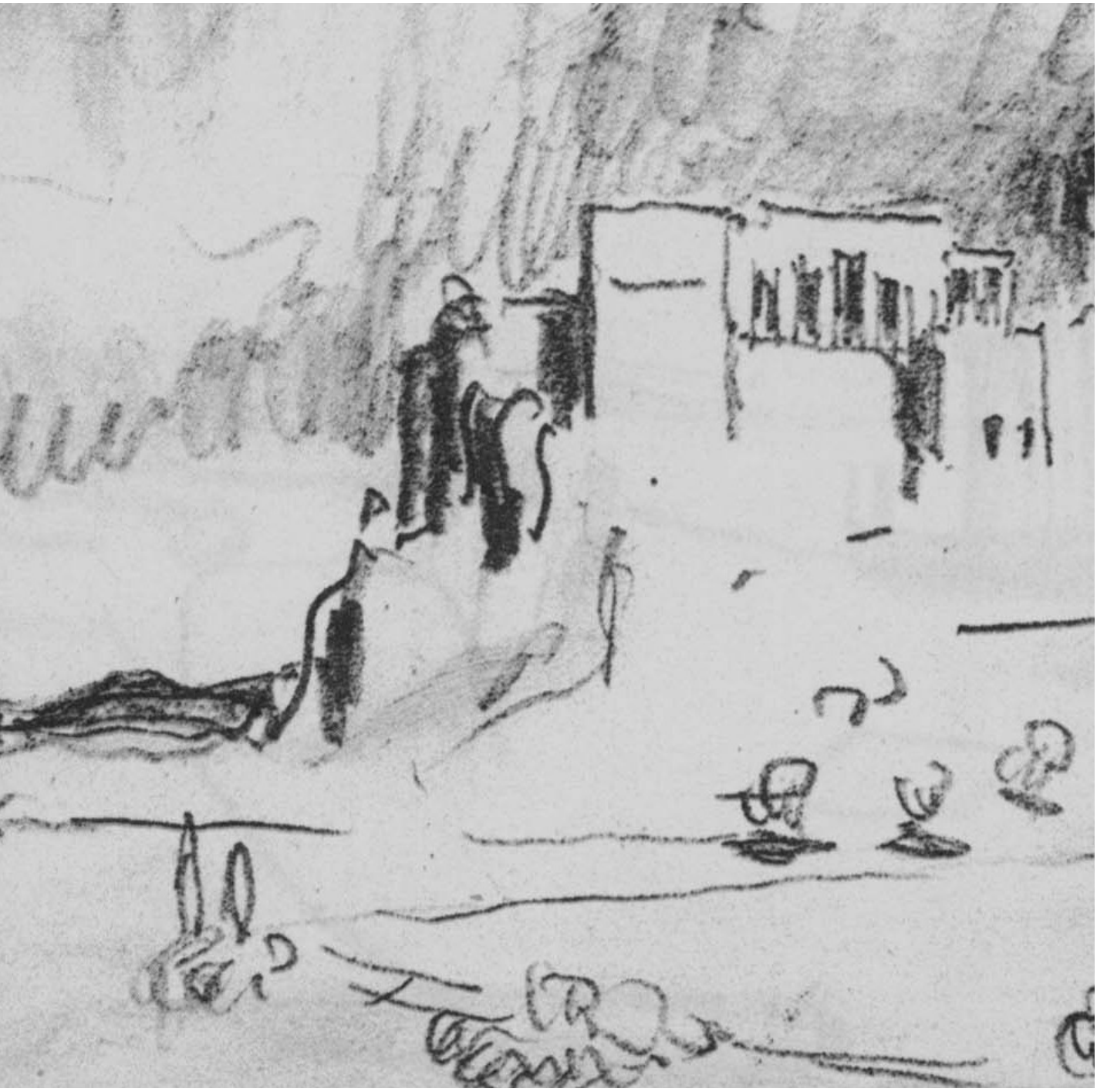
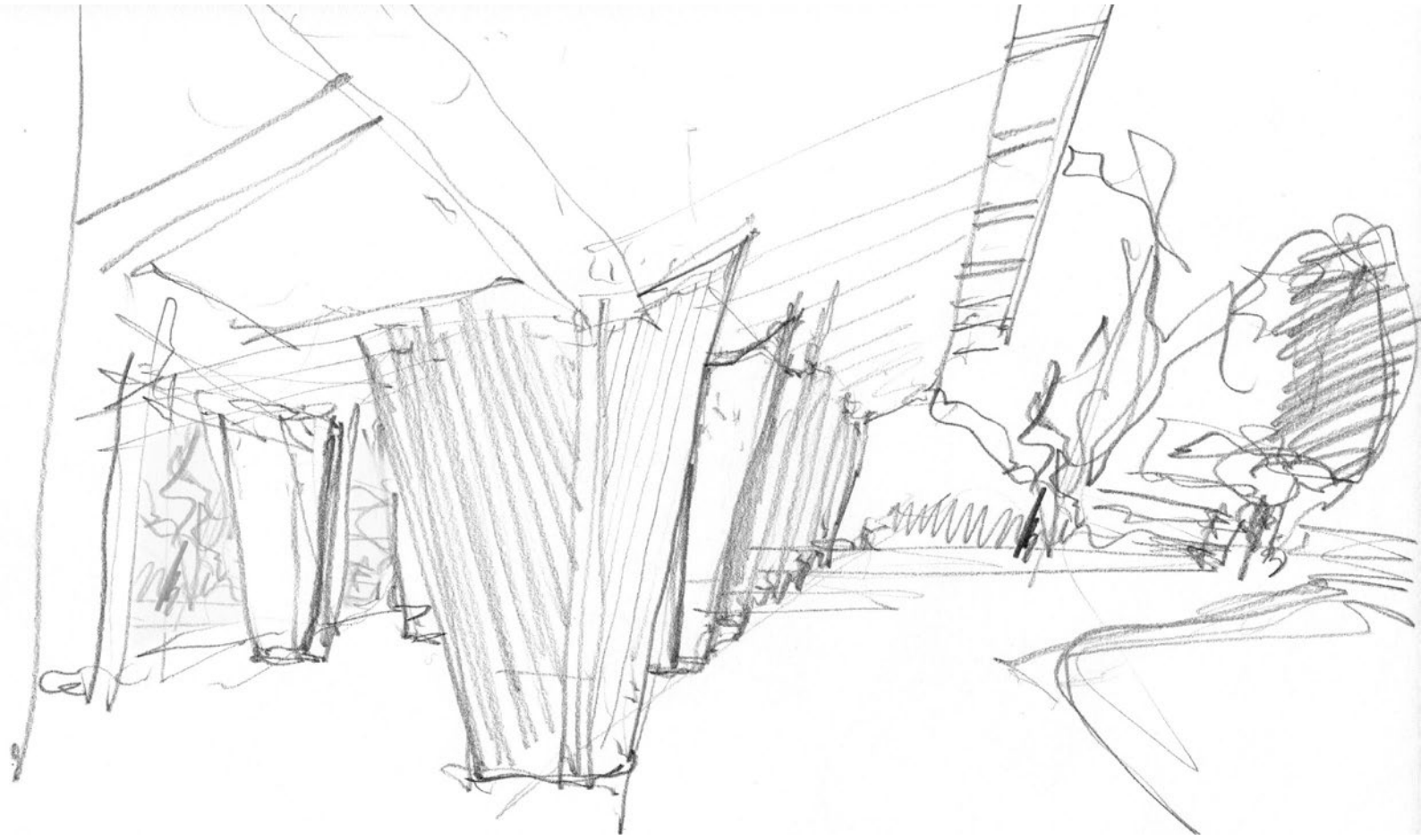


Fig. 145: Detail of Sketch of the Acropolis South west facade, p.123 (LC, Voyage d'Orient, Carnet 3).

Fig. 146: LEFT: Composition diagrams of the principle elements: central primary building with entrance (A) flanked by vertical components which are flat on the left (C) and with relief on the right (B). Blank walls (D) mark the transition between building and the curvilinear natural forms of the landscape (E). Both views show the presence of the path in the foreground, whilst the frontal viewpoint emphasises the monumentality of both compositions. (SH)

Fig. 148: LEFT: Comparative diagrams: Composition of vertical and horizontal elements (top); Positioning of a double row of columns with covered interstitial space (middle); Landscape continuing behind the building overlapping different depths (bottom). (SH)

Fig. 147: Undercroft of the Unité. (SH)



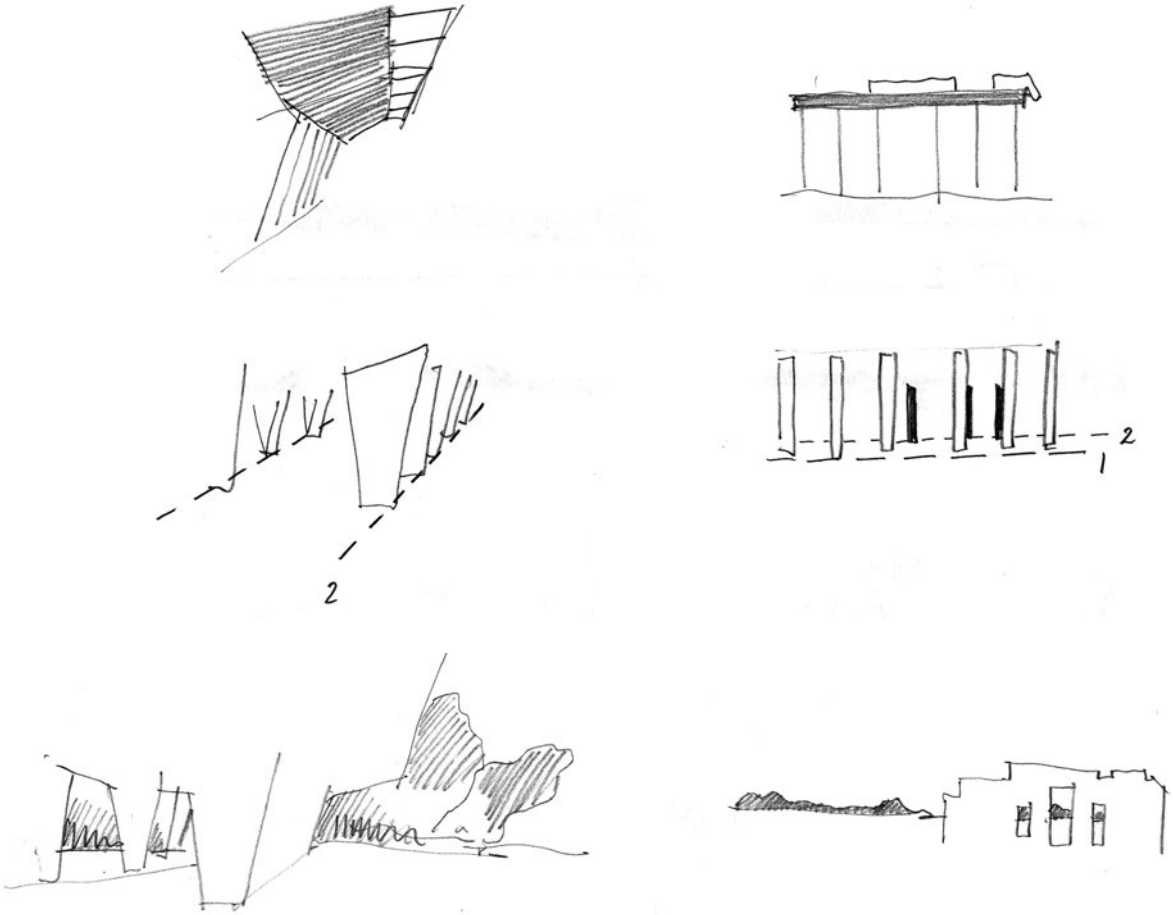
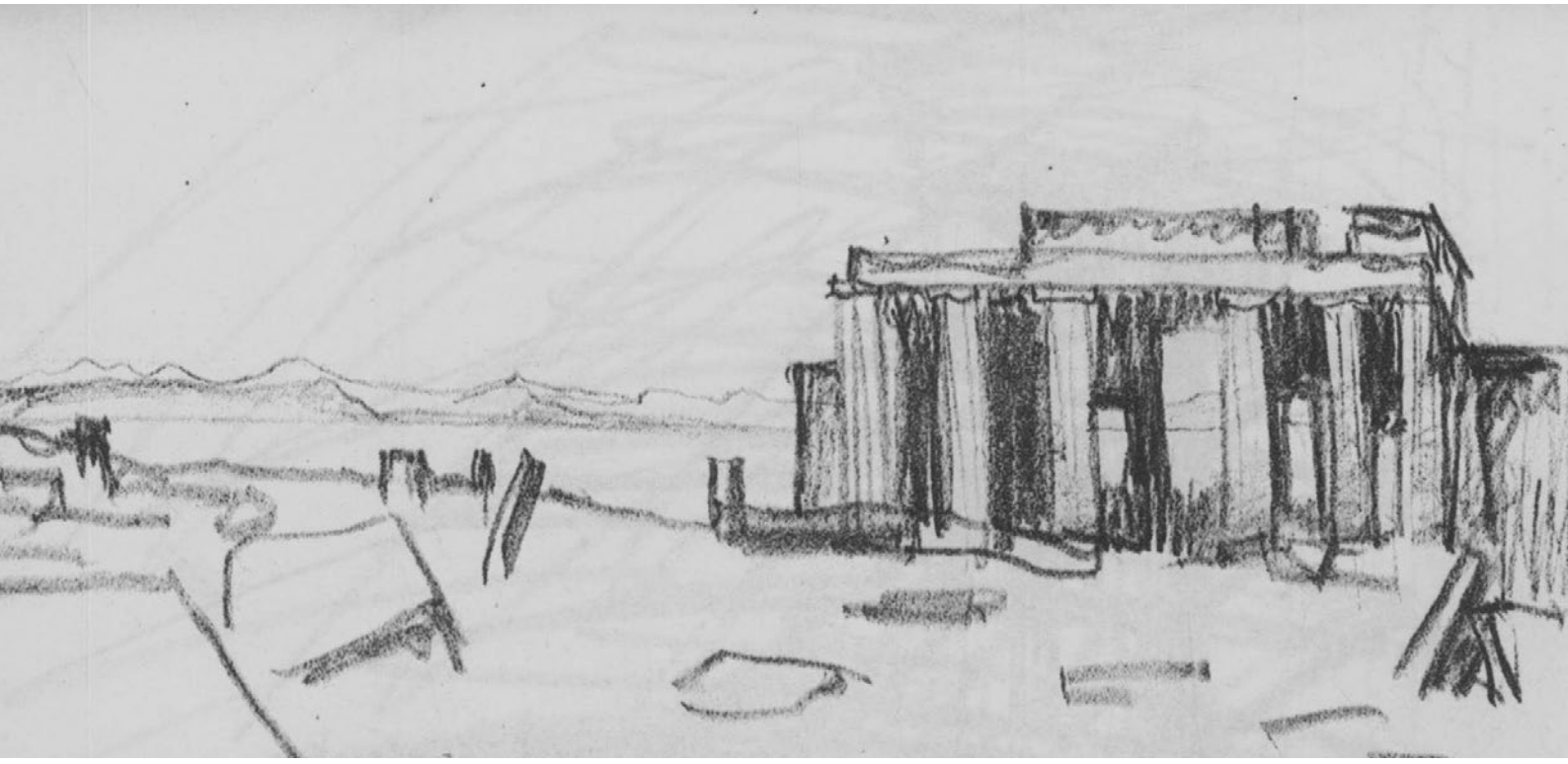


Fig. 149: Sketch of the Propylaea, p.125 (LC, Voyage d'Orient, Carnet 3).



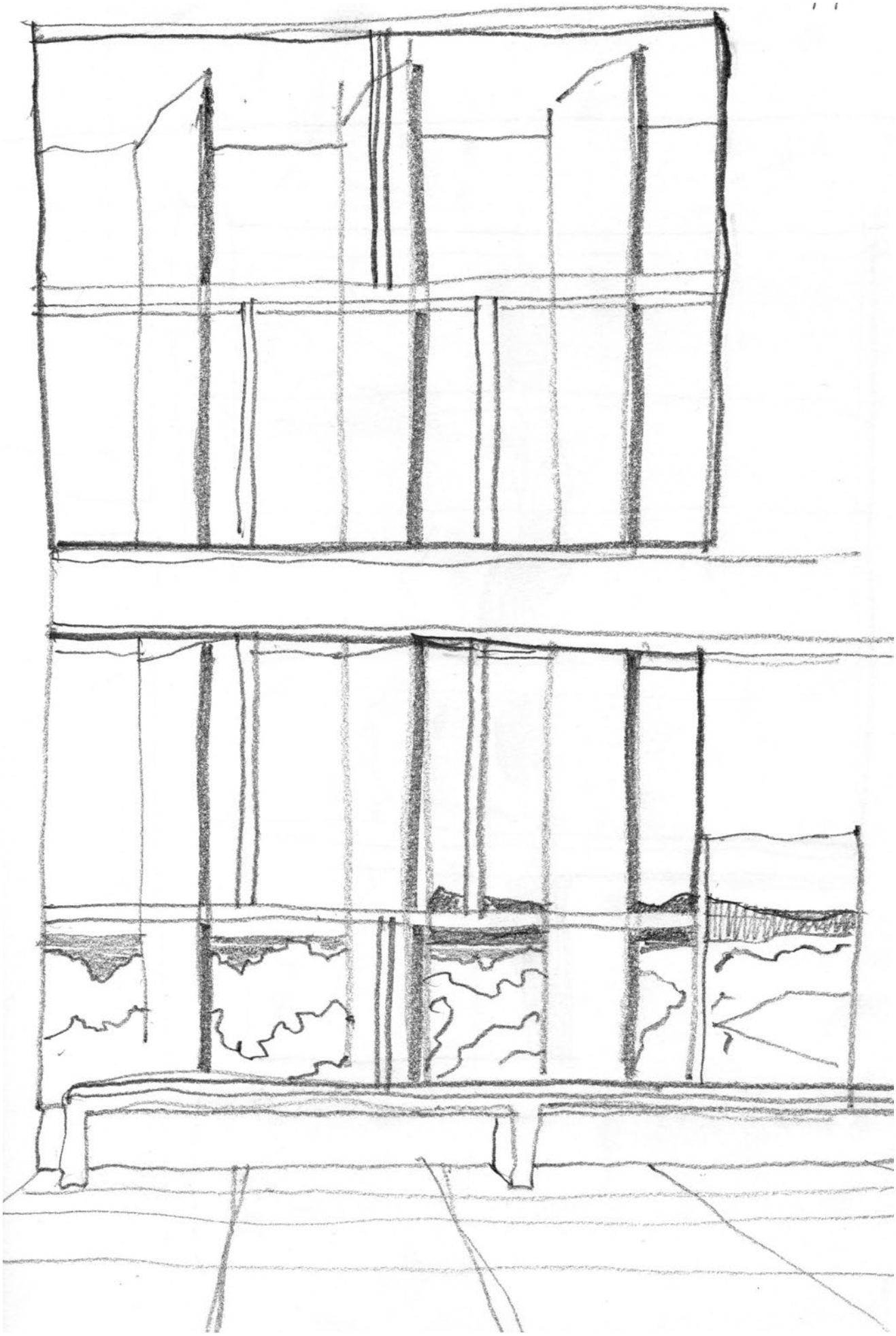
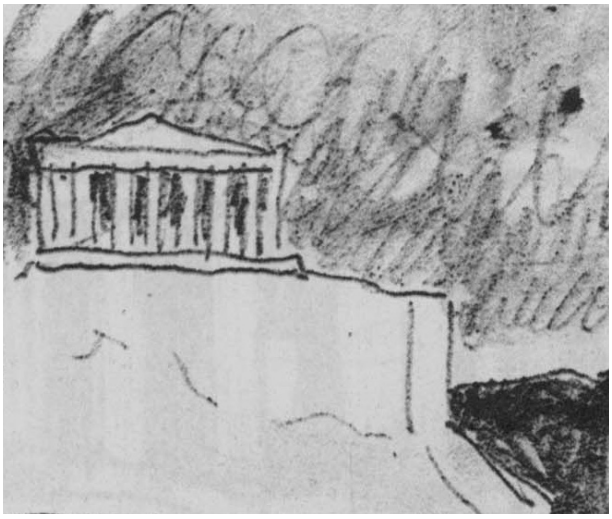
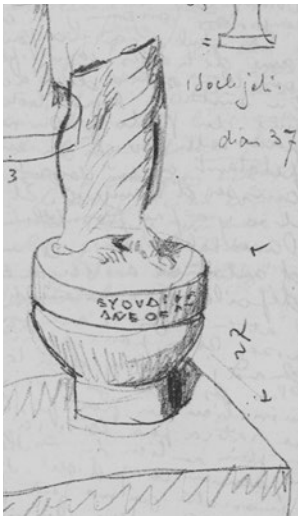
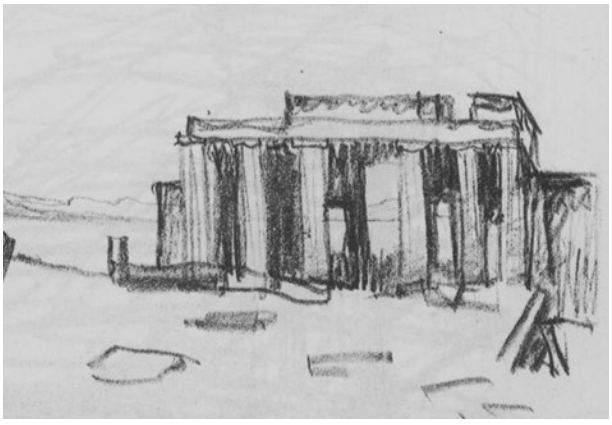


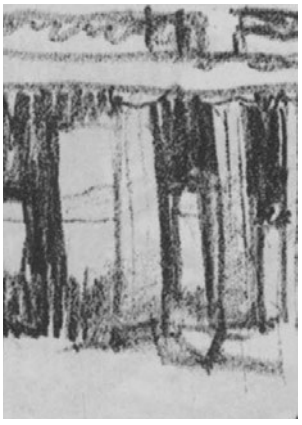
Fig. 151: ABOVE and LEFT: Views to the south from the internal street on the third floor of the Unité (SH)

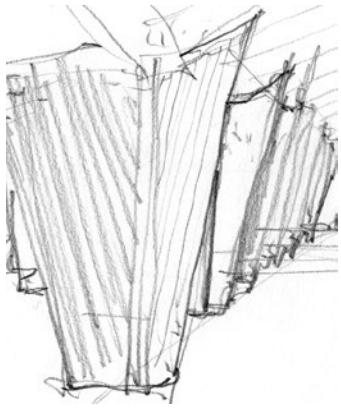
Fig. 150: Sketch from the Propylaea facing west to the Parthenon, p.115 (LC, Voyage d'Orient, Carnet 3).

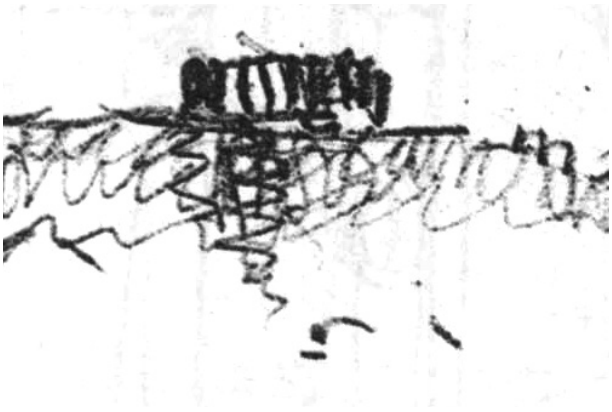












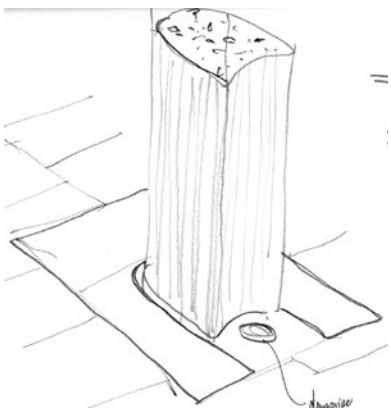
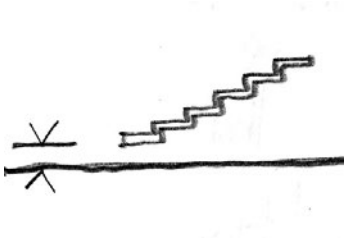


Fig. 153: Floating above ground: Sketch 107 (LC)/ stair detail (LC)/ Rooftop stair in the Unité (SH) / Diagram of steps and ground (SH)



Architecture and the ground

The Unité combines four main types of relationship between the building and the ground, ranging from clear separation to being sunk into the ground plane. Le Corbusier's awareness of the importance of these relationships can be seen in his Acropolis sketches in which he chose to distinguish between these types at various different points around the Acropolis.

Fig. 155: Plinth separating building from ground: Sketch 123 (LC) / Sketch 119 (LC) / Unité chimney (SH) / Diagram of chimney base and ground (SH)

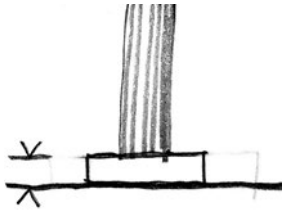


Fig. 154: Junction of column touching the ground: Sketch 125 (LC) / detail sketch 125 (LC) / Pilotis at the Unité (SH) / type diagram (SH)

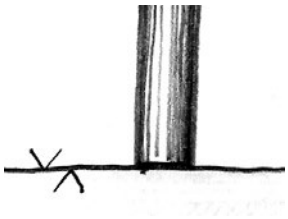
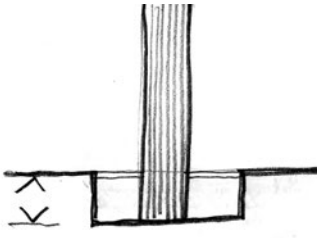


Fig. 152: Architecture emerging out of the ground: Sketch 98 (LC) / Sketch 123 detail (LC) / Column in Unité foyer (SH) / Diagram of foyer column (SH)



The question – what influence did Le Corbusier's travel sketches have on his later projects? - can be answered in two ways: First that his sketches of ancient precedents provided initial ideas from which to start his own designs (as is likely to have been the case in Ronchamp), or second, that the ideas he developed in his early travel sketches were then developed on continuously throughout his career, transforming into modified versions of his initial reactions to the Acropolis and other ancient sites.

Nevertheless, the relationship between his early travel sketches and his projects is not purely visual, even though in some cases the proximity between them is striking. The Unité was not intended to directly copy spatial sequences from the Acropolis, but was designed to reflect the same underlying ideas and ways of seeing that Le Corbusier first became aware of whilst sketching the Acropolis.

In conclusion, to quote Siza (1988): "We perceive in a non-mediated way. That which we learned reappears dissolved amongst the lines which we later draw". In the design of the Unité, there were undoubtedly ideas closely linked to those which Le Corbusier first formulated on the Acropolis sketching in-situ. The influence of the Acropolis sketches is not direct, as may seem to have been the case in designing Ronchamp, but it reflects a career-long process developing the same ideas whose origin may be traced back to the time Le Corbusier first spent sketching on the Acropolis.

Fig. 156: Acropolis in 1911: Sketches 98, 123, 125 (LC)

Conclusions

The comparison of the Unité in Marseille with Le Corbusier's travel sketches of the Acropolis establishes the connection between the discovery of architectural concepts and their application in design. The idea of the connection between antiquity and this particular project was stated by Le Corbusier himself, and has been enlarged upon in the recent academic literature. However, it has served the purposes of this argument by graphically demonstrating how a set of ideas developed in the form of rapid in-situ sketches may be inspired by an architectural precedent and then applied back into design at a later time. Despite the time lapse of over 30 years, there is clearly still a distinct overlap between those ideas first identified at the Acropolis using his in-situ sketches, and the result of his design for the Unité. Consequently it can be argued that the Acropolis sketches were in fact

Fig. 158: La Maison des Hommes, 1942 (LC)

Fig. 157: Ronchamp 1951: Site sketches from a passing train (left and centre), Design sketch (right) (LC)

the genesis of the design of the Unité, in effect the first sketch of the design (Oechslin, 1982b).

The approach of comparing Le Corbusier's sketches to the authors own sketches has its limitations, but also opportunities to see common ideas shared between the two more clearly. The example has compared travel sketches of the precedent to travel sketches of the final built project. Although these are by different authors, more significantly they both show buildings in their actual physical conditions (rather than as a hypothetical design) and in the real context of place. Precisely because the Acropolis and the Unité are different buildings in different locations, the difference in time between the sketches is much less important than the fact that both use an equivalent means to uncover and record ideas through real embodied experience and with an equivalent intention of drawing to investigate underlying architectural concepts.

Although in this case remote, the continuity of ideas between precedent and built project shows that the travel sketches of the Acropolis and the design of the Unité formed part of the same experimental and propositional process of design.

CHAPTER 6

SIZA, FORMENTOR

A comparative analysis of Siza's site sketches and design sketches behind his house in Formentor, Mallorca.

In the previous example, Le Corbusier analysed the Acropolis in order to learn about it, although with no direct design project in mind at the time. However, at times architects also draw in-situ with the deliberate intention of designing a building to go there. Although this intention is more direct than in the previous case, both examples share the essential aim of sketching in order to investigate a place, and then to apply this knowledge to a design project. The focus of the argument now shifts from that which can be learnt in-situ, to how this can be transferred in to the design process in order that the resulting building may relate as well as possible to the place it was specifically conceived for. A recent case study serves to illustrate how this may be done and what benefit this may have for connecting a design to a particular place. A significant example of an architect who has based

his whole work on achieving this synthesis, between project and place is Alvaro Siza, and a recent building of particular interest in this respect is the house he designed in Formentor, Mallorca (Souto de Moura, 2012). A discussion of the underlying design process may help to illuminate the questions and opportunities for designing place in the future. This example extends the argument of the preceding chapters in three ways. First, the architect's in-situ sketches are compared directly with his own design sketches. Second, the example illustrates a very short time gap between in-situ sketch and design process (one which is apparently in some cases simultaneous). Third, unlike the previous example of Le Corbusier's Acropolis sketches and his project in Marseille, both the in-situ sketches and the design sketches refer to the same place, if not the exact site in question.

Although it is widely held that travel sketches inform the design process, this chapter considers how they can contribute to the entire design process rather than remain as little more than an initial start point for a project. Through investigating the development of a place-specific project over time, and observing when and how the course of the design is influenced by site sketches, this chapter intends to illustrate how sketches made in-situ may direct the evolution of design throughout its different stages. Having shown in the preceding chapters that important design ideas can develop out of travel sketches, the aim of the following case is to investigate precisely how in-situ sketches may be incorporated most productively into the design process itself. This asks precisely how can in-situ sketches contribute to the design of place throughout the entire process of design?

The case study is approached through comparing two sets of Siza's sketches, first a pair of in-situ sketches made on and near-by the site on his first visit, and second, a group of design sketches charting the evolution of the project. The in-situ sketches are analysed into their major parts and compared to the set of design sketches, specifying the influence that these initial place sketches had throughout all stages of the design. In so doing certain aspects, important in the initial sketches, re-emerge and gradually come to define the project as it develops. Analysing the design sketches in their original sequence shows how the influence of the site sketches on the new design ebbs and flows throughout the entire process. The final results of the built house show the marked influence of the initial site sketches in the relationship of the new building with the place itself.

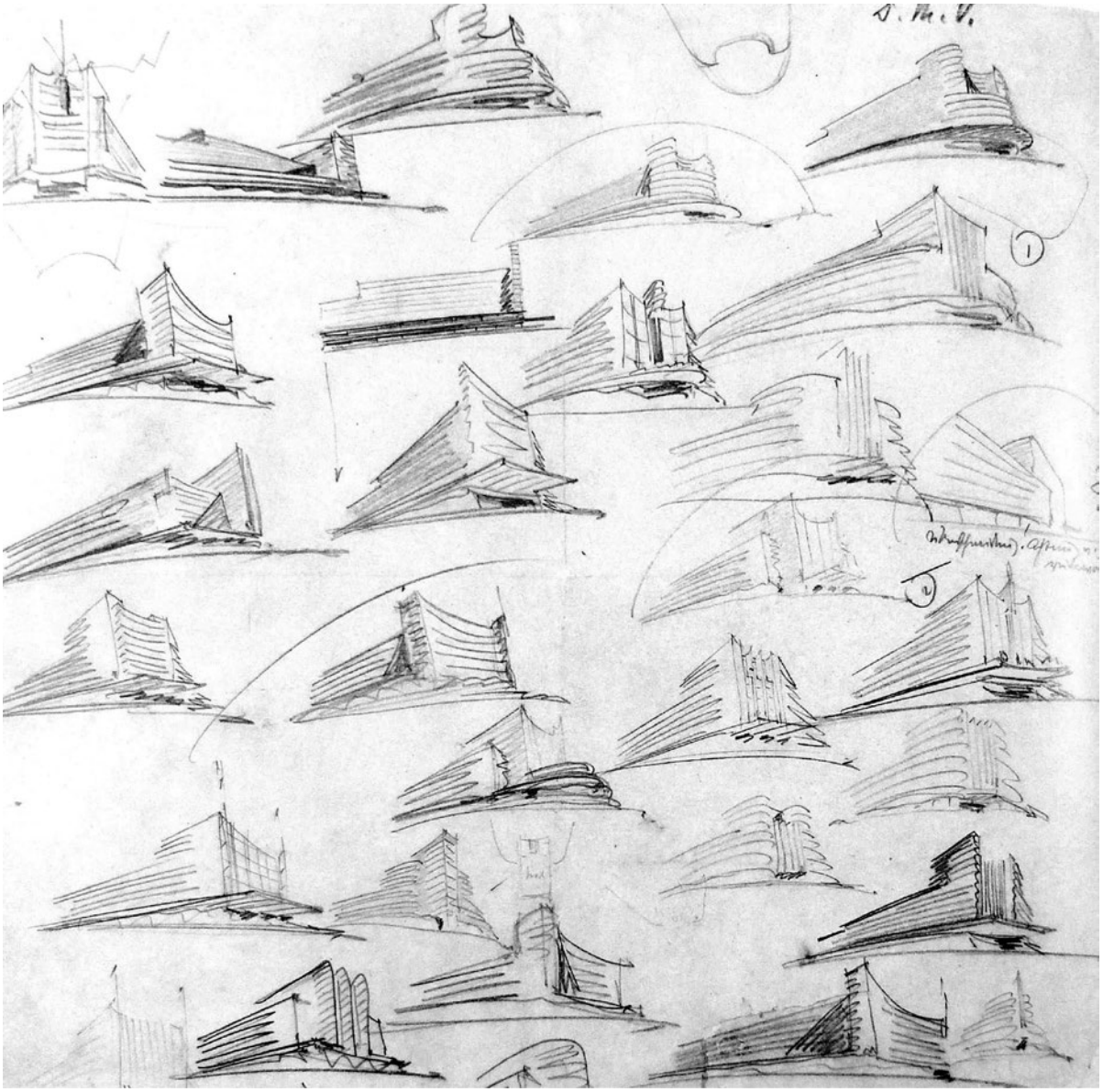


Fig. 159: Design sketches, (Mendelsohn).

In his text "The importance of drawing", Siza (1997) explains that Architecture is closer to music than to painting. Architecture is about space and light amongst other things, but not about pictures. Designing architecture is a matter for the mind, sketch or no sketch. However sketching does help to find things and explore them in a way which helps the thought process through the very complicated and mystifying design journey. And through practicing sketching, it helps to keep us alert to the things around us which construct the dialogue between architecture and place (Roqueta, 1999).

The example of Siza has been chosen to explain this part of the argument on account of his ceaseless use of drawing to dis-

cover, develop and explain his design ideas. Whilst architects such as Mendelsohn developed the aspects of their buildings through great numbers of sketch iterations (Fig. 159) (Mendelsohn & King, 1969), Siza's sketches stand out in particular for their concern with place. This point of view, fascinated by the existing things that make places unique, also manifests itself in his projects which repeatedly develop in close dialogue with the nature of the site. Siza is also known to start developing ideas for his projects whilst drawing on site; Kenneth Frampton (2010) describes this process literally drawing his projects out of the topography of the site. Siza's insistence on designing architecture around place, designing through sketching, and combining the two by design sketching in-situ, make his work especially illuminating for this part of the argument. A brief example of how Siza has used site sketching in his design will introduce his methods of working. When beginning his masterplan for the new residential area of Malagueira, Siza spent considerable time exploring the site and drawing what he found. One sketch shows a view looking across to the town of Evora on a hill nearby, in the foreground he includes a tree and a small fountain. For some reason at first unclear, he decided that these elements were important (Fig. 160). In fact he decided that their significance to the

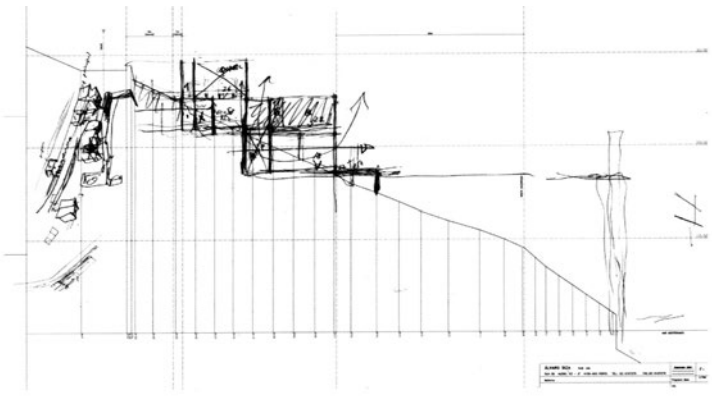
site could potentially be far greater than in their present state. The potentially focal role of these elements was then developed in design sketches which showed these same elements covered by a great half cupola at the centre of his new masterplan (Melian Garcia, 2006). This decision about where and how to focus the centre of the large urban plan was highly subjective – the existence of small elements such as these (which were later jettisoned in any case) served as no more than a clue from which to make a subjective decision. Despite their relative insignificance, once decided this formed the focal point of the project forming one of the many sequential steps through the design process. In this example, the process of sketching helped Siza to discover a small localised detail but, more importantly, it allowed him to see its potential significance, and to develop it into a crucial factor, structuring, in its initial stages, the entire design. In a similar way, equivalent elements from and around the site at Formentor appear in Siza's initial site sketches, and gradually reappear transformed in the design sketches.

Of Siza's recent projects, the house in Formentor has been selected to answer these questions for a number of reasons. Site sketches have played a subtle, yet crucial role throughout the design process significantly stimulating the relationship between project and place. The small scale of the project allows the investigation to reach detailed conclusions. The project and its site also share significant connections with other case studies in the thesis, particularly Can Lis. The project was completed in 2010, so this chapter contributes to the relatively small amount of critical literature published about the house so far (El Croquis, Nº 140; Souto de Moura, 2012).

Fig. 160: LEFT: In-situ sketch of the site for the development at Malagueira, with font, tree and skyline of the city of Evora in the distance (Alvaro Siza, March 1977).

Fig. 161: CENTRE: Design sketch of the central space for the development at Malagueira, showing a half dome over the tree and font. Evora skyline is also shown. (Alvaro Siza, 1979, Sketchbook 39).

Fig. 162: RIGHT: Section through the site at Formentor showing the upper road left and sea level on the right. (Alvaro Siza).



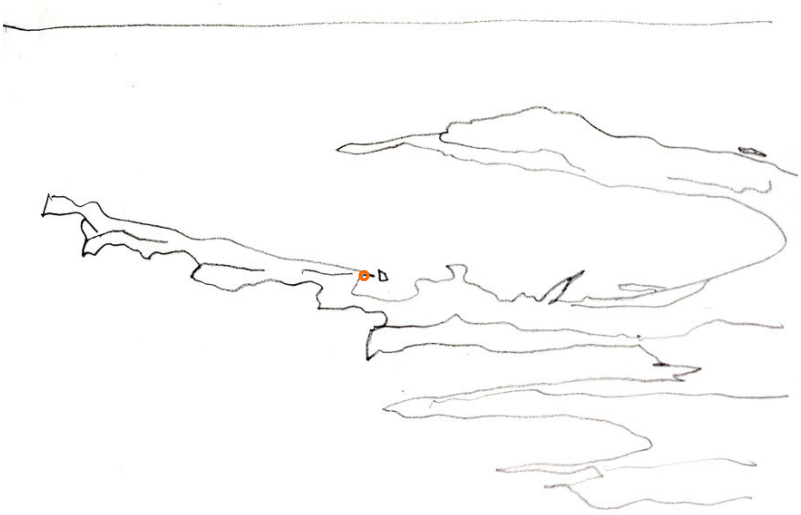
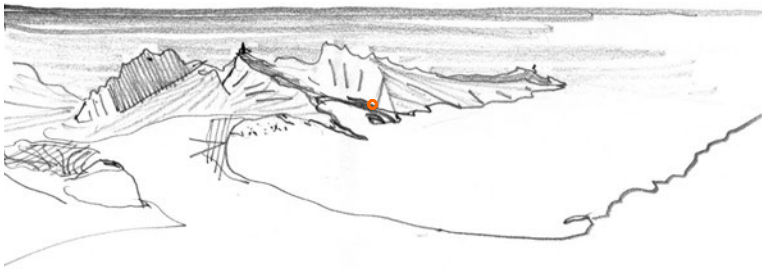


Fig. 163: Aerial views from a plane of the Formentor peninsula and site. Facing East across the Formentor Peninsula (left) Bay of Pollensa and Alcudia Peninsula (right). (SH).



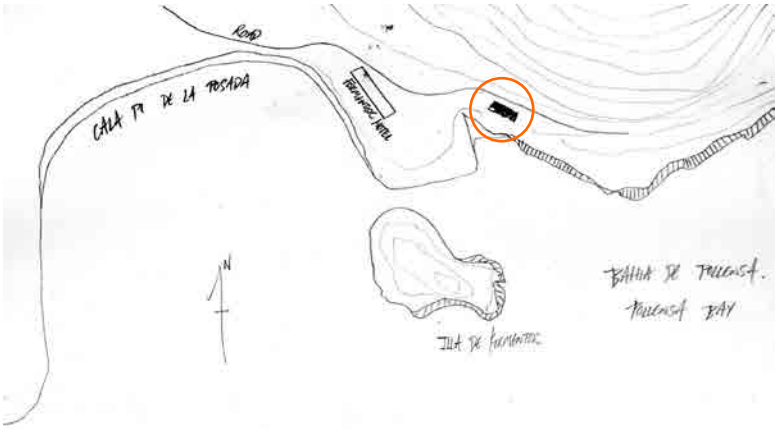


Fig. 164: Sketch site plan. (SH).

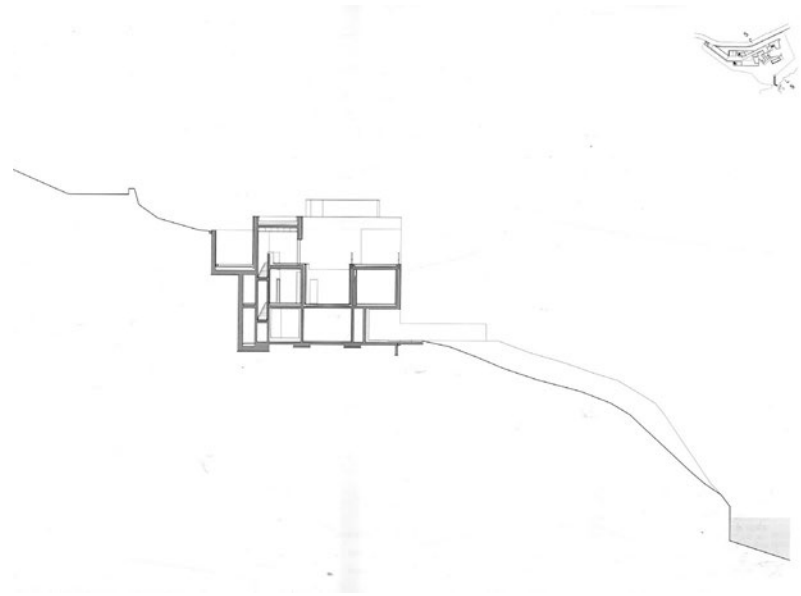


Fig. 165: Site Section. (Source: Souto De Moura 2012).

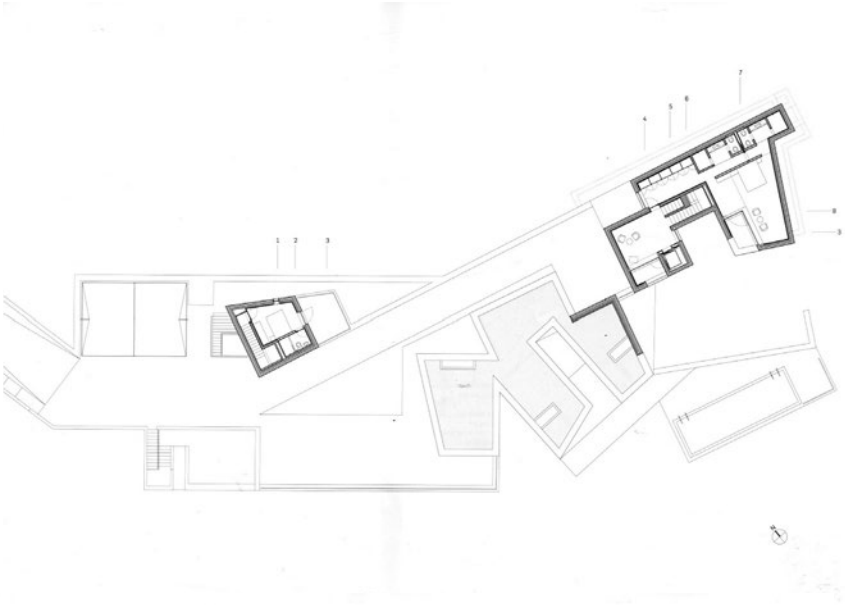


Fig. 166: Second floor plan. (Source: Souto De Moura 2012).

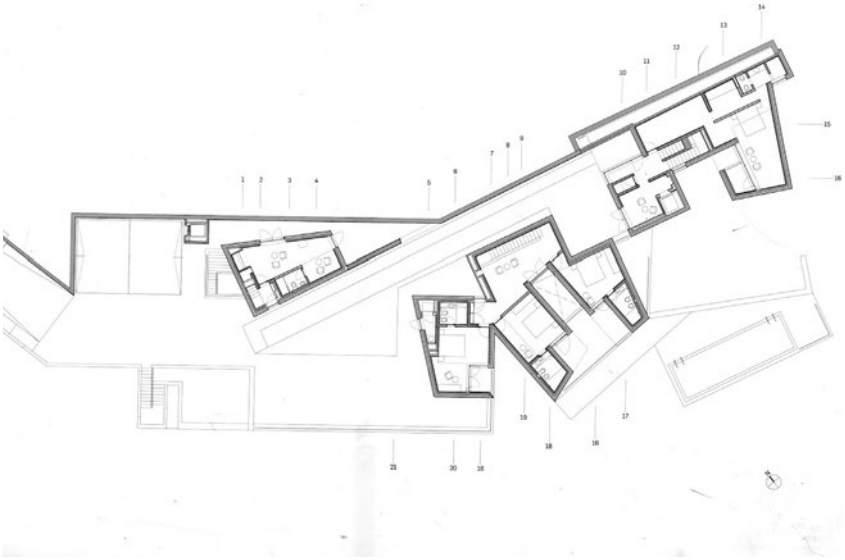


Fig. 167: First floor plan. (Source: Souto De Moura 2012).

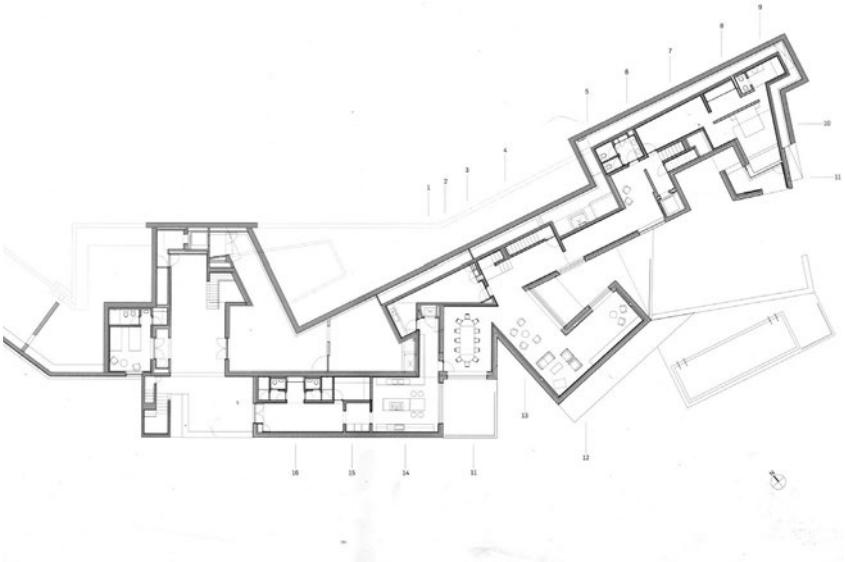
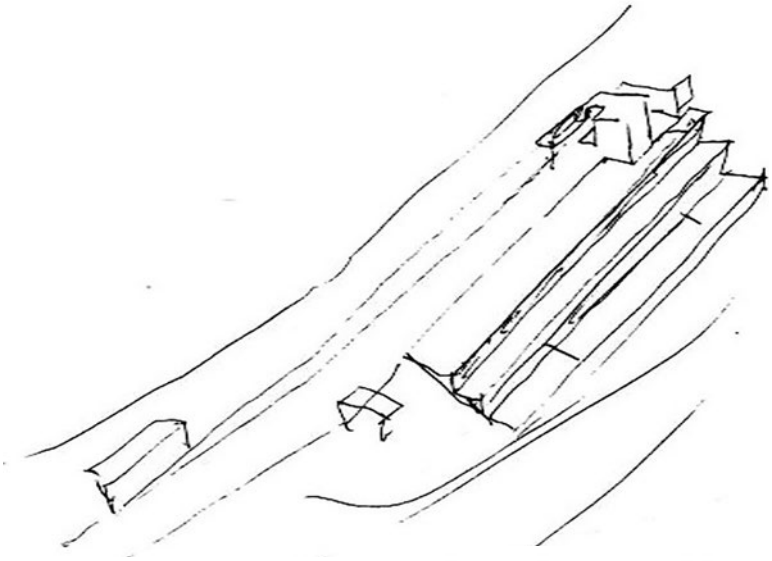


Fig. 168: Ground floor plan. (Source: Souto De Moura 2012).



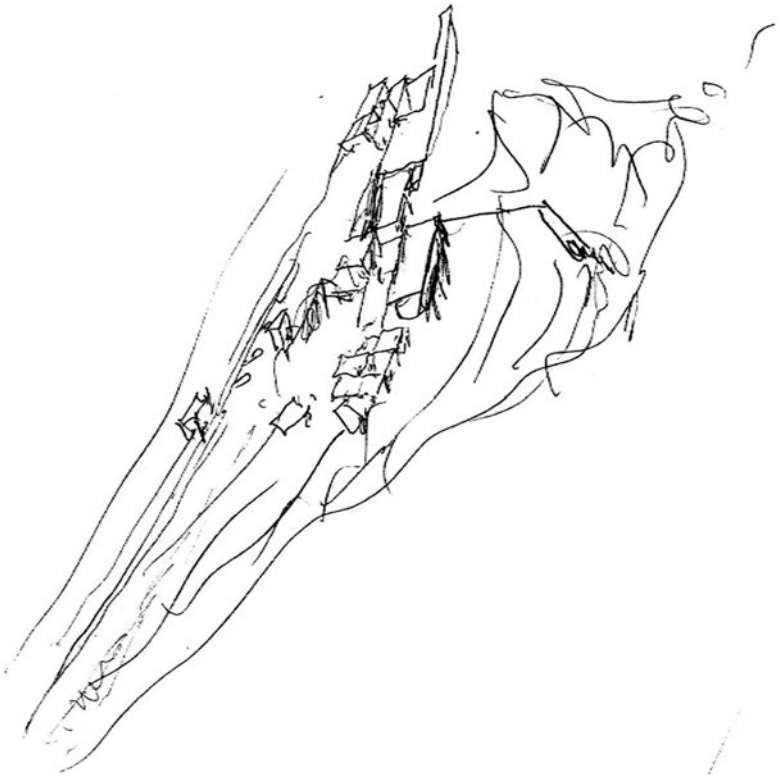
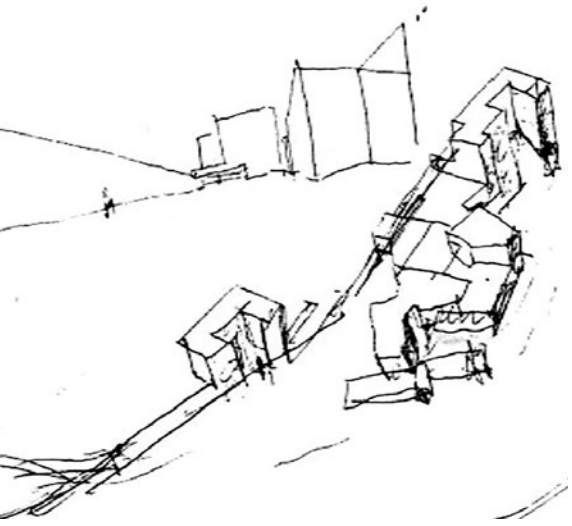


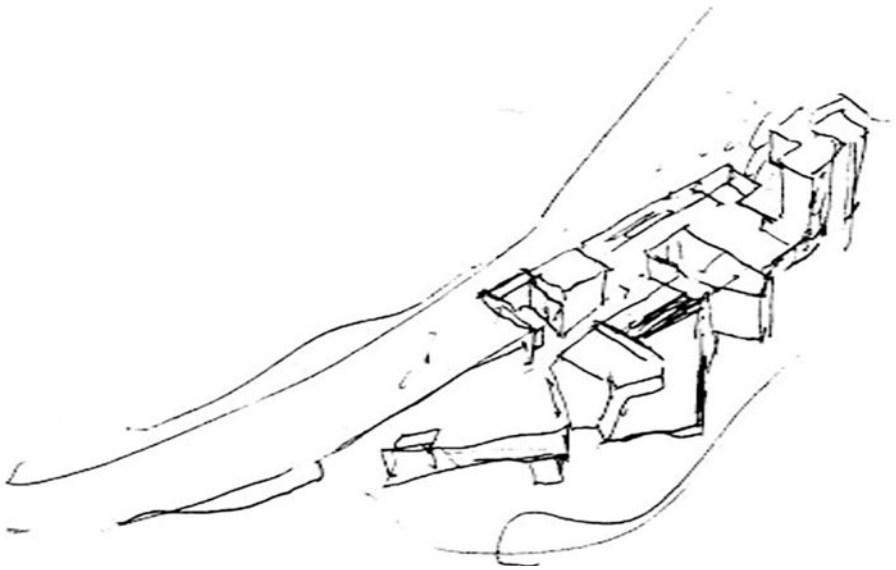
Fig. 169: TOP LEFT: Initial site sketch, Formentor, Mallorca (Alvaro Siza).

Fig. 170: LEFT TO BOTTOM RIGHT: Sketches from different stages of the design process, in chronological sequence left to right. House at Formentor, Mallorca (Alvaro Siza).

The material regarding the design of the house consists of two in-situ sketches, and a collection of design sketches, mainly aerial views of the project and site. These two groups are first discussed separately and then connections are made between them showing how the ideas of each increasingly intertwine throughout the course of the design. A set of design sketches for the house have been arranged in their most likely order of development. These have been put into order by the author according to the most direct path of development between them. Mainly aerial views of the project and site, the majority of these focus on the external massing of the house, as seen from the aerial view from the sea to the south. Although there are interior sketches, given the conflict of ideas with the owners about the internal spaces, the influence of external factors and ulterior motives is likely to have largely outweighed the effect of site-sketches on the interiors (Muro, 2015). Therefore the relationship between architecture and place is considered principally in terms of the exterior form and massing of the building and the landscape it fits into.

Regarding Siza's design of the house in Formentor, the initial meeting between the client and architect took place at a visit to the Casa Ugalde designed by Coderch. A number of parallels have been drawn between this house and Siza's project (Quetglas, 2007). On Siza's initial visit to the site in Formentor, he produced a number of site sketches, two of the most significant in terms of the design process are reproduced. These two sketches concentrate on the characteristics of the surrounding place rather than on the view of the site itself – the first faces up the hill to the neighbouring buildings, the second faces out along the coast from the bottom of the site.





Although Siza made a number of sketches during his first visit to the site, two in particular suffice to analyse the developing connection of the building with place during the course of its design. Of these two initial sketches, one shows a set of buildings emerging out of vegetation set up a steep hillside. It characterises the surrounding houses as a collection of cubic volumes set at irregular angles with greenery in front of and behind them, with many openings and niches carved out of them. The image shows the typical character of the place through the relationship between existing buildings and the landscape although it does not show the actual site, and the viewpoint appears to have been further along the road to the west. The second sketch shows a fast but carefully observed view from the lower part of the site itself facing in the opposite direction south-west along the immediate coast line. It shows the existing relationship between the edge of the sloping site, the line of pine trees, the low cliff, the rocky foreshore, sea and horizon. It also shows a set of stone retaining walls built as terraces retaining a garden further along the coast behind the beach. Both sketches show different physical elements of great significance to the character of the site.

Fig. 171: Initial site sketch, Formentor, Mallorca (Alvaro Siza).

Fig. 172: Initial site sketch, Formentor, Mallorca (Alvaro Siza).

The design of the project relates closely to various aspects of these sketches. Rather than merely serving as an initial point of inspiration, these characteristics are applied gradually throughout the course of the design process. As a result, the design is tuned little by little to the specific nature of the place ending in a project which, in spite of its form and colour, is highly adapted to its site and context. The initial site sketches provide a continual influence throughout the design process, repeatedly bringing the project's new ideas back into the context of the site. In order to understand this continual role, it is necessary to consider how they influenced the design at all different stages and not purely at the beginning or final stages of the project.

The design of the house in Formentor is now discussed in five points to show how and when site sketches and the design process interrelate.

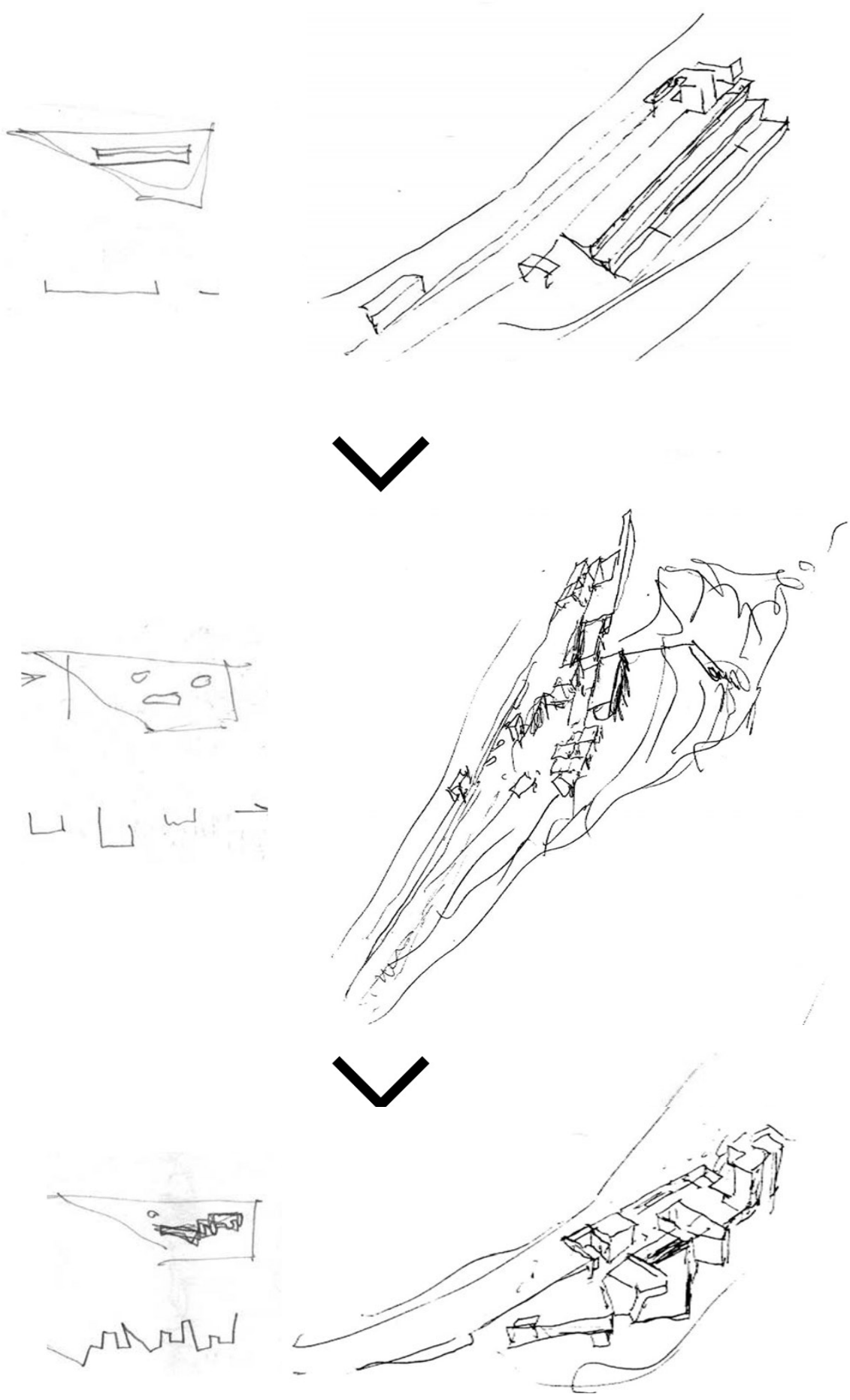


Fig. 173: LEFT top to bottom: Concept diagrams analysing Siza's design sketches at different stages of development (SH).

Fig. 174: RIGHT top to bottom: Design development sketches (Siza).

Fig. 175: In-situ sketch (Siza).

Fig. 176: Conceptual diagram of in-situ sketch (SH).

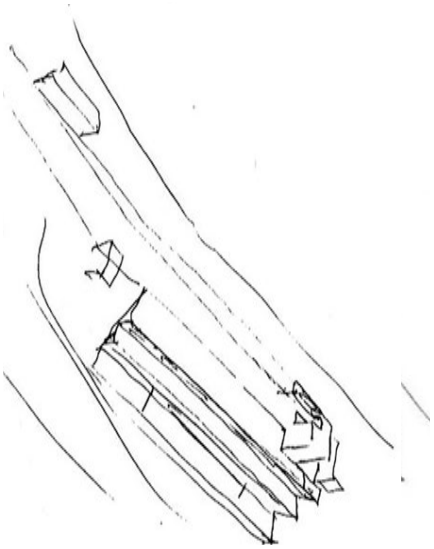
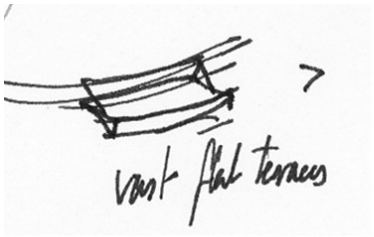


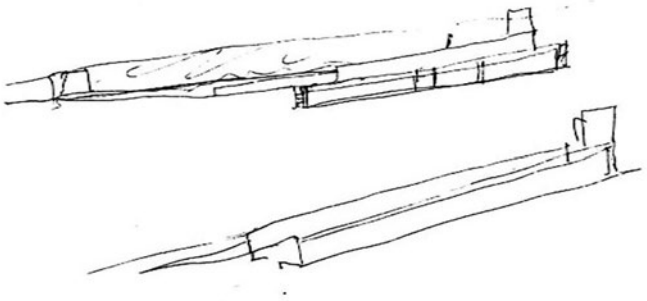
Fig. 177: Early design sketch (Siza).

Fig. 178: Concept diagram of final design (SH)

The gradual fragmentation of the house during its design is a case in point. In the initial sketch of the coastline (FIG), the zagged line of rocks and the irregular terrace walls which follow the line of the foreshore has been drawn with the greatest attention. Although the tree trunks have been drawn with some precision, the tree canopy, horizon and immediate foreground of the site itself are secondary. During the design process, the facade line of the house design gradually changes to increasingly reflect the fragmentary boundary between land and sea. Early design sketches show a set of straight parallel terraces, an intermediate sketch shows a number of isolated volumes spread out across the sloping site and the final sketches show a single building mass whose seaward facing edge is staggered, broken into an angular, deeply indented facade equivalent in its basic form to the contours of the rocks below.

The other site sketch shows a set of isolated buildings scattered amongst foliage up the hillside, all facing different directions and with different arrangements of openings. Little by little, the design of the house is broken up vertically giving an appearance of independent buildings, each with its own orientation. The large parallel horizontal terraces are replaced with individual bases each set at its own level, recalling the main characteristics of the site sketch. The position and form of the window openings show different ways of relating interior spaces to external terraces patios and views.





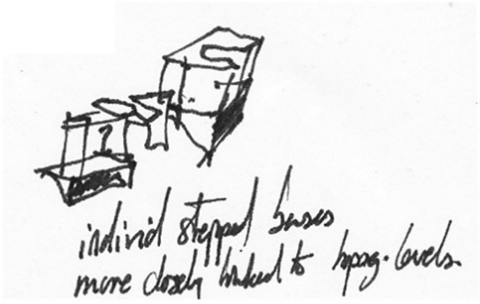


Fig. 179: LEFT: Concept diagrams based on Siza's design sketches to the right (SH).

Fig. 180: RIGHT: Design sketches at early (top) and later stages (bottom) of the project. (Siza) cept diagrams from the design sketches (SH).

Fig. 181: Initial site sketch, Formentor, Mallorca (Alvaro Siza).

Fig. 182: Concept diagram from Siza's in-situ sketch (SH).

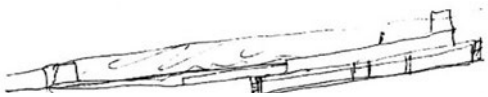


Fig. 183: Initial design sketch, Formentor, Mallorca (Alvaro Siza).

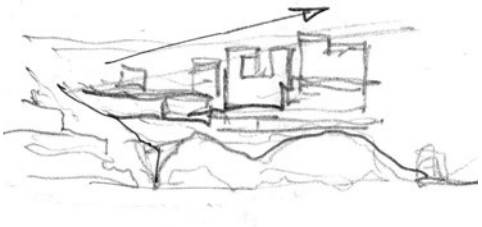


Fig. 184: Concept sketch of final design, Formentor, Mallorca (SH).

The site sketch also concentrates on the sculptural form of the surrounding houses, drawing windows terraces and balconies in some detail. The three dimensional sculptural interest in the neighbouring constructions is reflected in the evolving form of the house, where patios, windows and porches are carved out of the irregular building masses. The interlocking solid and empty volumes of the building become increasingly complex as the project evolves, developing towards ideas similar to the initial site sketch.

Fig. 185: Initial site sketch, Formentor, Mallorca (Siza).

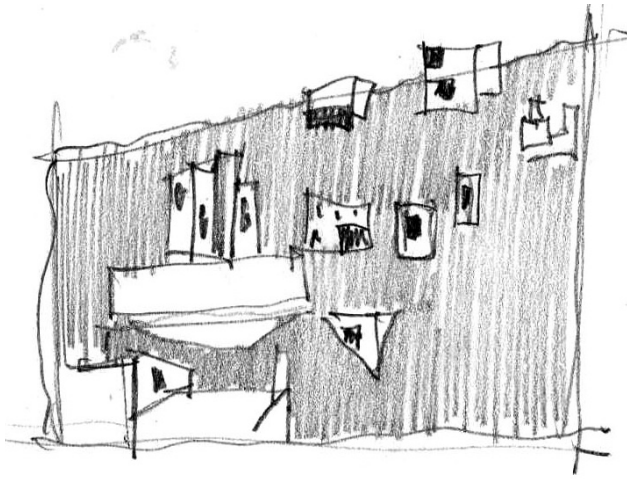


Fig. 186: Concept diagram from Siza's site sketch (SH).

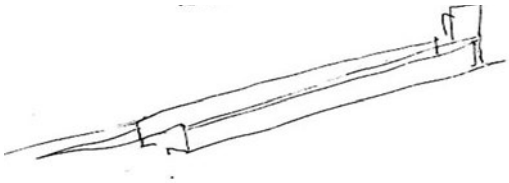


Fig. 187: Initial design sketch, Formentor, Mallorca (Alvaro Siza).

Fig. 188: Concept sketch of final design, Formentor, Mallorca (SH).

The effect of carving openings into the building masses is also connected to Siza's opinions about the view of the landscape, and contrasts significantly with Le Corbusier's sketch from the Formentor hotel a few hundred meters away (Fig. 189). Whereas Le Corbusier sees the window as a frame for the landscape which the observer is utterly isolated from, becoming in effect little more than a projection on a wall (Quetglas 2007), Siza allows only tangential views towards the sea across interstitial patios or porch spaces, intensifying the contrast between interior and landscape through providing only glimpses towards the view.

In contrast, in Can Lis, the window openings are focused towards the horizon but the foreground space of the cliff top has a function equivalent to Siza's patios creating an intermediate zone between interior and distance (Fig. 190, Fig. 192). The harshness of the contrast in the light and enclosure is also softened by the depth of the window reveals, which like Siza's windows direct the view often tangentially towards the backdrop of the sea. The fragmentation of the plan form, and the base platform stepping up over the natural contours of the ground also make an interesting comparison with the plan of Utzon's Can Lis (see chapter 8).

Fig. 189: Travel sketch from the Formentor Hotel, Mallorca (Le Corbusier, 1926).

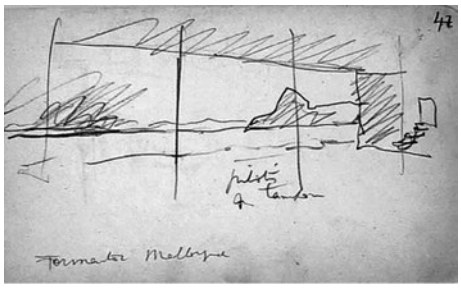


Fig. 190: Sketch plan of Utzon's Can Lis, Mallorca (SH).

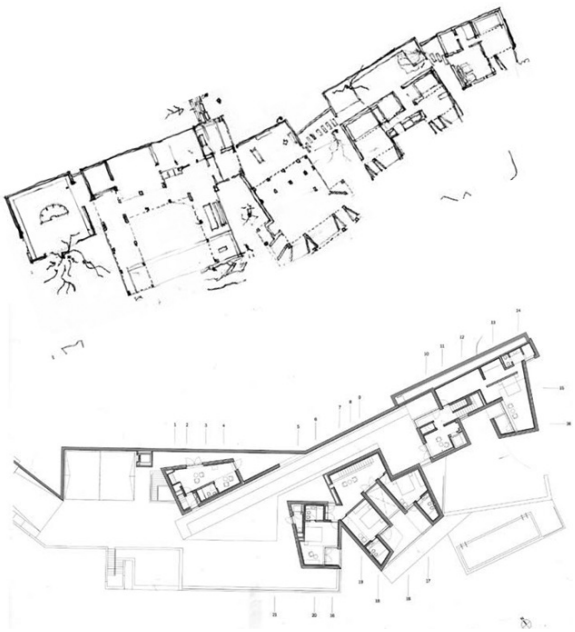
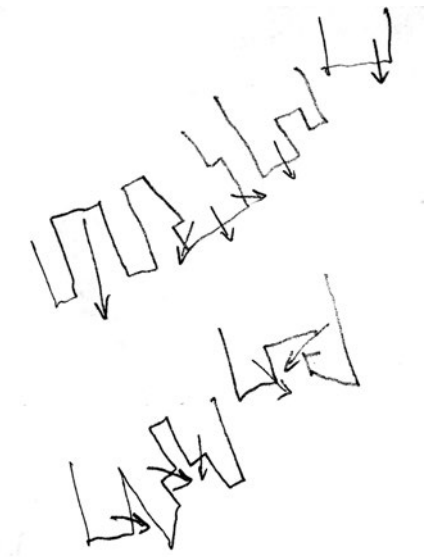


Fig. 191: Final First floor plan of the house at Formentor, Mallorca (Siza).

Fig. 192: BELOW: Comparative diagrams of Can Lis (upper) and the house at Formentor (lower) showing fragmentation of the facade alignment, patio spaces and contrasting approaches to views of the sea (SH).



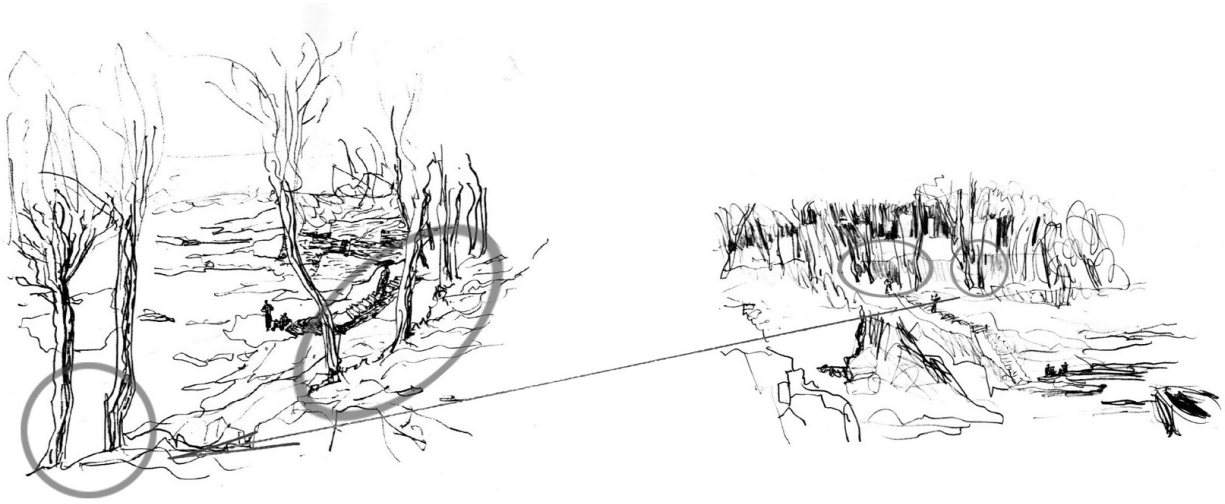
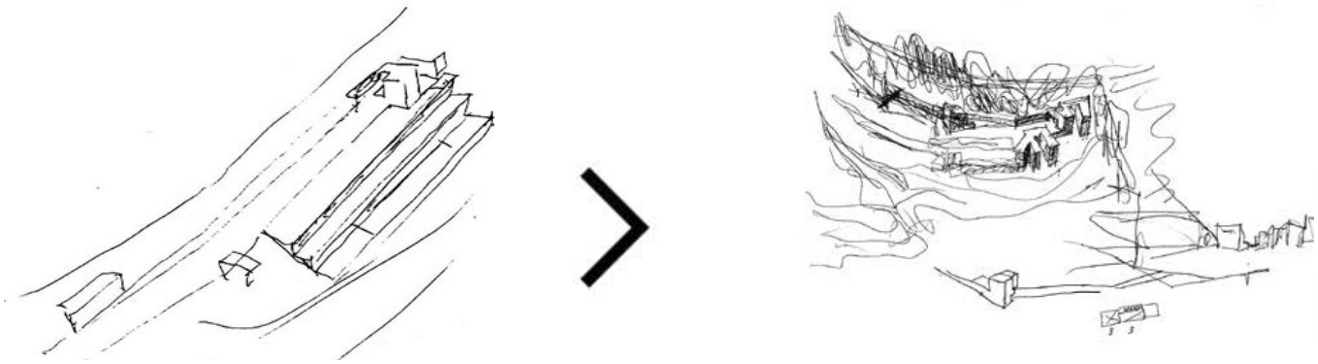


Fig. 193: LEFT: Initial site sketch, Formentor, Mallorca (Siza).

Fig. 194: RIGHT: Design sketch (Siza).

The care with which Siza drew the front line of tree trunks (Fig. 193) reappears in later sketches showing the importance Siza attached to them (Fig. 194). The branches above are represented with little care suggesting that the vertical aspect of the trunks alone was considered important. The profile of the trunks have been drawn with some precision which was later replicated in one of the design sketches. Seen from the house, the tree trunks define a foreground space and frame the sea behind (Fig. 195). From the site these trunks have the effect of delimiting the foreground and framing it against the more distant central part of the view. This overlapping of significantly different depths of field enhances the dramatic spatial contrast between foreground and distance. This idea is compared to the depth of field in Le Corbusier's sketch of the Propylaea and Parthenon (Fig. 196).



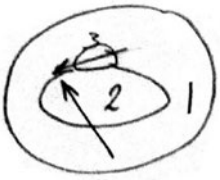
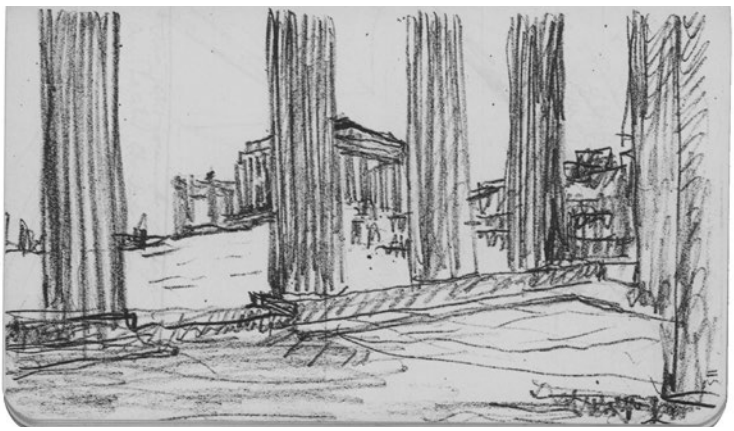


Fig. 195: LEFT: Site sketch (Siza) with depth of field analysis (SH)



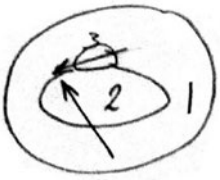
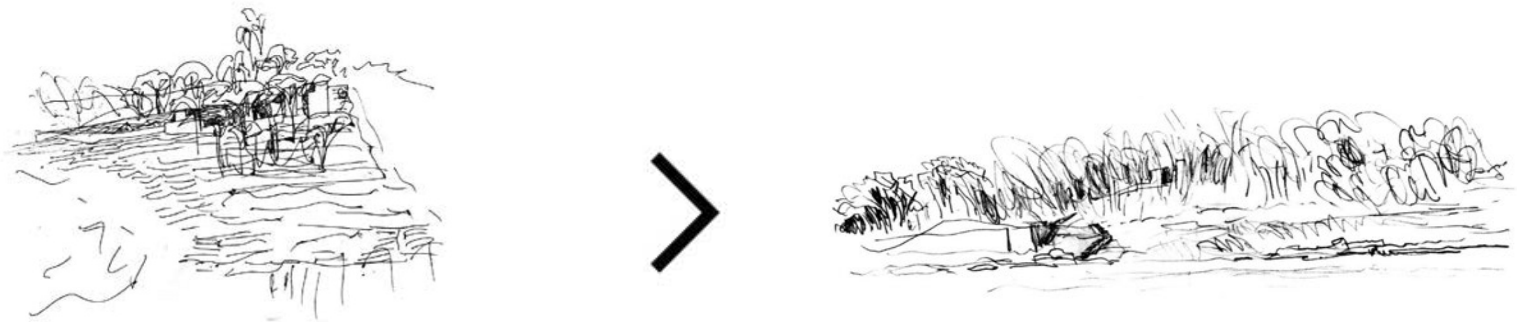


Fig. 196: RIGHT: Propylaea sketch (LC) with depth of field analysis (SH)

Fig. 197: LEFT to RIGHT: Four stages of design development (Siza)



During the design, trees came to take on a significant role. In the design sketches, they are drawn roughly, however their position in relation to the house changes. Fig. 202 right, shows a selected group of trees carefully positioned directly in front of the house. Whilst Siza used existing trees, their position and form was significant to the overall design of the house. Seen from the seaward side, the trees act as a screen of vertical trunks seen against the house, with a mass of foliage behind. During the course of the project, the trees at first do not appear in the design sketches, but gradually come to take an increasingly important role in integrating the house into its context. The contrast of white building volumes against luxuriant foliage is characteristic of the place as the first site sketch shows. This was developed in the design to create an equivalent contrast between the white architecture and the foliage up the rising slope forming a backdrop behind the building.

This is compared to the treatment of pine trees at Can Lis (Fig. 203, Fig. 204).

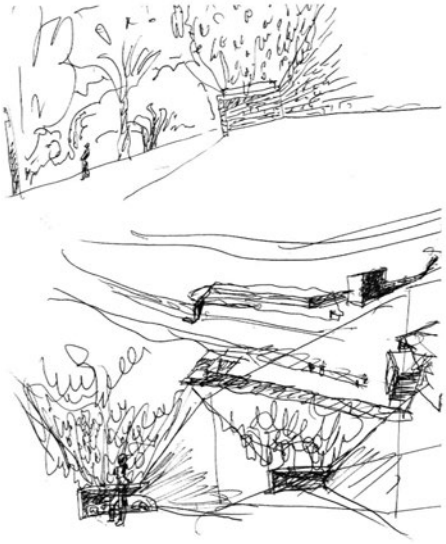


Fig. 201: Sketches of vegetations around the external spaces of the house (Siza)

Fig. 198: Initial site sketch, Formentor, Mallorca (Siza).

Fig. 199: Concept diagram of vegetation from Siza's site sketch (SH).

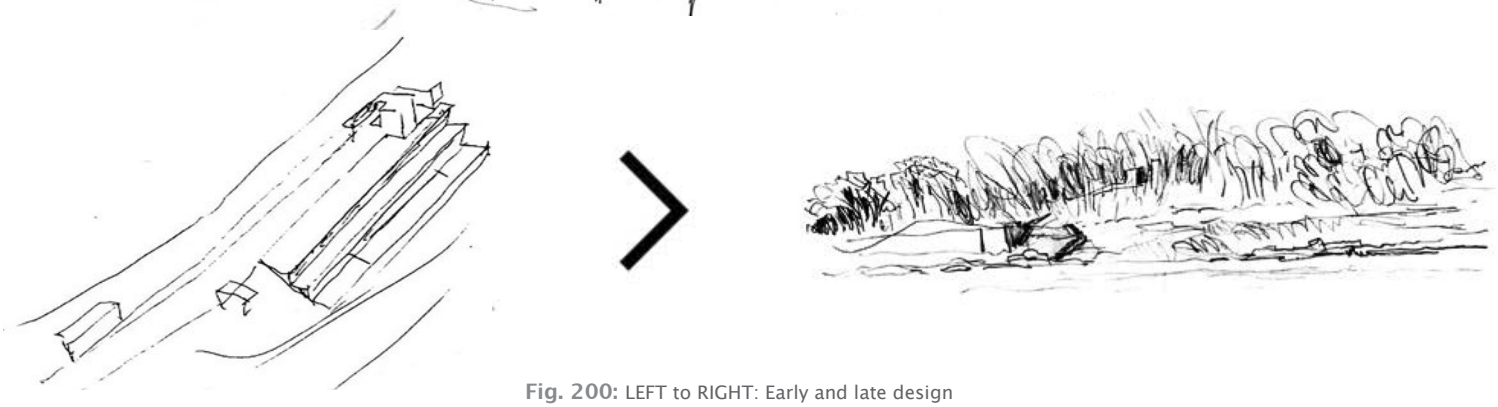


Fig. 200: LEFT to RIGHT: Early and late design sketches, Formentor, Mallorca (Siza).

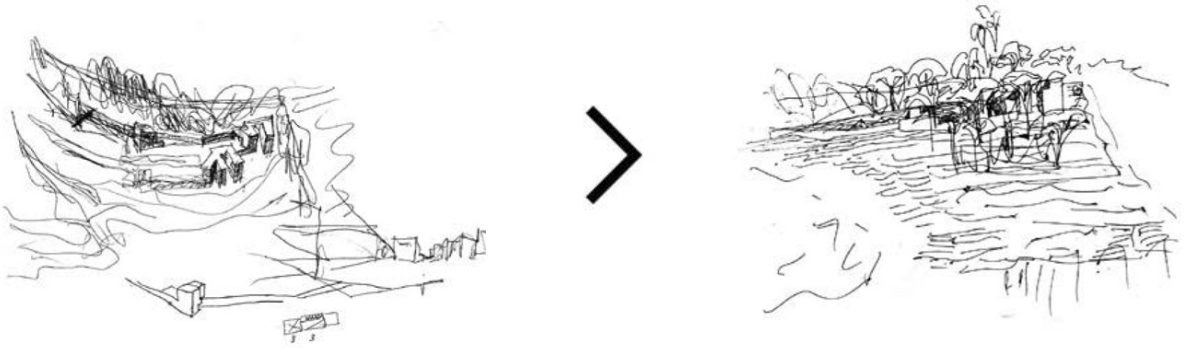


Fig. 202: Design sketches showing different positions of vegetation relative to the house in Formentor (Siza).

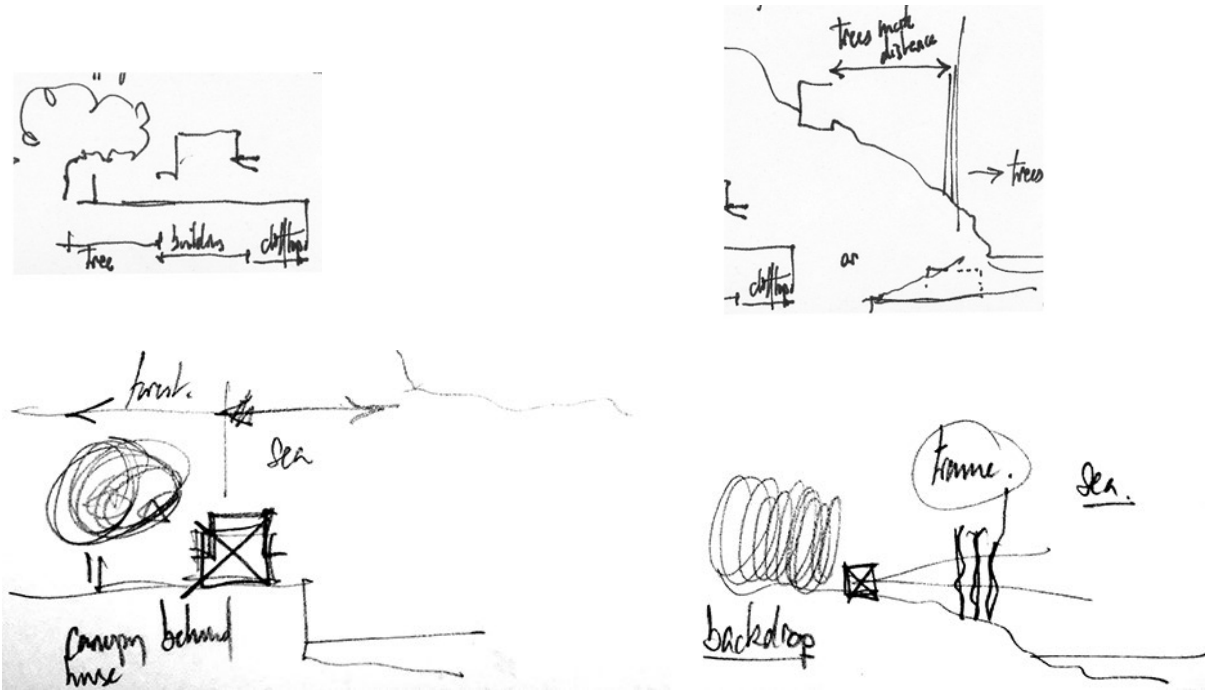


Fig. 203: Section diagrams comparing the position of the trees in relation to the house and view in Formentor (right) and Utzon's Can Lis (left) (SH).

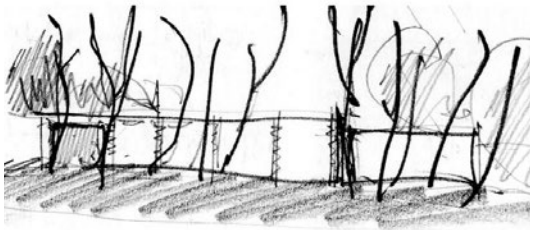


Fig. 204: LEFT: Diagram of Can Lis entrance facade. Pine trees trunks are silhouetted against a blank wall facing the road. (SH).

The initial site sketches were only one part of the range of factors which influenced the design of the house, besides planning regulations, the intentions of the clients and other matters. Nevertheless, those aspects which Siza first noticed in his site sketches, gradually emerge in the design of the house. Whilst ideas foreign to the site (program, materials etc) are introduced, the local ideas which Siza had discovered in the surrounding environment, are continually reintroduced into the design process. The site sketches, and the ideas they contain, have a continued influence on the design at all stages, acting as a guide to keep the project in touch with the specific nature of place.

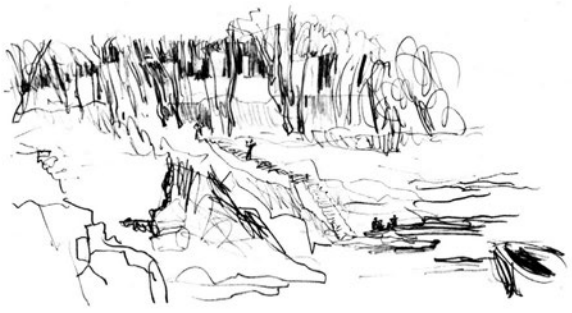
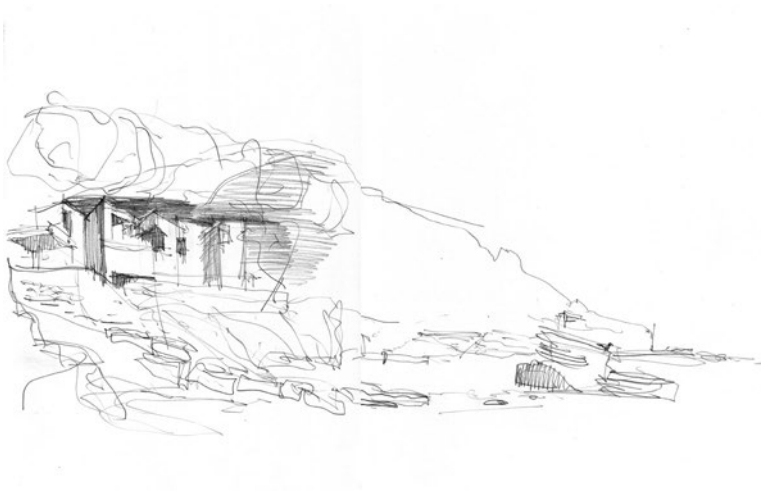


Fig. 205: Original site and design sketches, LEFT (Siza), compared to current in-situ sketches of the built project, RIGHT (SH).



Summary

This chapter proposes that the in-situ site sketch be treated as an integral part of the design process, not merely a catalyst for design, but as a critical factor in the decision making process which affects the entire developmental process behind an architectural project.

Although it is widely held that travel sketches inform the design process, this example explains how this happens, and how in-situ sketches may contribute to the design of place throughout the entire process of design. Through following the progress of this place-specific design made in conjunction with site sketches, this research finds that at first the design deviates from the initial travel sketches, but that as it progresses, the principal ideas relating the project to place, gradually converge with those shown in the initial in-situ sketches. The travel sketches have influenced the project throughout its course, serving as a means to control and guide the design's development, keeping it in tune with certain selected aspects of place. This ensures that the final effect of the design brings out the desired sense of place rather than imposing external ideas unconnected with place.

In order to work, this requires the designer's commitment to reconsider the initial sketches throughout the entire duration of the design process and the design flexibility with which to keep this process in line with those first drawings. The capacity to repeatedly reinterpret site sketches creatively and freely is equally vital. The fundamental aim of this process is to combine local reality with the foreign and new ideas of the architect: excessive reliance on one or the other will reduce the success of the building. A site sketch which has been well used in a design will not restrict the freedom and creativity of a project by confining it to the existing reality of place. Applying site sketching to real design is no more a method in its own right than site sketching or the design process are. It does not involve a repeatable, predictable or prescribable set of steps or instructions. But it may instead provide a vision of how place might be changed for the better, through not only maintaining the best aspects of place, but inserting new ways in which they might be appreciated more fully, and of revealing the latent possibilities evident in the initial site-sketch. If this is achieved, then the sketch made in-situ has the potential to influence an entire design project from before its inception to its completion.

The analysis finds that travel sketching has been used to start off the design process through selecting and developing subjective ideas about place. This means that a) the design process starts in situ through direct physical perception of place; b) these sketches have been used to discover the major characteristics of place which then influence the evolution of the design; c) project and place are fused together during the design process through referring design sketches back to travel sketches throughout the evolution of the project. This serves to control and maintain the influence of place on the final project. Without directly imitating the travel sketches, the design sketches have developed out of them, adding new ideas and reworking the crucial and considered information which they contain. Although the project gradually took shape off site, the design which did happen on site was fundamental regarding the basic factors of place which served as the start point for the design and point of reference throughout the project. The travel sketches have helped to arrange all aspects of the design into correct proportion and set out the logic for the rest of the design process.

As in the drawing of the font and tree at Malagueira, sketching has helped Siza to find and isolate what he considers to be the most essential aspects of the site, regardless of relative size or immediate drama. Sketching assists him in reasoning out these fundamentally subjective decisions and in constantly developing the design in relation to place. Siza uses drawing to tackle new places which he does not already know about, unchaining a series of reflections. He always looks for fixed points to draw and anchor his designs to (Trillo, 1993) Although these design sketches show many variations, which at times depart radically from the travel sketches (such as the linear terraces), Siza's method of designing has kept referring back to what was discovered in the initial travel sketches. It is this consistency and determination to use the travel sketches to control the design's evolution that has managed to make the eventual building fit well in place. Lapuerta describes an equivalent use of sketching for designing in teams, where the sketch serves to control the development of the design process (Lapuerta, 1997). The continuous application of the travel sketches throughout the design process has given a consistent logic and disciplined unified vision of place throughout the design of the project.

Developing site sketches into design projects is a complicated and gradual process, but if achieved successfully it has the ability to link project and place in subtle yet profound ways far be-

yond superficial connections. For this to happen, intentional site sketches must be made and re-read. The ideas they suggest must be repeatedly moulded into the developing ideas of the new project, not just remaining as a start point, left long forgotten by the end of the project. The site sketch may serve as a guide at all stages of the design process, drawing new and foreign ideas into the initial interpretation of the site. This approach has the potential to generate design out of the conditions of place themselves rather than applying contextual elements later as a superficial acknowledgement of place in the project. Equally, this approach encourages local place-specific ideas to grow together with foreign ideas forming a single united approach to project and place. It also maintains the flexibility of the design process without turning the conditions of place into limiting regulations constraining the growth of the project. In this respect Siza has continued along similar lines to Aalto, demonstrating the continued relevance of place in contemporary architecture and how combining site sketching into design may connect project and place in profound, creative and innovative ways.

PART II

SUMMARY

This section has shown that travel sketching and design sketching can form part of the same continuous process if treated correctly. The common belief that travel sketching is useful to design only in so far as it develops a way of looking, thus separating travel sketching from design sketching, is seen to limit the potential that travel sketching can have to benefit the design of architecture in place. In contrast, architectural design may relate more closely to place if travel sketching is treated as an open-ended site-specific design project. Under the right circumstances, the travel sketch can become a design project in its own right - one which is not to be built directly, but whose influence may be profound, wide-ranging and long-lived. It is important to see travel sketching as a process of design in order to be more intentional and conscious of design in-situ and to change one's approach to drawing from one of attempting to observe passively to actively seeking ways to improve place with a critical and creative approach capable of intentionally combined foreign and local ideas to produce new and original readings of place. These may be directly useful for design.

This requires an intentional and methodical approach in both the travel sketch and the design process in order to achieve the most

productive results and have a positive effect on designing place. It is a question of learning through making, active research through reacting to the environment by proposing particular interpretations of place. If treated as a design of architectural ideas, rather than as a mere copy of observed reality transposed into another medium, the travel sketch has the potential to be incorporated throughout all stages of a design project. The benefit of this is that the project is connected to place from its very inception and developed in continuous relation with the human-centred experience of place.

This combines those aspects inherent to architectural sketching discussed in the previous section: Sensitivity to place, creating insightful understanding of the important underlying structures of place, and formed from real human perception; sensitive, flexible but structured use of subjective criteria resulting in creative, original ideas based on observation and organised with coherent logic; open-ended approach to time during sketching improving the integration of in-situ sketches and design sketches throughout all cycles of the design process, which may occur immediately or over the course of an extended time period.

For the architect, travel sketching – the architectural sketch made in-situ – provides a sophisticated way to learn about architectural precedent and place and the subtle relationship which connects them. It becomes a work of analysis and design rather than just a descriptive exercise. To be most productive for the architect, the travel sketch should be seen as a design project in its own right, but also as a sophisticated and sensitive way to start the design of a specific project. If given the opportunity, the influence of travel sketching can grow throughout the design process resulting in a project whose entire conception and development has been in the context of the existing place, and whose end result will transform place in a well considered way.

The following section puts these ideas into practice, using creative propositional sketching to find and develop new readings of architecture in a variety of different places.