Repertoires of Architects and Mountaineers

A Study of Two Professions

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I, Anja-Karina Nydal, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

Abstract

This thesis studies the emergence of two crafts and argues that the ways in which a craft develops into a well defined discipline with rules, principles and techniques that underpins its practice, is dependent upon an underlying quest to master it and to become a master craftsman. It will show how mastery had several different modes but also that the repertoire of techniques that forms it has the capacity to cross both historical and disciplinary boundaries.

It does so by examining two disciplines, architecture and mountaineering, and the way in which they emerged as professional practices during the sixteenth and the nineteenth centuries and also how they individually attempted to master the craft of building and the craft of climbing, respectively. The two disciplines each tell a (hi)story of attempts to master the craftsman's activity and the space within which the activity takes place but, here, the two are conjoined, not only as a metaphorical comparison but also materially through stone. Much of the content of this thesis has arisen from seeing one discipline through the eyes of another, and through weaving their (hi)stories together into one. The different modes of mastery grappled with in separate chapters represent the ways in which the disciplines were theorised, practiced, graphically and verbally described, imagined and finally how they made use of aesthetic sensibilities, with each mode of mastery being derived from an attempt to solve spatial problems.

In order to trace the identification of skills and techniques within the two disciplines, the texts investigated focus predominantly upon those books that could be defined as instruction manuals in addition to many of those that were written in the immediate lead up to the idea that practical instruction could be written. Thus the material examined stems both from narrative as well as instructional texts. Through examining these different modes of mastery, a close relationship between architecture and mountaineering, and between two different centuries, is mapped out. The texts investigated include those by Antonio di Pietro Averlino (Filarete), Sebastiano Serlio, Philibert Delorme, John Ruskin, John Ball, Alfred Wills, Frederick Burlingham, Clinton Dent, George Abraham, Geoffrey Young and Kurt Diemberger.

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Introduction

Traversing Buildings and Mountains

Background and interest

This thesis originates from a desire to understand the relationship between space as it is seen in two and three dimensions, to know what having a sense of 'mastery' of space is, and to grasp the means by which a sense of such mastery could be achieved. In conjunction with a deep fascination for two very different spatial disciplines, architecture and mountaineering, this curiosity led to questions about how these two disciplines achieved an outstanding ability to solve the spatial problems they encountered whilst engaging in their craft and thus achieve a sense of mastery over the space in which their craft took place. Furthermore, I began to wonder what range of techniques, abilities and skills they referred to in the literature and whether there was evidence of what a true body of their professional and technical repertoires were, and how they were formed. Moreover, I wondered whether a study of such aptitudes could be dissociated from a single historical period in the same way that the two disciplines were also distinctly different from one another. If so, could answers to these questions be found within each discipline's emergence as a professional practice? Consequently, the content of this thesis is historically some three centuries apart, but since their (hi)stories are woven together as one, neither their distinctly different disciplines nor historical periods seems to perturb our enquiry. Thus, this thesis is neither situated firmly in time nor in space, instead it is the material stone and the activities that surround it that brings this thesis together into a coherent whole.

For Norwegians, there is a strong bond between the mountains and ones home, and the connections between mountaineering and architecture that this thesis makes are far from accidental. After repeatedly getting lost in buildings, towns, cities as well as mountains, a curiosity around what spatial comprehension and mastery was began to take shape during my first degree. This continued as a practical project of weaving texts as a way of understanding space during my master's dissertation on architectural text and the notion that mountains and 'architecture proper'[1], the way mountains and architecture were constructed, could be written into the structure of the text. Here, construction and spatial theory were woven together as one and the first interest in the mountains as an analogy to buildings, emerged.[2] A more defined idea for a subject matter for my doctorate began to take shape after attending a lecture by the legendary Austrian mountaineer Kurt Diemberger (1932-) during the 1st International Brecon Festival of Adventure & Exploration, in 2003. Motivated by his lecture, I began reading both historical and contemporary mountaineering literature and it was whilst reading Diemberger's books that I discovered the link which later was to form the basis for my method of looking at mountaineering and architecture, and of seeing one discipline through the eyes of another.

Kurt Diemberger, the only person still alive to have made the first ascents of two eight thousand meter peaks, introduced me to a concept, which he called 'alpine geometry' in the book *Summits and Secrets* (1972). Diemberger's concept referred to how two people from different spatial disciplines and operating in different dimensions, acquired through their experiences a depth of spatial knowledge and understanding about the world of forms that led to a sense of, as he calls it, 'mastery over all planes'.

> The experience the climber and the man at the drawing board share is the same sense of freedom and power, many times multiplied: a sense of mastery over all planes, the horizontal, the vertical and all the others, but in their actual reality. A gigantic practical geometry. The climber can make the greatest objects in the world turn for his inspection, so that he is able to grasp their form, simply because he has climbed above the usual plane on to a mountain. And once he has done that, all planes are his...[3]

[1] A term borrowed from Jennifer Bloomer, *Architecture and the Text: The (S)crypts of Joyce and Piranesi.* (New Haven; London: Yale University Press, c1993.)
[2] Anja-Karina Nydal, 'Choreography of the Rain. Text as a Site for Architecture', (Kent Institute of Art and Design, 2001)
[3] Kurt Diemberger, *Omnibus: Summits and Secrets, The Endless Knot, Spirits of the Air.* (London: Bâton Wicks Publications, 1999), p. 180

What Diemberger implied was that the two disciplines both gained an understanding of all the object's planes and as such also the connections between each plane, in other words, the relationship between the object's two and three dimensions. The climber's sense of mastery, as Diemberger argues, is based upon his direct experience of all the two-dimensional planes from which the mountain gains its three-dimensional form. He suggests further that the man at the drawing board is in a comparable position to the climber, that he gains his sense of mastery through his working with the two-dimensional projections of his object and through an exchange between the object's two and three dimensions. Although Diemberger's text is not a theoretical book on the subject, it cannot be overlooked that he presents important questions which are relevant to critical discourse today, and especially to architectural discourse: one, 'the man at the drawing board', which has been pursued in great depth, and the other, 'the climber', which has not. It draws attention to these two figures, their relationships to and understanding of, space and spatial experience. It makes us question in what different ways they acquire spatial knowledge and to what extent they develop knowledge of the objects around them and the experience to solve and master spatial problems. What different methods do the two disciplines use as tools to attain this knowledge and such skills, and in what ways did they ultimately reach what Diemberger describes as a mastery over all the mountain's planes?

The short chapter from Diemberger's book, with the title 'Alpine Geometry', fired my imagination and transformed my way of thinking, firstly about mountaineering but consequently and more profoundly, my way of thinking about architecture. For almost a decade, since I attended the talk given by Diemberger in the autumn of 2003, thoughts about a relationship between architecture and mountaineering have been lingering in the back of my mind and this project is an attempt at grappling with this concept. This thesis, then, owes an enormous debt to Diemberger and his deep enthusiasm for, and life long experience of, the mountains as well as his insight into the exchanges that takes place between two and three-dimensional experiences of space. Diemberger does not explain whom his 'man at the drawing board is', and it is more likely that it refers to a cartographer rather than an architect. Nevertheless, as the relationships he describes are essentially between one who spends his time mostly climbing and one who spends his time mostly drawing, I have here interpreted the latter loosely as an architect.

Studying 'mastery'

Different disciplines have dealt with the concept of mastering space in different ways. In social psychology and humanist philosophy, the concept of 'mastery' tends to signify the means by which a human being gains a sense of meaningfulness. This is achieved through having a sense of mastery of something regardless of whether this is a productive or destructive way of gaining it.[4] In geo-political discourse the concept of 'mastering space' is closely related – and is concerned with the political tools in gaining power and control over geographical areas.[5] In art theory, 'mastery' has historically been associated with the artist or craftsman with extraordinary skills. Architecture, the discipline with the closest associations with 'space' and the 'spatial', tended to use the term 'mastery' about the building of spaces when it referred to a master craftsman or builder but not to an architect. The problem is not so much that mastering something spatial means different things, but that it in some disciplines have been much less examined and is thus much less understood than in others. Whilst psychology, philosophy and politics have a great deal of critical discourse on the subject, space and the idea of mastering it is not something that has been analysed in the way that this thesis does, neither in the history of mountaineering nor in the history of architecture.

The thread that weaves this thesis together is how these disciplines, during their emergence as professional practices, developed theories and instruction manuals as part of the process of becoming proficient in, and master, their craft and as a consequence became masters of space. It also examines those processes which were excluded from their manuals and from a formal definition of their discipline. These exclusions, which are hinted at throughout their texts provide significant clues to a range of techniques outside of those that are clearly defined in the manuals. The main body of the thesis will show, not so much what a sense of mastery of their respective crafts and spaces was, but rather the different kinds of techniques that they saw as important to employ in order to achieve this sense. The way in which the thesis is structured will show that these techniques traverse both time and space and that this crossing from one discipline to another, and between one century and another, forms a significant part of our repertoire for understanding spatial mastery, something that is not discussed, but rather demonstrated throughout the thesis.

[4] See for example Erich Fromm, *The Anatomy of Human Destructiveness*. (London: Pimlico, 1997)
[5] See for example John Pickles, *A History of Spaces, Cartographic Reason and the Geo-coded World* (London: Routledge, 2004), John Agnew, and Stuart Crobridge, *Mastering Space: Hegemony, Territory and International Political Economy*, (USA and Canada: Routledge, 1995)

The idea of mastering space and spatial activity, or having a sense of such mastery, presents us with a basic difficulty: space itself cannot be mastered, whereas a spatial activity such as a craft is often referred to as being 'mastered'. Yet in this thesis I propose that a mastery of a craft also gives the craftsman a sense of mastery over the space in which the craft takes place. Mastery could to an extent be measured in the number or difficulty of the mountains one has climbed, or it could be measured in the extent to which buildings are 'good', 'nice', 'comfortable' and so on. However, the idea of mastery will always remain a concept rather than something that is actual or in some way measurable, because, a definition of how 'difficult' or how 'good' something is, can only be judged subjectively. The idea of mastery thus needs to be studied more closely, because what more precisely is 'mastery'? To ask such a question, one cannot exclude a consideration also of what space is.

The two disciplines that developed in the 16th and 19th centuries, respectively, have many similarities in their perceptions of space and spatial activities as crafts and the ways in which these were mastered. However, there were of course a great historical and cultural divide between them and thus also between their perceptions of space and the visual technologies that either drove them or developed as a result. Denis Cosgrove argued for example that '[b]etween 1550 and 1620, Europeans experienced dramatic and unsettling changes in their capacities to conceptualize and represent space' and he explains further that '[a]pplied geometry in ballistic and triangulation in survey, use of the grid and graticule in mapping and of perspective theory and practice in drawing and painting, together with the mechanization of vision by the camera obscura and lens, fundamentally transformed European "spatialities".'[6] The nineteenth century saw equally dramatic changes, and in fact, Jonathan Crary argued that the 'transformation in the nature of visuality probably was more profound than the break that separates medieval imagery from Renaissance perspective'.[7] He argued that there was a 'rupture' which overturned classical space and that a new way of seeing space emerged as a result. For Crary, however, spatial representations such as modernist paintings and photography were indeed symptoms rather than the cause of this change. The difference, he says, lay in a fundamentally different kind of observer. Optical devices such as the stereoscope

[6] Denis Cosgrove, 'Ptolemy and Vitruvius: Spatial Representation in the Sixteenth Century Texts and Commentaries', in Antoine Picon Alessandra and Ponte (eds) *Architecture and the Sciences: Exchanging Metaphors* (New York, N.Y. : Princeton Architectural Press ; c2003. Princeton, N.J. : Princeton University School of Architecture), p. 21

[7] Jonathan Crary, *The Techniques of the Observer. On Vision and Modernity in the Nineteenth Century* (Cambridge, Mass.; London: MIT Press, c1990), p. 1

transformed their ideas of 'realism' and a fundamentally 'subjective vision' developed as a result.[8] Although the discussion in this thesis could be following these lines of enquiry, the question of what a sense of mastery consists of will be able to reveal a better understanding also of what space is without examining their differences in perceptions of space more exclusively.

Mastery is a skill, ability, or sense of accomplishment; it is a feeling of being in command of something. In this thesis mastery is associated with having unsurpassed skills in particular spatial activities. To have a sense of ones skill or accomplishment in this way depends upon having an idea of ones interpretation of triumph and success. We measure success against what others have achieved. This thesis argues that ideas of what mastery is can be examined through the literature of disciplines that were emerging as professional practices and consequently began to write instruction manuals of their crafts. Of these inherently practical disciplines, the quest to solve problems, to master a skill and to accomplish something were the driving forces. That is not to say that having a sense of mastery is all that these practical and spatial disciplines are about, this would be far too limiting an idea, but rather that it is an essential part of the way in which the disciplines engaged in, and developed, their craft, especially during a time when they sought to better define their distinctness as professional practices through the writing of instruction manuals.

A sense of mastery is particularly interesting to examine in disciplines that are on the brink of becoming a 'profession' because it is the time when an understanding of what a mastery of their craft truly means. A professional, as opposed to an amateur, shows a high degree of skill and competence in his field, one that requires extensive education or specialised training. During the process of becoming professional in this sense, an effort is made to systematise what it is they understand as being a 'master' of a craft. Instruction manuals, which essentially are bodies of knowledge about a craft, began to emerge in both disciplines, and these early attempts at a systematisation of the practitioners' skills contains intriguing evidence of what skills they believed the craftsman should have. In this way, examining the instructional manuals seems the most probable place to look for evidence of what they interpreted 'mastery' to be. However, some of the findings are quite unexpected and some of the evidence in this thesis as a result stem from that which is written in-between the lines rather than that which is directly described in distinct sections or chapters.

[8] See Jonathan Crary, *The Techniques of the Observer*, pp. 1-24

In architecture, and in any craft throughout history we are well acquainted with the notion of a 'master craftsman', and the age-old tradition of master and apprentice. In mountaineering however, this tradition only truly began in the nineteenth century when the British took to the Alps and began what we will see later being described as an apprenticeship in mountaineering. Here, the mountain guide - at least initially - was the master craftsman. The idea of a craftsman being a 'master' is based upon the idea that his skills have developed to the point of perfection, and that he is capable of instructing others. The notion of 'mastery' generally belongs to a sphere of activity, and it is this activity that the main body of this thesis will attempt to grapple with, however the sense of mastery that Diemberger described refers to space rather than activity. The difference between mastering activity and space depends upon a difference in feeling once a sense of mastery of the activity has been found. It is at this point that a sense of mastery of the space where the activity takes place emerges.

We are familiar with the phrase 'master craftsman', and expressions such as 'master of the seas', 'master of the forests' and 'master of the mountains' are also common – interpretations that have distinct mythological associations. It also draws a link to the idea of a person having skills that are superior and bordering on the supernatural and whose mastery is referred to as being of the space where the activity takes place, something that underlines one of the arguments in this thesis, that once a craft or activity is mastered, it is thus the *space* where this activity takes place that is being referred to as having been mastered. Interestingly, the 'architect' – whose title would suggest he is not a master of any space at all – is the master of built space. Nevertheless, the architect is superior to all the master craftsmen because he is the one who designs the spaces that others must build. A shift from mastering activity to that of space in Diemberger's text takes place when activities that are dominated by spatial problems are solved – of which space cannot be excluded in any part of the activity.

Terminologies

Architecture and mountaineering are both referred to in this thesis as 'crafts' and not 'arts'. This is primarily because the subject matter that links this thesis together deals with points in history where, for the two disciplines, there was less distinctness between a master and his apprentice, between the learned and the craftsman, between theory and practice. The term is thus used in order to make this difference clearer, especially

when discussing a 'craft' as opposed to something that was later systematised into a 'professional practice'. This is not to say that a craft could not also be a professional practice, but simply to make this distinctness clear throughout the thesis. It would perhaps seem fitting to change the terminology and refer to the two disciplines as 'arts' at the time when both 'crafts' were mastered and systematised, but for the sake of simplicity, the term 'craft' is used consistently throughout.

Both architecture and mountaineering are also often referred to as 'professional practices'. It could be argued that mountaineering is not a 'profession' or even 'professional' but, like architecture, mountaineering did develop a professional practice through their work as mountain-guides as early as the nineteenth century and they also earned their living from it. Being professional in this thesis does not always refer to financial gains, however, but encompasses also someone who is trained and proficient in a craft, something that better reflects the more common usage of terms such as a 'professional mountaineer'. Renaissance architecture and nineteenth century mountaineering share the way terms like 'architect' and 'mountaineer' could be dissociated from their training, and as Pevsner argued, someone who built great buildings during the Renaissance rarely were 'architects by training'.[9]

The frequent reference to the two 'crafts' or 'professional practices' as 'disciplines' reflects this 'professional' parallel as explained above, but with one important difference. Primarily it draws a distinction between the amateur and the erudite craftsman, but with 'discipline' reflecting each practice as a department of *learning*, something that is appropriate to the way their development of instruction manuals encouraged education, learning and knowledge. In this sense it is not too dissimilar to a 'professional practice', but focuses more upon the idea of 'learning', than upon the two disciplines also being an occupation. It also serves to circumvent the term 'practice' which could be confused with an 'architectural practice'.

Setting the scene

This research is based upon an architectural object and a natural object, connected through the material they are made of: stone. More specifically, the built object that is of primary focus in this thesis is Renaissance architecture, and more specifically the

[9] Nikolaus Pevsner, *An Outline of European Architecture*. (London: Penguin Books, 1953), p. 114

stone constructions in the craft of stonecutting, or stereotomy as it was later referred to as. It is crucial to the larger enquiry of this thesis to study more closely the first attempts to systematise such a craft, and the books that emerged as a result, and in architectural history it is well known that it was in France in the sixteenth century that the first attempt to do so appeared. In the natural object, the mountain, it is the activity of climbing that interests me, and what this thesis concentrates upon is those attempts that were made to systematise this craft and, again, those books that were written as a result. In mountaineering history it is recognized that Britain had a large role in this development and that it was the nineteenth century British who first introduced mountaineering as a 'sport', and who also received acclaim for writing the first proper instruction manuals on mountaineering.

French architecture in the sixteenth century was dominated by 'an invasion of Italian taste'[10] as a direct result of the influx of engravings and illustrated books from Italy during the late fifteenth century, something that was later imitated by the French. However, the architectural influence was mainly decorative, almost without changing the French forms and thus gave the buildings a kind of 'hybrid' quality at least up until 1525.[11] France during this period was a place of unprecedented change with the rediscovery of ancient arts and philosophy, as well as the rise of the role of the individual. Lyon in particular saw some major changes taking place; there were a whole range of new technical inventions and the emphasis was certainly on the role of the intellectual in developing ideas for, and inventing, the 'new'. It was in the spirit of this development that the first instruction manual on stonecutting appeared, as will be shown, in Lyon in 1567. Mario Carpo has argued that although printing 'existed officially in Geneva as early as 1478'[12] there was little evidence that it was a thriving industry there. Interestingly, in 1521 and 1522, the last book of services for the diocese was in fact published in Lyon and not in Geneva.

British mountaineering during the nineteenth century was dominated by the Imperial quest to conquer new spaces, something which in the Victorian imagination by now had expanded to the European Alps. Albert Smith's famous show, which literally brought Mont Blanc to Piccadilly, had a major influence on the way they

[10] Anthony Blunt, *Art and Architecture in France 1500-1700*, (New Haven & London: Yale University Press, 1999), p. 2
[11] Blunt, *Art and Architecture in France 1500-1700*, p. 2
[12] Mario Carpo, *Architecture in the Age of Printing. Orality, Writing, Typography, and Printed Images in the History of Architectural Theory. Images in the History of Architectural Theory* (Cambridge, Massachusetts. London, England, MIT Press, 2001), p. 79

thought about mountains. His show was amongst the latest in popular entertainment where panoramas and dioramas were combined in order to tell stories. After Smith's ascent on Mont Blanc in 1851, he returned to London with his show and *The Times* wrote for example that 'the ascent was more pleasantly performed in imagination at the Egyptian Hall than on the mountain itself'.[13] Smith's publicist announced that 'every man or woman, boy or girl, who has visited the metropolis [...] has been able to 'do' the ascent of Mont Blanc'.[14] The popularity of Smith's show was monumental, drawing over 200,000 people in its first two years and there can be little doubt that this popularity influenced the middle-class imagination and also their desire to climb mountains. Many men who had previously seen Smith's show on Piccadilly would later go to the Alps 'to experience the thrill of imperial exploration'.[15] In this way, Hansen argues, 'Albert Smith literally turned social climbers into mountain climbers.'[16]

The characters

Two characters mark the historical moments when the first proper instruction manuals of their crafts emerged: Philibert Delorme (also spelled de l'Orme and de L'Orme), famous French sixteenth century architect who was the first to attempt a systematisation of stonecutting and whose work was focused upon creating a split between the mason and architect. He is best known for his complex stone constructions, especially his squinch, or *trompe* as it most often referred to, at the Chateau Anet of which he was the most proud. Geoffrey Winthrop Young, late nineteenth to early twentieth century British mountaineer and educationist, best known for his many first ascents in the Alps and for his manual of mountaineering technique. At times, Young, and mountaineering in general, features perhaps more in this thesis than Delorme, but at other times Delorme more than Young and this is because the thesis attempts to understanding aspects of architecture through the

[13] Peter Hansen,'Albert Smith, the Alpine Club, and the invention of Mountaineering in Mid-Victorian Britain', *The Journal of British Studies*, 3, 34 (1995) p. 305
[14] Hansen, 'Albert Smith, the Alpine Club, and the invention of Mountaineering in Mid-Victorian Britain', p. 305
[15] Hansen, 'Albert Smith, the Alpine Club, and the invention of Mountaineering in Mid-Victorian Britain', p. 314
[16] Hansen, 'Albert Smith, the Alpine Club, and the invention of Mountaineering in Mid-Victorian Britain', p. 309

discipline of mountaineering and aspects of mountaineering through the eyes of architecture – that is - by reading one discipline through the eyes of another. In mountaineering we are fortunate enough to have a large number of writers from which to draw upon, thus, alongside Geoffrey Winthrop Young, other primary texts examined in the discipline are those of Alfred Wills, Leslie Stephen, John Tyndall, Clinton Thomas Dent, Owen Glynne Jones, George D. Abraham and Frederick Burlingham, all of whom either attempted to systematise mountaineering or write more generally about the techniques of climbing. These writers preceded Young in their attempts at systematising their craft, although not very successfully, and thus Young is the first to produce an instructional manual in mountaineering that fulfils all the expectations of such a text. All of these writers therefore have something important to add to the discussion.

As for Delorme and stonecutting however, prior to Delorme there were no examples of similar attempts at creating a systematic theory of this craft, except the 13th century book by Villard de Honnecourt, and although precious, this book contained only two drawings about stereotomy.[17] The Roman and Gothic periods had been a 'quasi desert' of sources, as Sakarovitch calls it, but in the sixteenth century there were some Spanish manuscripts that dealt with the topic of stonecutting, such as those by Alonso de Vandelvira, Ginés Martínez de Aranda, Alonso de Guardia and Hernán Ruiz. However, the access to this material was restricted both geographically and linguistically, and thus for stonecutting the material here has been limited to Delorme's treatise, whose two books on stonecutting an unofficial translation exists in whole, and other official translations exists in parts. However, since stonecutting was part of the larger discipline of architecture, and because there was no distinct boundary between a master mason and an architect during Delorme's time, other Renaissance authors on architecture such as Leon Battista Alberti, Filippo Brunelleschi, Antonio di Pietro Averlino (Filarete), Sebastiano Serlio and Andrea Palladio will also be drawn upon.

What this thesis attempts to show is how all of these writers, the architects as well as the mountaineers, were engaged in spatial activities through building or climbing as well as being observers and critics of space, at a time when changes were

[17] Joël Sakarovitch, 'Stereotomy, a Multifaceted Technique' in *Proceedings of the First International Congress on Construction History*, (January 2003), p. 72

occurring. It will show that they were all involved in documenting - if not driving - the shifts that took place during the development of their professional practices.

The texts

Two texts that documented this shift were Young's *Mountain Craft* (1920) and Delorme's *Le Premier Tome de l'Architecture* (1567). Young's book, a manual of mountaineering, was written during the early part of the twentieth century as a result of – and encouragement by Arnold Lunn to the publishers[18] – that the earlier Badminton volume on mountaineering by Clinton Thomas Dent from 1892 was out of date. Delorme's book, in part a traditional Renaissance treatise of architecture, but also the first instructional manual in the craft of stonecutting – Books III and IV. What is most immediately evident in looking at the two types of texts, side by side, is the ways in which the two texts are structured and the type of information that each author considers important. An overview of their contents will thus now illustrate their likenesses.

Young's book is divided into nineteen chapters, and it is useful here to look briefly at what more precisely the contents of these were. Chapter one: 'Management and Leadership', chapter two: 'Equipment for the Alps', chapter three: 'Guided and Guideless Mountaineering', chapter four: 'Rock Climbing', chapter five: 'Climbing in Combination', chapter six: 'Corrective Climbing', chapter seven: 'Ice and Snow Craft', chapter eight: 'Reconnoitring', chapter nine: 'Mountaineering On Ski', chapter ten: 'Mountain Photography', chapter eleven: 'Mountaineering in Tropical Countries', chapter twelve: 'Mountaineering in the Arctic (Spitsbergen)', chapter thirteen: 'The Caucasus', chapter fourteen: 'The Mountains of Corsica', chapter fifteen: 'The Himalaya', chapter sixteen: 'The Mountains of Norway', chapter seventeen: 'The Southern Alps of New Zealand', chapter eighteen: 'The Pyrenees', and chapter nineteen: 'The Rocky Mountains'.

In comparison, Delorme's treatise contained nine 'books', but each book does not have a title, only many sub-chapters, which are too many to list here. Nevertheless we can subtract from the treatise that book one and two contain introductory considerations for the general conditions of building (such as the choice of site, the

[18] Arnold Lunn, 'Geoffrey Winthrop Young', in *Alpine Journal*, Volume 66 (Nos 302 and 303) 1961, p. 111

building's orientation, the choice of materials, etc.) and the architect's status. Books three and four describe the stonemasons tools and instructs the methods for drawing and cutting stones of different basic parts of a building, beginning with the foundations and doorways for cellars as well as stone structures, such as vaults, squinches (or trompes) and staircases. Book five tackles decoration using the Tuscan, Doric and Ionic orders. Book six is solely assigned to the Corinthian order, and Book seven is concerned with various ways in which to make new and original orders as well as to solve the problem of the French order. Books eight and nine examine different types of openings such as doors, windows and fireplaces. In a later edition of his treatise, two more books were added, ten and eleven, which contained the two books originally published in his *Nouuelles Inuentiones* (1561).

The structure, order and content of Delorme and Young's texts share many similarities; each author considers, for example, towards the beginning of their texts (chapter one in Young and book two in Delorme) the status of the practitioner – and to use Young's term their 'management and leadership' skills. Young's chapter two on equipment is mirroring Delorme's description of tools in his book three. Young's chapters four-seven and nine examines different styles or methods of climbing; whether it is rock climbing, climbing in combination (roped together), how to avoid and corrects climbing mistakes, climbing on different surfaces such as snow and ice, and lastly ski mountaineering. These books reflect the majority of what Delorme presented throughout books three and four, which deal in detail with different types and methods of cutting, ranging from basic cuts for doorways to more difficult cuts such as squinches, or trompes. Chapter eleven-nineteen in Young's book, which deal with mountaineering in various mountain regions across the world, and which invariably examines their different types, and gives a topographic overview and a summary of the ways in which they differ in climate and culture from the European Alps. This has undoubtedly many links with Delorme's books five-nine, which considers different architectural orders, and gives a broad survey of their different stylistic types.

This thesis will concentrate mainly upon the connections between Delorme's books three and four and Young's chapter four-seven, and nine, because it is here that different processes and methods for both discipline's activities unfolded as instructional types of manuals – and it is also that which distinguishes both texts. It will also examine the evidence within Delorme's book three and four of what Young is

discussing in his chapters eight and ten on the role of vision and graphic descriptions although Delorme does not devote a separate book in his treatise for this subject alone.

The chapters

What types of techniques, then, did the two disciplines use in order to attempt to master their craft? The six chapters in this thesis represent those methods which formed their repertoire of techniques, and the subject matter of each chapter represents in this way a different mode of mastery: through *theory, practice, graphic and verbal description, thought and aesthetic*. Although presented individually, the thesis works in three parts, with each chapter working together in pairs: the first part grappling with the differences between a theoretical and practical understanding, the second part with different kinds of information about space and spatial activity that graphic and verbal description separately provide, whereas the third part considers aspects of mastery that are not dealt with systematically in any of the texts, but that nevertheless formed a large part of their discussions about technique: the ability to reason and to make aesthetic judgement. Each chapter represents different stages in theories of learning, and could be ordered differently depending on the individual's approach to learning.

Chapter one, on *theory*, introduces us to the methodology that persists throughout this whole project: of seeing one discipline through the eyes of another. More specifically, it will examine the historical evidence of how, and why, the two crafts developed bodies of rules, principles and techniques into instruction manuals, the theoretical underpinnings of their craft. It asks what evidence we can find in the literature of their attitude towards theory and as a result also what these will reveal about what thoughts they had around what theory could, and could not, teach. Geoffrey Winthrop Young and Philibert Delorme's texts show how the development of theories coincided with the emergence of their discipline as professional practices and thus also a redefinition of their disciplines and how the idea of theoretical mastery was received.

Having looked at how practice was theorised, chapter two, on *practice,* takes a step back and examines the role that practical experience had in their quest to master a craft. The chapter seeks to answer what importance practical, as opposed to theoretical, experience had. It asks what it means to 'measure' space and spatial activity and what role practical experience had in their ability to perceive and judge

different measures. The texts will show what it is that defines practical experience, and thus also the kinds of 'instruments' that were used to measure. By using William Ivins' theory of geometry it draws out an essential difference between two ways of measuring that both disciplines relied on. The texts examined show the effect that the development of theories now had on their understanding of practical experience.

Chapter three, on *graphic description*, examines how sketching, drawing, painting and photography were used as techniques to analyse space and spatial activity. It asks in what different ways these descriptions were used to analyse the mountain or the building as *spaces* and how this differs from how graphic descriptions were used to represent climbing and building as *activities*. The chapter seeks to answer what role these graphic descriptions had in teaching an 'alphabet' of a visual language - and whilst for the sixteenth century architect it was essentially drawings that were used, in nineteenth and early twentieth century mountaineering it was photography that came to dominate the field.

The role of *verbal descriptions* is discussed in chapter four. It examines the ways in which verbal descriptions were used in combination with drawings, or alone, in providing the information necessary about the space or the activity. Verbal descriptions here focus on the written word as a literary device as opposed to the written word as a theoretical device, although the two are naturally linked. It examines the role of language in processes of learning and asks what verbal descriptions can do that graphic descriptions cannot. It will also examine the evidence within the texts of their position towards language as a mechanism in mastering their craft.

Thinking is the subject of chapter five, which examines the role of cognitive techniques such as visualisation, abstraction and imagination. It looks at the evidence within the two disciplines texts of how these techniques were used and in what way they contributed as techniques to master their space and spatial activity. The chapter takes into account visualisation skills such as 'blindness' and 'mental rotations'. In their instruction manuals these skills appeared only randomly within the text that formed the body of work within them, but it is my intention to show that they deserve to receive singular attention as techniques in their own right in this chapter.

Chapter six studies the role of *aesthetics* and asks how aesthetic pleasure can form an important part of the two disciplines repertoire of techniques. We will see how aesthetic concerns compare with functional concerns. It will attempt to understand different kinds of aesthetic pleasure, how something 'difficult' and 'unhomely' can be a

device to stimulate learning and also to what extent aesthetic motivations drove their activities. We will see how these pleasures are primarily cognitive pleasures and how aesthetic understanding arise from thought and reasoning as opposed to immediate sensory experiences. This chapter thus completes the circle of the repertoire of techniques that the two disciplines used.

Limitations and contributions

It is inevitable that a thesis which attempts to weave together such greatly different disciplines and historical periods will also have limitations. The topic of this thesis and the method of seeing one discipline through the eyes of another means that the thesis will necessarily have large gaps because it cannot attempt to consider each historical period and discipline in full in the space that this thesis provides. This means that at times, the reader is left with many questions about how something particular in one discipline applies to the other. However, it is not the intention of this thesis to write two parallel histories, but rather weave two histories together into one, where as many questions are asked as answered. Nevertheless, this method is also my contribution to knowledge – that by seeing two disciplines through the eyes of one another – a new way of reading and learning about the history of art and crafts can emerge.

Note:

All references to Philibert Delorme's treatise are quoted both as the page numbers from his original treatise as well as from Sergio Sanabria's translation, thus all footnotes will look like the following: fol. 50r/p. 129, 'fol. 50r' referring to Delorme's treatise and 'p. 129' referring to Sanabria's text.

1

Theorising Stone Crafts

Mastering Techniques Through Written Theories

We established in the introduction that the two disciplines architecture and mountaineering both seek to find ways in which to master their craft and the space within which their craft took place. We saw that there are six major techniques they employed in the attempt to do so; the first through theory, the second through practice, third and fourth: graphic and verbal description, fifth: through thought and lastly the notion that mastery culminated in an aesthetic sensibility.

To address the first point of convergence between the two disciplines architecture and mountaineering this chapter will examine what role *written theory* had for the practitioners of these two disciplines. It will analyse the development of written theory, their views on theory and thus how theory was seen as a way in which to master their spatial activities and thus gain a sense of mastery of the two spaces, the building and the mountain, respectively. Developing a sense of mastery of a spatial activity and its techniques through the written language involved an ability to formulate spatial and geometrical concepts through the written word. Theories of both discipline's activities did exist, and to some extent have always existed, prior to books being written on the subjects, but these earlier theories or bodies of rules, principles and techniques revealed themselves only through built architecture[19] and climbed mountains, and not through written text.

[19] Hanno-Walter Kruft, *A History of Architectural Theory From Vitruvius to the Present*. (New York and London: Princeton Architectural Press, 1994), pp. 13-19

Theory in the form of principles and rules of spatial activities such as climbing and building depended on a new type of writing: the instructional manuals and handbooks. Therefore, in order to examine written theory in this sense, we have to look at the nature of these writings as well as the history of their development. By investigating their views on theory and the underlying processes of gaining a sense of mastery through written theories in the two disciplines, this first chapter will introduce us also to the methodology for this whole project; that of seeing one through the other. The protagonists for this chapter, and for this project as a whole, are the sixteenth century French architect Philibert Delorme (1514-1570) and the British late nineteenth century to early twentieth century poet, educator and mountaineer Geoffrey Winthrop Young (1876-1958).

One part of this chapter will examine Philibert Delorme's treatise *Le Premier Tome de l'Architecture* (1567), and more specifically his two books on stonecutting, or stereotomy,[20] within his treatise. This is in order to see a historical fragment in the development of written theory as a system of principles and rules in the instructional text that existed in the architectural profession during the sixteenth century and thus to get a better understanding of theory's role for the then emerging modern architect. In Delorme's treatise, we will see how he distinguishes between theoretical and practical methods of solving spatial and geometrical problems, both of which he believed an architect should master, in order to be a true and proper architect. However, we will also see how Delorme battled with the idea that theory should have a dominant role in the emergence of an 'architect', in the modern sense of the word, and what role theory had in his text and what this meant for the development of a mastery of a craft. Finally, we should then be able to see what role theory had in serving to generate the architect's sense of mastery of his spatial enterprise: the building.

The other part will examine the development of theory and the technical manual in the discipline of mountaineering, and in particular two texts that were considered to be the first amongst climbing literature to be within a genre we would call 'technical' or 'instructional' writing. These two texts are firstly Geoffrey Winthrop Young's *Mountain Craft* which was published in 1920, because as Peter Hansen, historian of British mountaineering in the nineteenth century, pointed out; 'some

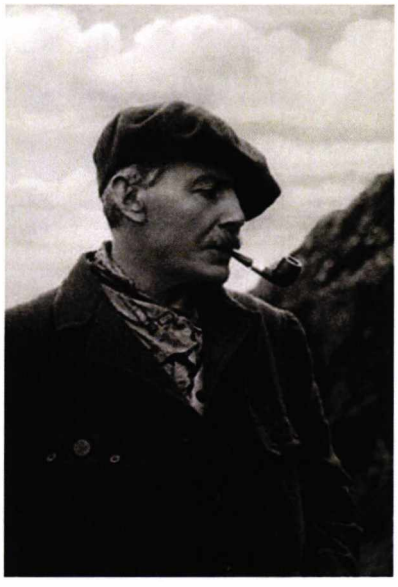
[20] Stereotomy is the art and science of cutting stones into geometrical shapes as well as their orthogonal projections.

might identify Young's book as the first technical manual'[21] on mountaineering, but also Clinton Dent's book *Mountaineering* from 1892 which he identified as 'an earlier example of the same kind'.[22] During the early part of the nineteenth century, there were no technical books on climbing, but in between the mid- to late part of the century a properly theoretical approach to the mountain took shape, and this developed into the first 'how to climb' books at the end of the nineteenth and beginning of the twentieth century. Furthermore, this chapter will therefore also look at mountaineering texts from the mid nineteenth century to trace the conception and birth of the mountaineer-as-practitioner to the mountaineer-as-theoretician.

In order to understand how this is all connected, the two parts described above will not be discussed separately but will as far as possible be weaved together as one, so as to make the arguments more clear.

Theory: a mutual endeavour

1 Philibert Delorme



2 Geoffrey Winthrop Young

What Philibert Delorme, born in Lyon in 1514, and Geoffrey Winthrop Young, born in London in 1876, had in common was a quest to formulate, in writing, a body of

[21] Peter Hansen, email correspondence, 22 February 2009
[22] Peter Hansen, email correspondence, 22 February 2009

rules, principles and techniques that underpinned their spatial activities – their stone crafts. What distinguishes both authors from their predecessors, as we will see further on, is that they developed theories in order to attempt a formulation of some *laws* of their craft, rather than rely upon general speculation and opinion. What is meant by *theory* in this chapter is nevertheless a more universal understanding of the term, we could say that it is 'a hypothesis that has been confirmed or established by observation or experiment, [...] [and that it is] a statement of what are held to be the general laws, principles, or causes of something known or observed.'[23] Importantly, it is theory held as general rather than absolute laws, but what was it, more precisely, that the two authors were developing theories of?

Philibert Delorme attempted to systematise the stonecutter's craft, Geoffrey Winthrop Young, the mountaineer's. The craft of cutting stones into shapes consists of several processes that could be divided roughly into four parts: first, the ability to produce the drawings that create the templates for the cutting of the stones, second, the ability to transfer these templates to the stones to be cut, and third, be able to cut the stones and fourth, then assemble them correctly into built constructions. The craft of mountaineering (or climbing) is based upon, roughly, being able to identify the best line of ascent and furthermore be able to negotiate a wide range of obstacles and problems met with on that route in order to climb to the summit. To make a generalisation about the two crafts, one could say that one of the most distinct features that they have in common is a negotiation of the ways in which different surfaces, lines and points relate to each other. These relationships suggest that the activities they are engaged in, although 'spatial' would define them well, the kinds of problems both activities are faced with are, in a way, more like geometrical problems.

Theory taught through instruction manuals is knowledge based upon learning the principles and rules of something through written language and thus also abstract concepts. However, if theory is integral to mastering spatial or geometrical problems, we must begin by asking what geometry is, and then proceed further by asking how geometry and theory are related. The *Oxford English Dictionary* informs us that geometry was historically known as 'the art or science of measuring land' and that it is also known as 'the spatial arrangement of objects', but what is more related to this thesis

[23] See entry for 'theory, *n.1*', §4a, in Oxford English Dictionary Online <http://dictionary.oed.com> [accessed 15 April 2012].

perhaps is how geometry, as a 'branch of mathematics [is] concerned with the properties and relations of points, lines, surfaces, and solids'.[24]

As seen in the passage quoted from Diemberger's text in the introduction to this thesis, by his use of the words to 'grasp the form' of something, it was understood that a direct and haptic grasp of things was necessary in order for the climber to achieve a sense of mastery of the mountain. However, Diemberger also suggested in his text that 'the man at the drawing board' achieves this same sense of mastery through his work in the two-dimensional plane. Geometry in the first example is what William Ivins would call 'metric geometry',[25] in the second example what he would call 'projective geometry'. Robin Evans, in grappling with Ivins' ideas, explains that

> metrical geometry is a geometry of touch (haptic) because congruity of figures is assessed by whether they feel the same when put together, while projective geometry is a geometry of vision (optic) because congruity is assessed by whether they look the same from a given standpoint.[26]

Evans stated further that it is essentially these two geometries that have been of particular interest to architectural discourse and, it could be argued, also to mountaineering discourse. As Evans pointed out, neither of these definitions are entirely correct but they provide a good indication of their differences. Nevertheless, touch and vision are useful ways to distinguish between two of the most obvious methods that the two disciplines used in attempting to master their space, although several others are also dealt with in this thesis.

Since geometry is defined through spatial properties and how they relate to each other, space is therefore by necessity geometrical. We can, then, attempt to keep a definition of the term geometry in its simplest form, as that which relates to the relationship between spatial properties. Geometry can then be used as a tool to understand a more complex inquiry around Diemberger's notion of 'mastery over all planes' in the disciplines architecture and mountaineering, because a mastering of 'planes', which involves this distinct spatial property, is therefore also a mastery of geometry. Theory is thus related to geometry in the way that spatial problems, such as the relationship of one spatial property to another are resolved through a systematic

[24] See entry for 'geometry, *n.*', §1a, in *Oxford English Dictionary Online* <http://dictionary.oed.com> [accessed 15 April 2012].
[25] See William M. Ivins, *Art & Geometry. A Study in Space Intuitions* (Cambridge: Harvard University Press, 2003)
[26] Evans, *The Projective Cast, Architecture and Its Three Geometries.* (Cambridge, Mass: MIT Press, c.1995), p. xxxiii

study of these problems, although a reference to 'geometry' is rarely recorded in the written texts. Therefore, the theories, which are guides to finding solutions to the problematic of such spatial relationships, could be said to be a 'theoretical geometry'.

Before Geoffrey Winthrop Young's *Mountain Craft* there was Clinton Dent's *Mountaineering* (1892), but before Dent's book no properly written theory of climbing existed which involved a detailed and systematic study of the principles of climbing, and before Delorme's *Le Premier Tome de l'Architecture* (of which there was no Deuxième Tome) there was no written theory of stonecutting. Except perhaps Villard de Honnecourt's famous thirteenth century sketchbook, which features some stonecutting drawings, clearly in a very early attempt to theorise the craft. There were many books on architecture however, but these theories were not systematising a method, but rather a style, as we will see. The following will begin to explain what written theory was prior to the writing of Delorme and Young's books.

Changing attitudes towards technique: the birth of theory

The Renaissance is well known for its many architectural treatises; amongst some that are especially well known are those by Leon Battista Alberti, Sebastiano Serlio and Andrea Palladio. It has been argued[27] that late Renaissance treatises were not so much about theory as they were about graphic presentation, in the form of drawings, of the ancient classical Orders, the critical object of interest during this time. The treatises were therefore limited to presenting, graphically, the classical orders and their measurements,[28] and James Ackermann, accordingly, identified the architect of the high renaissance as 'anti-theoretical'[29] and maintained that the architects were suspicious of theoretical principles and consciously avoided the written word.[30] That is

[27] See for example James Ackerman, *Distance Points. Essays in Theory and Renaissance Art and Architecture.* (USA: MIT Press, 1991) Geoffrey Scott, *The Architecture of Humanism. A Study in the History of Taste.* (New York; London: Norton, W.W. Norton & Co., 1974) Catherine Wilkinson, 'The New Professionalism in the Renaissance', Spiro Kostof, *The Architect. Chapters in the History of the Profession.* (Berkeley; London: University of California Press, 2000) Wylie Sypher, *Four Stages of the Renaissance Style: Transformations in Art and Literature 1400-1700.* (Gloucester, Massachusetts: Peter Smith, 1978) and Blunt, *Art and Architecture in France 1500-1700*

[28] See, for instance, Jean Guillaume, 'On Philibert De l'Orme: A Treatise Transcending the Rules'. Vaughan Hart, and Peter Hicks, *Paper Palaces: The Rise of the Renaissance Architectural Treatise.* (New Haven and London: Yale University Press, 1998), p. 219. Kruft, *A History of Architectural Theory From Vitruvius to the Present*, p. 73. Scott, *The Architecture of Humanism. A Study in the History of Taste*, p. 40 and Ackermann, *Distance Points*, p. 376

[29] Ackerman, *Distance Points*, p. 376

[30] Ackerman, *Distance Points*, p. 378

to say that the Renaissance architects did not produce theories, but that they were simply accepting the existing rules and principles, or theories as it were, from the ancient texts such as those derived from Vitruvius.

For this reason, Geoffrey Scott claimed that the Renaissance in fact had no need for written theory because the architects concentrated mainly on 'taste'.[31] This meant that 'taste' was distinct from 'theory' in the sense that the Renaissance did not question the ancient theories of taste, but simply re-produced them. Ackermann sheds further light on the situation by illustrating the events during the late Renaissance and argues that if theory had indeed been valued, the architects of this later period would have studied the writings by Leon Battista Alberti, Antonio di Pietro Averlino (1400-1469), generally known as 'Filarete' and Francesco di Giorgio (1439-1502). This is, Ackermann argues, because all three of them were architectural theorists who published some of the most important treatises during this time,[32] and anyone remotely interested in architectural theory would therefore have studied them. This however, 'they manifestly did not do',[33] he continues. The most noticeable disciple of this later, non-theoretical (in a written, rather than oral, sense of the word) tradition was Sebastiano Serlio because the chapters in his treatise bear more resemblance to a visual type of compendia rather than a theoretical treatise.[34]

Unlike the architects of the late Renaissance however, the late nineteenth century mountaineers and climbers did not avoid the written word. That is not to say that these writers immediately developed a theory of the craft of climbing, but before Young's *Mountain Craft* was published in 1920, there were a large number of climbing books that attempted to verbally describe various aspects of the mountain itself, or of the act of climbing the mountain, as well as to provide 'good advice' to the readers of their books; the future mountain climbers. Until the Badminton Library of Sports and Pastimes published volume 16 on mountaineering[35] in 1892 however, none of these books could be defined as theoretical in any systematic sense of the word, nor did they consist of a body of rules or methods for solving spatial problems whilst climbing a mountain. In other words, there were lots of written text, but an absence of a system.

[31] Scott, *The Architecture of Humanism. A Study in the History of Taste*, p. 40
[32] Leon Battista Alberti is best known for his *De Re Aedificatoria* or *Ten Books of Architecture*, 1452. Antonio di Pietro Averlino, or 'Filarete' for his *Libro Architettonico*, 1464 followed by Francesco di Giorgio for his *Trattato di Architettura*, 1482
[33] Ackerman, *Distance Points*, p. 363
[34] Ackerman, *Distance Points*, p. 363
[35] Clinton Thomas Dent, *Mountaineering... With Contributions by... W.M Conway, D.W Freshfield...* (London; Bombay: Longmans, Green & Co., 1892)

This was precisely the object behind the Badminton Library's many volumes, to have a collection of books:

> to which the inexperienced man, who sought guidance in the practice of the various British sports and pastimes, could turn for information.[36]

Instead, the earlier books were rather verbal descriptions of travels that kept a detailed record of the events on their journeys into, and up, the mountains. In these texts, one would often, and with regular recurrence, discover in between the thoughts and records of events some important and interesting observations on how to become a better climber, a few simple principles and even some detailed descriptions of techniques, but the latter was the exception rather than the norm. The nineteenth century clearly valued these written accounts, something which is evident in the vast number of them that were published during this period, but it was to take over a century of regularly published mountaineering literature before a book dedicated exclusively to the body of techniques and rules that applied to climbing in practice, was to be published.

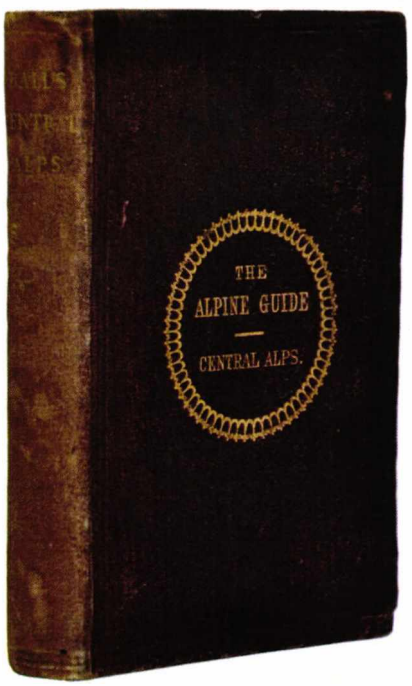
The nineteenth century mountaineering literature was consistent with the development in architecture during the Renaissance in that neither discipline had previously focused on a systematisation of technique in writing. The early architectural treatises presented the basic principles of building, defined types of houses, argued that all buildings should be based upon human proportions, studied of the buildings of classical antiquity and their Orders and the ways in which Vitruvius' principles could be applied to contemporary building practise. However, they did not produce any text that was focused on the methods by which the spatial and geometrical problems of their building craft could be solved: an instruction manual with descriptions and explanations of the techniques of, for example, the stonecutters methods for the drawing and cutting of stones. These methods were, in the early Renaissance, much guarded knowledge by the medieval craft guilds – and were as such separate from their idea of what 'architecture' was and thus also excluded from the architectural treatises.

What happened in France notably with Philibert Delorme in the sixteenth century was an attempt at breaking with this past, and we see a properly theoretical approach to architecture and to *technique* in Delorme's first text to be published on

[36] Dent, *Mountaineering*, p. vii

stonecutting and to the methods of production for architectural stone-constructions, which had historically been a long kept secret of the guilds. Written theories, or bodies of knowledge, presenting systematic rules and principles behind their relationship with the material stone began to emerge in both disciplines.

From the onset of mountaineering in the middle of the eighteenth century and with the prolific number of published mountaineering books that followed in the nineteenth century - the literature, despite their popularity, lacked completely such systematic methods from which the technical aspects of mountaineering could improve. The literature, focusing instead on topographical guidebooks such as those published by John Ball, the first president of the Alpine Club and editor of the well known *Peaks, Passes and Glaciers* series (1859) as well as the *Guide Books to the Alps* series (first editions 1863, 1864, 1868), rarely attempted to be a handbook on what climbing was and least of all be a guide on *how to climb*; a techniques guide in other words, until the end of the nineteenth and the beginning of the twentieth century with the publication of the Badminton Library's *Mountaineering* by Clinton Dent (1892), *The Complete Mountaineer*, by George D. Abraham (1908) and Geoffrey Winthrop Young's *Mountain Craft* (1920).



3 John Ball's *The Alpine Guide – Central Alps*, 1873

Between the publication of Ball's guidebooks and Young's techniques guide, there was a prolific number of books published that fell into the more general category of travel writing, but this definition is rather loose since there were many of these writers that attempted to provide instruction and give more attention to the technical skills needed to become a successful mountaineer. These attempts at giving technical instruction does not, however, take priority within the main body of the texts but appears instead as random advice in between the sequences of events within their narration of ascents in the Alps. Surprisingly, however, these observations that are of a more technical nature does not appear in any of the dedicated sections of 'hints to travellers' or 'hints for pedestrians', as these chapters often were called.[37]

As Jill Neate, author of many recent climbing guidebooks, as well as a bibliography of historical and contemporary mountaineering literature published in English, wrote:

> a practicable definition of a 'mountaineering book' continues to elude me.[38]

This suggests that a link between the practice of climbing and the idea of technique had not yet been formed, thus the possibility of a more systematic study and understanding of the principles that underpinned their techniques had not yet been recognised. Spatial problem solving techniques was then, at the time, something climbers pursued in practice, but it was not something they were aware of as 'technique' and thus needing a theoretical foundation. The recognition of their skills and techniques and the identification of climbing as a set of spatial problems that could be systematised evolved only very slowly over the course of the nineteenth century. The following will show what these chapters of 'hints' contained, as well as the technical aspects that the later twentieth century reader would have expected to find.

Delorme's treatise differs from these early climbing books as well as from the Renaissance treatises in that he devoted large parts of his book, half of it in fact, to 'technical matters'.[39] His primary concern was to systematise the craft of stonecutting into a written theory where all these technical matters were recorded for the future use of craftsmen for whom, 'without any doubt, nothing will appear which one cannot

[37] See for example the chapter *Hints for Pedestrians* in Alfred Wills, *Wanderings Among The High Alps.* (London: Richard Bentley, New Burlingham Street, 1856), pp. 316-347
[38] Jill Neate, *Mountaineering Literature: A Bibliography of Material Published in English.* (London: The Mountaineers Books, 1987), p. 8
[39] Guillaume, 'On Philibert De l'Orme: A Treatise Transcending the Rules', p. 221

gallantly do'[40], or in other words, who with the help of theory could now solve *any* problem. Delorme's greatest wish, it seems from his treatise, was to solve every conceivable problem and also to prove wrong those who believed many of his more fanciful constructions would be impossible to construct. He writes that the possibilities indeed are unlimited:

> They are mistaken because there is nothing that cannot be done and well adapted by those who understand and are well versed in the art.[41]

As Jean Guillaume has remarked, Delorme did not spend time perfecting the existing methods of his time, but instead spent his time establishing new ways of building roofs and vaults.[42] This is indeed typical of the change that took place in Europe during Delorme's lifetime, when the architects' focus started to shift from simply reproducing the styles and buildings from classical antiquity to instead be interested in the technological progress that occurred during this time. This resulted in the realisation that there were new and exciting possibilities to be found within the construction industry; and as such we see Delorme's obsession with inventing new solutions to the older problems. As a result of this and the new engineering processes that were used, what now begins to appear more regularly is the use of technical drawings alongside these first technical treatises throughout Europe.

Wolfgang Lefèvre has argued that with the development of more advanced technologies during the sixteenth century - the traditional methods of passing on knowledge, such as apprenticeships and journeymen's travels were no longer sufficient.[43] The new self powered saw mills, lifting devices, water pumps and devices for mixing lime, to mention a few, were examples of these latest technologies. In the spirit of these innovative developments, Delorme focused his attention mostly on his new inventions as he announces repeatedly throughout his treatise, using drawings and texts to describe these and their new methods of production. His treatise, then, was one of the first of its kind to make the previous methods of learning, that of 'learning by doing', redundant.

In the mountaineering literature several centuries later, a development took place that shared that which took place during Delorme's time, and in his treatise. It did not make apprenticeships or the methods of learning through experience

[40] Philibert Delorme, *Le Premier Tome de l'Architecture.* (Paris: Fédéric Morel, 1567), fol. 59r/p. 148
[41] Delorme, *Le Premier Tome de l'Architecture*, fol. 67v/p. 166
[42] Guillaume, 'On Philibert De l'Orme: A Treatise Transcending the Rules', p. 221
[43] Wolfgang Lefèvre, *Picturing Machines 1400-1700* (Cambridge, Mass.; London: MIT Press, 2004), p. 3

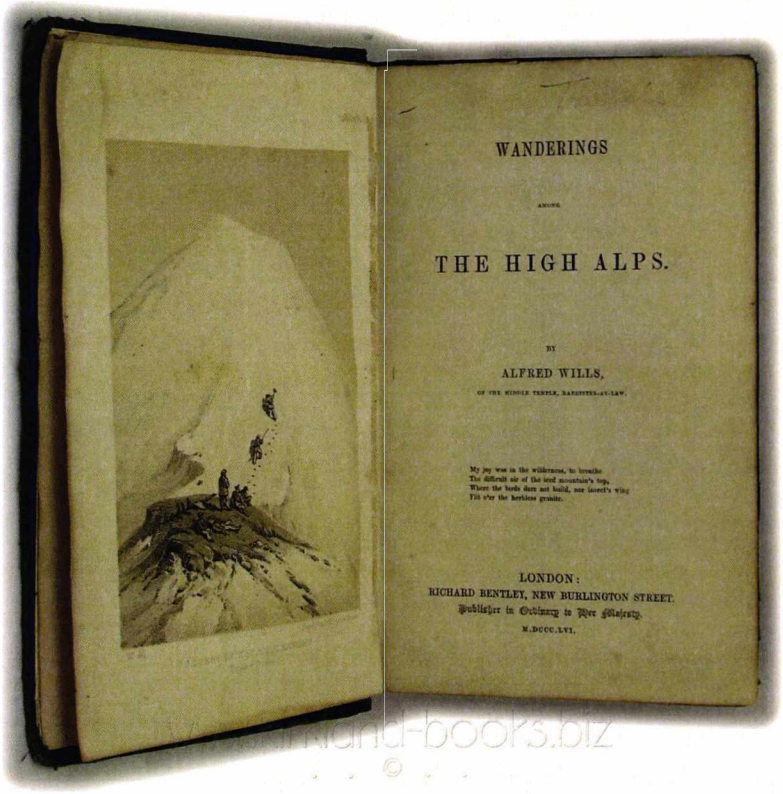
redundant, but we do see a significant effort in their attempt at writing more instructional climbing literature that focused upon learning through systematic methods that were explained in the written texts. In *Wanderings Among the High Alps*, Alfred Wills, mountaineer and third president of the Alpine Club, makes an early attempt at writing a text that is more instructional in nature. Accordingly, he writes in the introduction that he has tried to make his own experience 'practically useful to the pedestrian'.[44] However, towards the end of the book in the chapter intended for such practical advice, called 'Hints for Pedestrians',[45] Wills attempts to provide his readers with precisely such 'hints', but his verbal descriptions never actually enter into any technical details. Instead, the instructional chapter in Will's book provides the reader only with some relatively casual observations about the types of clothes that are suitable for mountaineering, it discusses the swift change in weather and the possibilities of danger that it may bring and provides some advice on particular tools that would be useful.

Alfred Wills' use of the term 'pedestrians', rather than mountaineers, is perhaps telling of his position. Thus, the reader finds that only the alpenstock, telescope and compass are mentioned as useful tools, suggesting instead a relationship to the mountain that is more observational, than technical, and certainly not with any kind of system in mind. The fact that Wills refers to the mountaineer as a 'pedestrian', suggests that he is referring to someone who has the pleasures of walking rather than actually climbing a mountain. Wills was amongst those (and he was not alone) of the nineteenth century alpine tourists who visited the mountains in order to enjoy a mountain 'walk', simply a stroll amongst beautiful scenery. This is especially evident in the following remark that Wills makes in his book that a:

> telescope, a compass, and a book for pressing flowers have been mentioned as pleasant additions to the necessary outfit.[46]

Wills' mountain seems to be a place for experiencing aesthetic pleasure and walking in the mountains, for him, did not seem to need many of the technical explanations we see in later literature, hence the more practical and technical advice was simply ignored.

[44] Wills, *Wanderings Among The High Alps*, p. vii
[45] Wills, *Wanderings Among The High Alps*, pp. 316-347
[46] Wills, *Wanderings Among The High Alps*, p. 317



4 Will, Alfred. *Wanderings Among the High Alps* (1856)

One of the reasons for the slow development of a body of principles and techniques, a written theory, seemed to be that the general public did not value this type of literature in a sport that many still saw as being too great a risk to the climber's lives to accept it as a 'sport'. Frederick Burlingham's account of *How to Become an Alpinist*, published almost 70 years after Alfred Wills' book, shows how the author felt that he had to justify his efforts in attempting to provide practical and technical advice in a more systematic manner than earlier books. He writes that

> there is a way to climb the most difficult without diminishing the pleasure and with the minimum amount of danger. Is not this knowledge worthwhile?[47]

But why was the idea of disseminating this knowledge questioned? What is evident in this passage is that there must have been a sharp distinction between the public perception of literature that related to experiences of the mountain as an aesthetic source of pleasure, which as we saw Wills describe above, and the kinds of literature

[47] Frederick Burlingham, *How to Become an Alpinist* (London: T. Werner Laurie Ltd., 1912), p. 8

that had at its core *danger*. It seems that books associated with pleasure, as opposed to danger, were thus consequently more socially acceptable. Any technical and practical advice therefore seems to have been associated with the dangers that mountaineering were continuously faced with and it is likely that Burlingham for this reason felt the need to justify the writing of his book in this way.

Because of this, Burlingham attempts to associate his book with the experience of pleasure and the idea that climbing difficult and thus dangerous mountains also could be a pleasurable experience. Hence, he writes that there is 'a way to climb [...] without diminishing the pleasure' and that this 'way to climb' would ensure that neither pleasure nor safety would be compromised. Although there is not enough space here to examine this question in more detail, the knowledge that Burlingham sought was systematic techniques, and the question of its value in the public eye is an intriguing one. Nevertheless, Burlingham's question creates expectations that, finally, there *is* a book that challenges the lack of proper instruction and systematic theory in the earlier literature, but the content of his book is disappointing. Although the book's title bears resemblance to an instructional type of manual, it does in actual fact provide little more than the mountaineering books we saw from the previous century. He writes, wisely, that the 'theory of alpinism comes not by asking questions, but by observation',[48] but Burlingham's text offers very little such observations. The most promising of the chapters in his book, called Equipment and Training, provides some information on suitable clothes for climbing and the kinds of tools that are necessary but, like Alfred Wills' book above, it offers insufficient and inadequate advice to be, in any way, called 'instructional' and thus would have been of little practical use for the budding mountaineers and readers.

Although Alfred Wills' *Wanderings Among The High Alps* (1856) and Frederick Burlingham's *How to Become an Alpinist* (1912) were written almost 70 years apart, both texts belong to a rather loosely defined literary genre, as we saw the contemporary author Jill Neate make observations about previously. I would like to suggest, although there is not enough space here to discuss it further, that this loosely defined genre was strongly connected to the simultaneously loose definition of the term 'mountaineer'. During the nineteenth century, what a mountaineer was varied widely in the literature and although Frederick Pollock, in the first chapter of Badminton Library's *Mountaineering*, wrote that 'Mountaineering, as the term has been used and understood

[48] Burlingham, *How to Become an Alpinist*, p. 29

for about a generation, is not the same as mountain travelling',[49] the literature suggests that mountaineering had not yet formed its own set of characteristics that belonged uniquely to it until the publication of this book. When Pollock marked the year 1851 as the turning point between the 'old fashioned narratives' of mountaineering as seen through the eyes of Albert Smith, and the 'modern period of mountaineering',[50] this presumably also meant that the modern literature demonstrated a new understanding of what mountaineering was. Nevertheless, the amount of space in the chapter that Pollock uses in order to highlight the difference between mountain travelling and mountaineering suggests that a definition of a mountaineer was still relatively loose until the end of the nineteenth century when the difference between narrative and instructional literature was better defined.

Accordingly, between Pollock's marker-year 1851 and the publication of Badminton Library's *Mountaineering* in 1892, there must have also been a radical change in their consciousness around the kinds of *skills* that a mountaineer needed. Thus, in 1907 we see the publication of George D. Abraham's *The Complete Mountaineer*, in 1912 Frederick Burlingham's *How to Become an Alpinist*, and finally culminating in Geoffrey Winthrop Young's *Mountain Craft* in 1920 – and this last book was arguably the first proper instructional manual of mountaineering with the most comprehensive and systematic set of principles and rules in the history of mountaineering. These books including many of those written from Pollock's marker-year represents those that most distinctly drove the shifts that took place in the mountaineering literature as a genre, and thus also directly influenced what kinds of skills that were expected of the mountain guides as well as of those calling themselves 'mountaineers'. Descriptive travel writings were, of course, still continuing to be published during this time, but books that were wholly dedicated to providing practical knowledge and technical instruction created a strongly defined genre and the difference between narrative and instructional texts became clear.

Although the development on the mountaineering scene was comparable to the kind of trade secrets of the guilds before Delorme's time, and that became public knowledge for the first time with the publication of Delorme's *Le Premier Tome de l'Architecture* in 1567, in mountaineering, the knowledge and skills that the mountaineers had, were not formally recognised as being anything in the sense of the

[49] Pollock in Dent, *Mountaineering*, p. 1
[50] Pollock in Dent, *Mountaineering*, pp. 4-5

trade secrets that Delorme was grappling with during his time. Nevertheless it was certainly a knowledge that in the early period was very little known except by some very few and experienced chamois hunters and mountain guides. With the interests of the intellectual aristocracy, the members of the Alpine Club, a new literary genre began to take shape and slowly a definition of the city-dweller now roaming the mountains: the mountaineer, formed and what followed was an understanding that the climber's techniques should be better explained and defined in instructional texts. This was indeed a breakthrough in that theory disseminated through the written text could not only instruct and teach the methods of climbing, but because they were based on a systematic study of principles there was an expectation that this system had the capacity to improve its techniques.

The formation of these systematic theories, then, was very slow partly because there was a public rejection of literature that focused upon the dangers in mountaineering, whereas in architecture it was partly because technique was not seen as being of a concern that needed pinning down in writing for architects. This was a sign that both disciplines, and the term 'mountaineer' and 'architect', lacked distinct definitions in their respective historical times. It was also a reflection on two disciplines that both were on the turning point between being a craft whose knowledge were known only by a very limited number of people and intentionally withheld from general knowledge, and a craft whose knowledge was generally known, at the very least, in abstract theory. This knowledge was kept by each craft's master practitioner: the mountain guide and master mason, but both crafts' previously withheld knowledge was now about to be uncovered through the work of the apprentices, those amateurs who with time working under the skilled masters developed more analytical skills about the craft and thus eventually developed the systematic theories of both professions that now were published as instruction manuals.

The value of theory

With the bodies of rules, principles and techniques that emerged in both disciplines as written theory, it is important to now ask what value the architects and mountaineers placed upon these theories that we have seen they developed. With the level of efforts that were invested in writing these theories, we should thus be able to assume that both disciplines saw theory as an essential part in gaining a sense of mastery of their craft

and in becoming a master practitioner. Nevertheless, as we will see, their position towards theory was not without its difficulties and challenges. Whilst we saw above that systematic theories about each discipline were being developed into bodies of knowledge recorded in written text, we will therefore now also see how this birth of theory changed. It was not only the value that was placed upon theory itself that changed, but the expectations that consequently were placed upon the practitioner of each discipline. When previously the architect and the mountaineer had relied on their practical skills learned through long apprenticeships, many of the same skills could now be learned much more rapidly through the study of their craft's principles as they were presented in the texts. Accordingly, there was now a growing expectation that a stonecutter or a mountaineer should be able to master their disciplines faster and thus also be able to climb higher or find better design solutions as a result of studying their craft through theory. The surfacing of these written theories along with the consciousness about the value of theory led perhaps also to the disciplines and practitioners being better defined. What follows will place the two disciplines' positions on the role of theory as a way of conveying the necessary knowledge and instruction in order to master their craft.

> George Abraham stated in his classic book *The Complete Mountaineer* that a
>
> systematic study of rock-climbing was then [in the pioneering days of climbing] scarcely thought of.[51]

Accordingly, there are very few direct references to draw upon in the earliest climbing literature as evidence of how theory, or to use Abraham's words, a 'systematic study' of climbing, was perceived. The lack of these references also makes it difficult to ascertain whether or not, like Delorme viewed his stonecutter, theoretical knowledge was seen to be indispensable in the pursuit of becoming a mountaineer proper. However, the fact that theories did develop and the evidence within the literature of such a development can nevertheless provide a fascinating insight into the way the literature changed and what kinds of techniques that gradually found its way into these books. It also gives an understanding of what their thoughts on theory was whilst it was being produced. In order to ascertain whether the development of a systematic examination of a craft that resulted in written theory was historically specific, examining Delorme's view on theory and whether it differed from Dent and Young, becomes important.

[51] George D. Abraham, *The Complete Mountaineer*, (London: Methuen & Co., 1907), p. 46

Alfred Wills stated in the introduction to Clinton Dent's book that to

> precipitate the subtle essence of thoughts, actions and habits which have become instinctive, and crystallise it into language is no easy task.[52]

Wills was, like Young, very aware that the written word alone could not teach a man to climb, but he hoped that his efforts to 'enunciate some axioms of the craft',[53] would be able to provide the climbers with some knowledge of the basic system of climbing, at least in its abstract terms. Further on in his text, it becomes increasingly clear that Wills in actual fact had a very strong belief in the written word and in the systematic study of climbing. In his own words:

> Even experts may correct faults; and he must have great good fortune or little modesty – or both – who can learn nothing from the experience of others and from the precision which the very effort at system imposes upon a writer.[54]

By using the word 'axiom' Wills suggests that he saw climbing, not only as a system of propositions, but that also in some way climbing, a practice-based discipline, had an underlying set of principles that could be systematised. It is interesting that he uses the word axiom, because, even if only metaphorically, it has some connection with geometry. An axiom is an assumed structure of a system, but you cannot prove it. They are effectively assumptions. In Euclidean geometry, for example, parallel lines do not meet, and this is a generally understood axiom, but the assumption cannot be proven. What Wills presumably meant when he used this word, was that climbing was based on common sense, and in his text, he moves between something that can be proven and something that cannot. What Wills appears to be doing, then, is to present to the reader a few basic principles and propositions, the scaffolding as it were, upon which mountaineering is built, but also the idea that some of these principles were provable, or at least Wills may have thought they were demonstrably true.

In mountaineering, the climber negotiates, without interruption, spatial and geometrical problems continuously whilst climbing the mountains. As we saw at the start of this chapter, he is concerned with the points, lines, angles, curves, surfaces and solids of the mountain as well as these elements' relationship to each other, the geometry of the mountain. In order to have success on the climb the climber must

[52] Wills in Dent, *Mountaineering*, p. xviii
[53] Wills in Dent, *Mountaineering*, p. xviii
[54] Wills in Dent, *Mountaineering*, p. xviii

understand how, for example, the point relates to the line and the line to the angle of the rock and to judge these spatial relationships wrong may have catastrophic results. We understand, then, that climbers must by necessity learn some of the 'axioms' that Wills discussed in order to problem-solve the geometries of the space. However, as Wills stated above, the climber's understanding of his space 'may have become instinctive'[55] and his judgements are therefore not based upon the systematic reasoning that a theory of climbing may provide. However, no theory had yet been written about these relationships, and as Wills stated; to explain these relationships that previously only had been intuited, into words, was indeed a hard task to pursue, one that required a lot of effort in order to accomplish.

Philibert Delorme, often taken to be the first Frenchman to receive status as architect in our modern sense of the word,[56] emphasised in his treatise that anyone who wanted to receive the title 'architect' had to have knowledge of theory or, as he says, of letters and other disciplines such as geometry and arithmetic. Delorme's standpoint was well positioned within the established classical views that an architect had to master these disciplines as abstract theory before being seen as capable of the design and execution of a building, something agreed upon by contemporary historians of architecture.[57] These views on theory are evident in the earlier European treatises, but especially in the ancient text by Vitruvius, whom Delorme refers to frequently throughout his treatise. Delorme's position on theory and its role in defining the professional architect, then, seems coherent. The 'practical' in Delorme's treatise is dismissed, because the architects and stonecutters should first and foremost be proficient in the theories, or the bodies of knowledge, belonging to his discipline, a theoretical approach to the geometries of his space. Consequently we find much evidence, especially in Books III and IV on stonecutting, that Delorme wanted architects and stonecutters to learn disciplines such as geometry. He repeatedly claimed throughout the treatise that anyone engaged with the cutting of stone needed to master the theory of geometry in order to understand the cuts, or 'traits' as Delorme called them, of a stone as well as its orthogonal projections.

[55] Wills in Dent, *Mountaineering*, p. xviii
[56] Anthony Blunt, *Philibert de l'Orme.* (London: A. Zwemmer Ltd., 1958), p. 2
[57] See for example Leopold Ettlinger, '*The Emergence of the Italian Architect during the Fifteenth Century*'. Kostof, *The Architect. Chapters in the History of the Profession*, p. 98

5 Frontispiece of *Le Premier Tome de l'Architecture,* 1567

Delorme therefore believed that a mastery of geometry in theory was necessary in order to be able to follow the instructions and execute the cutting of the stones as well as understand the drawings. His wish for training in theoretical geometry, then, became an obsession in his *Le Premier Tome de l'Architecture.*[58] In Book III, Chapter VI, he said for example that those who already knew the theory of geometry would have a significant advantage in the practice of stonecutting:

> I will freely say that this discipline, knowledge and artifice of cuts [...] cannot be acquired lightly [...] Those who already have Geometry in hand will have much advantage seeing as they will be somewhat instructed and introduced to the practice.[59]

It is important here to clarify that 'geometry' for Delorme implied the theoretical learning, an abstract theory, behind those practical methods of working that stonecutter's engaged in every day. Theory and geometry in Delorme's treatise are thus almost synonymous, because a stonecutter's 'geometry' was the theory of his craft.

[58] Delorme, *Le Premier Tome de l'Architecture*, fol. 73. Sergio Luis Sanabria also pointed this out in *The Evolution and Late Transformation of the Gothic Mensuration System.* (Doctoral Thesis: Princeton University, 1984), p. 197 that 'De l'Orme's concern for the dissemination of geometric knowledge is quite obsessive.'
[59] Delorme, *Le Premier Tome de l'Architecture*, fol. 61v/p. 153

In his treatise, although the writing of Books III and IV clearly demonstrated that a systematic theory of stonecutting, to him was important, Delorme does not often explain *why* learning through written theory had the significance that he emphasised throughout his work. It therefore seems appropriate to here borrow from Wills' passage the idea that everyone, even experts, should learn from the precision that a system imposes.[60] In this context, and for Delorme, this meant that the application of the tasks of stonecutting would have more systematic and precise methods from which to help the reader to learn to draw and apply the drawings to the cutting of stones. In this way, one has a system in place that one can fall back on when instinct alone fail, as Wills described, and it should therefore have less room for error. For Delorme, this system inevitably gave way to the possibility of designing more advanced shapes, or in mountaineering, more advanced climbing routes. The development of both disciplines was consistent with the technological growth across Europe within both the building industry and the climbing activities during both the sixteenth and the nineteenth centuries.[61]

Delorme's text suggests that he was discouraged by the lack of interest that the stoneworkers showed towards any form of theoretical appreciation and understanding of their craft. If the workers had studied the written theories, he stated, the workers would be able to construct just about anything. However, Delorme continues that

> it is precisely here that I must raise my complaint, because today I do not see many workers making the effort to study and know that which concerns their estate.[62]

Instead, Delorme writes, they 'entertain themselves with a heap of worldly and frivolous things which do not pertain to their vocation'.[63] Delorme, in his quest to teach a more systematic theory of stonecutting, was provoked by this lack of interest and it is thus clear that Delorme, both personally and professionally, attached enormous importance to the theoretical learning of stonecutting. He continues that Books III and IV on stonecutting had in fact been written for these uneducated workers, and he does not hesitate to make the point that this indeed meant 'the majority' of workers. 'I would fraternally advice, admonish and beg', Delorme

[60] Wills in Dent, *Mountaineering*, p. xviii
[61] See for example Lefèvre, *Picturing Machines* for an architectural account of this.
[62] Delorme, *Le Premier Tome de l'Architecture*, fol. 57v/p. 145
[63] Delorme, *Le Premier Tome de l'Architecture*, fol. 57v/p. 145

continues, 'to recognize that which is required and necessary'.[64] To the modern reader, it seems rather strange that Delorme should openly 'beg' the workers to recognise the importance of a theoretical way of learning, and yet we see in a number of places throughout his treatise frequent reference to such expressions by Delorme, something that gives his treatise a rather more personal style than most architectural treatises during this time.

Turning again to the climbing literature: the passage below from Young's book demonstrates the views within the wider climbing communities, from the end of the nineteenth century to the beginning of the twentieth, of the importance of theory:

> Mountain craft, the mastery of the laws that govern ice and rock and of their application, has become an exact science, and the educated intelligence, under the right guidance is able in a season or so to enter upon a whole inheritance of knowledge, of detail and principle, which it took decades of tentative experiment to discover.[65]

For Delorme, however, a development of a theory of stonecutting, the equivalent of what Young calls 'tentative experiments' above, took more than Young's 'decades' to discover and not until the seventeenth and eighteenth centuries did stonecutting become a relatively exact science. Delorme wanted urgently to see stonecutting become an exact science, and although he did not manage to write the two books on stonecutting with a system of principles organised in any way like an exact science, it was nevertheless the first of the architectural treatises that attempted to do so.

In many ways Delorme's treatise made significant progress in this direction, but he did not succeed in dividing the different types of problems into groups, a set of organising principles, of which there were universally applicable rules. Instead, what Delorme's two books on stonecutting in actual fact managed to achieve was a description of each individual problem in detail. That is not to say that what Delorme did was any less important in his time, but perhaps the most important contribution by the theory that Delorme managed to accomplish was, in Alfred Wills' words above, a handing over of 'a whole inheritance of knowledge' in a relatively short period of time. Delorme writes in Book III that trompes

> of any shape can be found by means of the very methods of cuts you will see next, which allows a great savings and gain of time, study and

[64] Delorme, *Le Premier Tome de l'Architecture*, fol. 57v/p. 145
[65] Geoffrey Winthrop Young, *Mountain Craft*, (New York: Charles Scribner's & Sons, 1920), p. 105

> labor to those who know its practice, as I can testify, who learned it with very great labor in my youth.[66]

The new methods that Delorme wanted to share in his treatise, although perhaps not as systematic as Delorme thought they were, would nevertheless be a swifter way for the art of stonecutting and for the architectural profession as a whole to learn new techniques and to improve.

The mountaineer Clinton Dent also commented upon the rate at which the craft could now be learned in his book *Above the Snowline*: 'the apprenticeship served in the mountains was then much longer than it is now'.[67] This is another indication that the mountaineering discipline during the late nineteenth century was seeing an almost identical development to what stonecutting and the architectural profession as a whole did, in the early- to mid-sixteenth century. Delorme contributed to the profession becoming more exact, stones were cut with a precision not previously seen and this in turn effected a transformation in the kinds of shapes they were now able to produce, and the architectural constructions they were able to build. As the mountaineer Alfred Wills proposed above when he used the word 'axiom', there was a growing understanding within the mountaineering community that a system also existed for mountain crafts and that climbing therefore could become more technically advanced and that, consequently, increasingly more difficult mountains could be climbed.

Although Young wrote the first proper instructional manual of mountaineering, in the opening lines of his book *Mountain Craft* it becomes apparent that there was a conflicting correlation between the book he had produced and his expressions of scepticism in the use that his book, and other mountaineering handbooks of the same kind, had. Young felt that a systematic presentation of the techniques in written *theory* would always be second rate to practical experience. Accordingly, he wrote in the preface to his book that

> I do not myself attach much value to mountaineering handbooks: an open-air pursuit can only be taught by practical attempt and from good example.[68]

This is a startling statement to open the first proper technical manual on mountaineering with, but further on Young writes something that enlightens his

[66] Delorme, *Le Premier Tome de l'Architecture*, fol. 89v-90r/p. 210
[67] Clinton Thomas Dent, *Above the Snowline. Mountaineering Sketches Between 1870 and 1880* (London: Longmans, Green & Co, 1885), p. 6
[68] Young, *Mountain Craft*, Charles Scribner's & Sons, p. vii

position in this respect. Comparing mountaineering handbooks with the learning of Chinese, he writes that he would nevertheless set himself to learn the language if it meant that it would enable him to better understand 'one more record of genuine mountain adventure or discover some unfamiliar attitude of the human mind towards the mountains and their symbolism'.[69] He continues that some 'men are born climbers. They will learn little about climbing from precepts'.[70] Nevertheless, Young believed that books like his own must have had *some* value, something the following passage makes clear:

> many of the finest climbers fall short of our ideal of safe method because they have never concerned themselves with the possible existence of any fundamental principles governing the various unrelated movements in which they delight [...][71].

Like Delorme, then, Young felt that it was nevertheless necessary to learn the principles of their craft in theory, because as Wills wrote earlier, climbers relied mostly upon instinct,[72] but because some principles cannot be learned from practical experience alone, mistakes were made which Wills thought would be avoidable had the theoretical principles of climbing been learnt. In climbing, a mistake compromises not only the safety and life of the climber himself but also of everyone else in his party. It was indeed for these climbers Young wrote that his book had been written, and he hoped that his book, which explained the underlying principles of 'all correct climbing motions', therefore, would not be 'entirely useless'.[73]

However, there is another value that both disciplines placed upon theory that have not yet been discussed, and it is something that, although fairly obvious, is well worth a brief look at – that is the value of safety. In what way did the issue of safety affect the development of learning principles and systematic methods in theory? In the introduction to Clinton Dent's *Mountaineering*, Wills wrote that a mountain 'incautiously approached or ignorantly dallied with' might become, not the 'playground of Europe' that Leslie Stephen had previously imagined,[74] but instead a field of death.[75] Wills' assertion was directed at those climbers who showed little caution and respect for the mountain, but it also implied that learning theory was a

[69] Young, *Mountain Craft*, Charles Scribner's & Sons, p. vii
[70] Young, *Mountain Craft*, Charles Scribner's & Sons, p. viii
[71] Young, *Mountain Craft*, Charles Scribner's & Sons, p. vii
[72] Wills in Dent, *Mountaineering*, p. xviii
[73] Young, *Mountain Craft*, Methuen and Co., Ltd., p. v
[74] See Leslie Stephen, *The Playground of Europe*, (London: Longmans, Green & Co, 1871)
[75] Wills in Dent, *Mountaineering*, p. xix

way in which the climber could develop a better awareness and thus give the respect that such an environment required. Apart from falling rocks and bad weather, Wills writes, there are few things that 'care and knowledge will not eliminate'.[76] This 'knowledge' refers indeed to written theory and it does receive as much emphasis here as what we saw Delorme place within his treatise. With this theoretical type of knowledge, it provided the possibilities of a craft to develop into a professional discipline. Abraham writes in the preface to his *Complete Mountaineer* that a friend, who had read the manuscript to his book, suggested this alternative to the title: 'How not to break your neck on the mountains, by one who has tried it.'[77] The concern with safety in these theoretical writings is again followed up by Young's idea of 'safe methods'[78] that he discusses in the preface to his *Mountain Craft*, something that was predominantly gained from the theoretical study of the safe methods of climbing.

There is therefore little doubt that these technical volumes about the craft of climbing, which appeared in 1892, 1907 and 1920, by Dent, Abraham and Young respectively, had as their primary aim to demonstrate that this theoretical knowledge was necessary to acquire before attempting to climb a mountain,[79] and would eliminate many of the mountain's dangers and as a consequence also the number of deaths. The early-mid nineteenth century climbers had seen an increase in climbing's popularity and accordingly also an increase in the number of deaths that occurred on the mountains. An article in *The Times* stated for example about an attempt to summit Mont Blanc in 1850 that 'Crowds assembled to witness their start, as the hazardous nature of the adventure was well known, the guides having left their watches and little valuables behind, and the two gentlemen made their wills and prepared for the worst.'[80] Nevertheless, deliberately seeking out risk and danger was, by the end of the mid-nineteenth century, morally desirable.[81] However, after the initial period of rejecting the sport of mountaineering because of the dangers it involved, as well as a dismissal of all literature related to it as we saw earlier, safety on the mountain indeed became one of the most valued contributions of this new type of literature.

[76] Wills in Dent, *Mountaineering*, p. xx
[77] Abraham, *The Complete Mountaineer*, p. vii-viii
[78] Young, *Mountain Craft*, Methuen and Co. Ltd., p. v
[79] Wills in Dent, *Mountaineering*, p. xx
[80] Derwent Coleridge, 'Ascent Of Mont Blanc', in *The Times*, (London: Monday, Sep 09, 1850) p. 6 in *The Times Digital Archive* <www.galegroup.com> [Accessed 22 July 2012]
[81] Simon Thompson, *Unjustifiable Risk? The Story of British Climbing* (Milnthorpe: Cicerone, 2010), p. 23

Delorme, it seemed, had no such motive although the issue of safety naturally must have been just as important for him as it was the mountaineer's, but he rarely mentions theory's value in providing information about safer construction techniques. Instead, it seems that he preferred to develop new inventions and techniques for their own sake. Stonecutting was perhaps not as dangerous a craft as climbing, and certainly it was not in danger of suddenly being made illegal for the reasons we saw above during nineteenth century mountaineering. One can nevertheless detect some concern within the two books with the safety aspects of the stone constructions and we can draw the conclusion that, to an extent, Delorme like all architects had to take into account the safety of his constructions. He writes accordingly that due to

> the great span and width of these doorways, and the great weight of masonry they uphold above, the rear-arches cannot be made flat and square without danger of damage by the great load, which will break the mortar of the joints and often cause stones to fall.[82]

It is clear throughout the treatise that safety was not Delorme's primary motivation for writing his theory of stonecutting, but that by necessity it had to be considered due to the very real risks that were involved.

One is tempted then, despite Delorme's lack of apparent references to the matter, to suggest that safety was at least as one of Delorme's reasons to advocate the learning of theory. One reason for this is that, unlike the stones that fall in mountains, stones that fall in buildings are not caused by chance but by human failure, and this was certainly something that Delorme and architects generally would have been interested in eliminating. Delorme stated numerous times throughout his treatise that if one understood the theory of geometry 'nothing will appear which one cannot gallantly do',[83] something which is comparable to Alfred Wills who wrote that with the exception of falling rocks and bad weather there were few things that 'care and knowledge' would not be able to eradicate.[84] With the application of abstract theory onto practice, nothing would seem too difficult, no problem too hard to solve and the dangers of falling stones in both disciplines could be avoided. Although falling stones was an unavoidable fact in mountaineering, having knowledge of the most likely circumstances when stones could fall, would thus reduce the likelihood of a climber being on a route when the stones may strike.

[82] Delorme, *Le Premier Tome de l'Architecture*, fol. 64r/p. 158
[83] Delorme, *Le Premier Tome de l'Architecture*, fol. 59r/p. 148
[84] Wills in Dent, *Mountaineering*, p. xx

Throughout Delorme's entire treatise, we find a repetitive, almost obsessive, habit of applying increasingly forceful arguments to his readers of the importance of studying the theory of stonecutting. In the mountaineering literature by Dent and Young however, despite stark warnings issued in the introductions to their books, an attempt to persuade the readers to learn the written theory of climbing does rarely go beyond these first few pages, nor does it spill out into the main body of their books. However, what we have seen in both these professions through Delorme, Dent and Young's writings, is a similarly persistent belief that learning a craft through written theory is an invaluable contribution to each of their craft's practitioners. Firstly to avoid possible dangers, but also to improve the practice itself with faster technical progress, creating more advanced constructions in architecture and more advanced climbing routes in mountaineering, and this in turn gave each profession a new pride in their work. Importantly for our discussion here, this value placed upon written theory does not depend entirely upon particular historical events, as these authors of some three to four hundred years apart show. Rather, within the progressive development of a craft, perhaps any craft, we find the same type of condition of attempting to be effective, and it is this that pulls each practitioner in the direction of a written theory.

Theory's effect on master and apprentice

To be amongst the very first in their time and discipline to attempt to write and publish a body of rules, principles and techniques, a comprehensive written theory, had many challenges. It was clear from the previous discussion that both Philibert Delorme and Geoffrey Winthrop Young had a number of reservations about theory and its value. In what follows a better idea of the kinds of problems and challenges that this new way of learning a craft had for the relationships between the masters and their apprentices, will be shown. The relationships are complex, and there is only enough space here to outline some of these in this chapter.

Young, as we saw above, wrote that he did not see much value in mountaineering handbooks but that he nevertheless hoped that his instructional book would not be 'entirely useless'.[85] It is indeed very surprising that Young would

[85] Young, *Mountain Craft*, Charles Scribner's & Sons, p. viii

express such a fundamentally pessimistic observation on his own effort to compile and write a comprehensive and systematic book with the principles of climbing. However, as his book was the first of its kind in the mountaineering literature to cover such a broad and in depth study of a range of practical topics, it seems that the author simply did not have confidence in whether his efforts in creating a written theory would give the rewards he may have hoped for. We see also in Delorme's treatise a hesitation about theory akin to Young's above: 'those who are not of the art and make the effort to read what I have written and look at the figures of the cuts may learn something thereby',[86] he writes. Both Delorme and Young's passages, then, suggests that although they both aspired to teach the fundamental principles of their crafts in theory, there was a presence in their texts of something that could be described as disappointment. The awareness that theoretical knowledge disseminated through the written text was problematic and riddled with challenges, may have contributed towards this. Although both disciplines valued theory highly for all the possibilities it created, as we saw previously, this probing into the real value of theory thus also persisted to create repeated justifications for writing it.

It seems at first very clear in Delorme's treatise that written theory and instruction was perceived as the ultimate way to progress in architecture generally, as well as in the art of stonecutting. However, on a closer reading of his treatise it becomes increasingly clearer that he had a number of hesitations about whether written theory could, in fact, convey practical knowledge and whether or not theory could provide the craftsmen, as well as his architects, with the means by which to draw and build. There is therefore a hesitation in his treatise about the kind of knowledge he believed that architects and stonecutters should have. At times, Delorme makes it sound as if learning depended entirely upon written theory, that it was the foundation upon which everything else was built. At other times, it is clear that written theory meant significantly less to him than learning the principles and techniques that applied to architecture, and to stonecutting more specifically, through practical experience. That is, applied theory, an examination of the theoretical subject through actual experiments. However, one of Delorme's principal concerns within his treatise was to establish better-defined roles and clearer boundaries between architects and masons, roles that according to Delorme should be divided consistently around whether they had theoretical or practical knowledge of stonecutting.

[86] Delorme, *Le Premier Tome de l'Architecture*, fol. 61v/p. 153

Delorme thus begins his treatise by articulating his frustration with the lack of clearly defined boundaries between the two:

> Hence we must certainly believe that most of those who claim to be architects should be called master masons since some just wanted to train in manual work, without any concern for the knowledge of letters and disciplines [...].[87]

It seems as if Delorme's view on the significance of letters, or written theory, for the architectural profession was uncomplicated and straightforward. As he writes, those architects who were more concerned with manual work than with theory should instead call themselves master masons. Without knowing architecture in theory, he suggests, one should in fact not be granted the title as architect at all and that, as a consequence of this, those who already used the title should suffer a loss of their status and instead receive the lower rank as a mason. Correspondingly, this change that came about between the architect and the masons in the architectural profession, also began to appear in the relationship between the master and his apprentice in the discipline of mountaineering.

In the mountaineering books by Edward Whymper, an illustrator and climber during the late nineteenth century, the relationship between master and apprentice makes frequent appearance. Whymper's appraisal of this significant connection that existed between the two represented what, I argue, was a trend in the late nineteenth century literature of attempting to establish a better-defined role of the mountaineer. Importantly, to establish each role's responsibilities was also integral to the development of the role of theory. Theory provided the foundation upon which the mountain guide was seen as distinct from his apprentice and the architect from his mason. Without theory, that is, an abstract knowledge of their craft, there would be no basis from which to make the distinction. Whymper writes that, in order to learn the craft of climbing, one needs several seasons of apprenticeship with what he calls the 'masters of their craft' - the mountain guides. The mountain guide was, Whymper explains, a master craftsman, but it is clear that this 'master' was not someone who trained by studying written theories. Instead, it was apprentices such as the likes of Geoffrey Winthrop Young, and others before him, such as Clinton Thomas Dent and George D. Abraham, who later came to study and write a theory of the craft.

[87] Delorme, *Le Premier Tome de l'Architecture*, fol. 1v (translation Elie Harfouche)

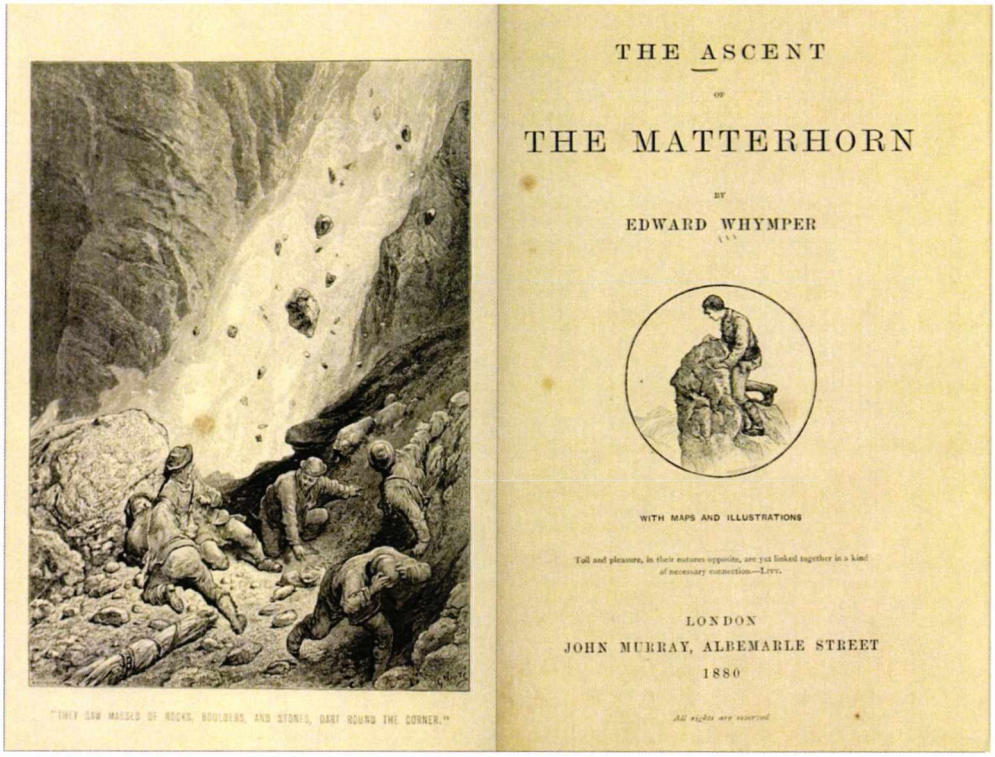
What Whymper thus conveys is the idea that the master of a craft was based upon experientially learned knowledge, and this was an influential idea which we find evidence of in that the first proper instructional books on mountaineering often had a title with either the word 'craft', or 'craftsmanship', terms that have survived until the present day.[88] Through Whymper's descriptions of the master craftsman, it could be argued that he effectively created a more defined idea of what a mountaineer was, but it must be asked whom, more precisely, was this definition suitable for? Writers both prior to and after Whymper rarely find a use for these particular terms, 'master' and 'apprentice', however, that is not to say that the discussion of theory and the relationships between these two figures in the other books did not exist, but simply that it previously was not connected to the two terms. Instead, the terms they used most frequently were 'mountaineer' and 'guide'.

In the climbing accounts during the nineteenth century, the mountaineers often conveyed great respect and admiration for their mountain guide's skills, although until Whymper they were not referred to as 'masters' of a craft, but instead as 'mountain guides' or as 'true mountaineers'. Whymper, who introduced the idea that they were masters of a craft in his book *The Ascent of the Matterhorn*, defined thus a discipline that should receive the same esteem and respect that craftsmen of other arts had earned, both of which required a mastery of spatial enterprises. In his passage below he explains his own apprenticeship with these skilled professionals, the master craftsmen:

> My scrambles amongst the Alps were a sort of apprenticeship in the art of mountaineering, and they were, for the most part, carried out in the company of men who were masters of their crafts. In any art the learner, who wishes to do good work, does well to associate himself with master workmen, and I attribute much of the success which is recorded in this volume to my having been frequently under the guidance of the best mountaineers of the time.[89]

The true master of the craft was, for Whymper, the mountain guide - a man guided by practical experience and not by the theoretical study of climbing. Interestingly, however, and despite the author's obvious high regard for the mountain guides and their skills, he makes in the book a very distinct difference between himself and his guide.

[88] See for example Eric Langmuir, *Mountaincraft and Leadership*, (Edinburgh: Scottish Mountaineering Council, c.1984)
[89] Edward Whymper, *The Ascent of the Matterhorn*, (London: John Murray, 1880), p. vi



6 Title page of Whymper's *The Ascent of the Matterhorn*, 1880

This distinction between master and apprentice that Whymper makes in his book, and that is evident throughout the mountaineering literature, has a strong connection with the way an architect during, and after, Delorme's time was defined; that there was a difference between the person who planned the buildings and the one who executed the building of them.[90] Correspondingly, in mountaineering, there developed a difference between the one who planned the climb as opposed to the one who lead the way on a climb. A passage from Whymper's book makes the distinctions between these two individuals clear, it is a passage where the author was, after many seasons of apprenticeship, on the threshold between being an apprentice and becoming a fully trained mountaineer, a master craftsman, himself:

> I explained to the guides the routes I proposed to be taken, and [...] sketched them out on paper to prevent misunderstanding. In some few cases they suggested variations, and in every case the route was

[90] See Nikolaus Pevsner, 'The Term 'Architect' in the Middle Ages'. *Speculum*, 4, 17, (1942), Medieval Academy of America, p. 549

> well discussed. The execution of the work was done by the guides, and I seldom interfered with, or attempted to assist it.[91]

It seems, then, that it is this threshold, the knowledge of theory, which can reassign the duties of someone merely carrying out the manual tasks of a practitioner to someone who is able to plan and suggest routes to be taken. This planning and suggestion of routes was, however, no different to the tasks that the guides had previously been in charge of. What, then, made it possible for Whymper, the educated Englishman to now become the mountaineer who also planned the routes to be taken? This change that took place during the mid to late nineteenth century, seemed to depend firstly upon the level of abstract theoretical knowledge that these educated climbers, or the 'educated intelligence' as we previously saw Whymper called them,[92] were able to learn in a short amount of time, and theory therefore proved to separate the true master craftsman from the theorist craftsman, but as we have seen, not necessarily in that order of importance.

Secondly, alongside this abstract theoretical knowledge, they also had access to instruments they could use in order to test their knowledge, and these analytical observations made using instruments and tools on-site, proved to become a major factor in their sense of mastering the mountains alone and, essentially, now without the mountain guide. A couple of paragraphs from Kennedy and Hudson's book with the telling title: *Where There's a Will There's a Way: An Ascent of Mont Blanc By a New Route and Without Guides*, published in 1854 can shed light onto this. 'By examining maps and models, we had made ourselves as nearly masters of the route as possible'[93] they write, and further on that:

> Cuidet [the guide] pointed out two large crevasses at the upper extremity of the Plateau, and told us the Chamounix route lay between them. This information was useful, but beyond the place where we now stood the presence even of the best-informed guide would have been but of little benefit, since the right direction was well known to us from ocular observation, from examining models of the chain, and from numerous conversations with those who had frequently visited the heights.[94]

[91] Whymper, *The Ascent of the Matterhorn*, p. 207
[92] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 105
[93] Rev. C Hudson and E. S Kennedy, *Where There's a Will There's a Way: An Ascent of Mont Blanc by a New Route and Without Guides* (London: Longman, Brown, Green, and Longmans, 1856), p. x
[94] Hudson and Kennedy, *Where There's a Will There's a Way*, p. 60

It is thus evident that the mountain guide was now becoming redundant on the presumption that studying representations of the mountains along with their analytical observations of the mountains using instruments and tools had made them as close to being 'masters' of the route as one possibly could. By 'ocular observations' the authors are referring to the common practice by mountaineers during this time to measure, and record, all parts of the mountain by using telescopes and clinometers, the latter, which will be discussed in a later part of this thesis. The question remains to be answered: how did these analytical observations that relied upon representations and instruments make them any more capable of planning routes than the guides, who did not? Whymper said, for example, about his guide Michel Croz:

> He did not need urging, or to be told a second time to do anything. You had but to say what was to be done and how it was to be done, and the work was done, if possible.[95]

The relationship between the guide and the apprentice was, then, one where the previous apprentice now clearly had a substantial position of power, and at first it would be natural to assume that this was due to his status as a paying employer, but it is clear from the passage above that Whymper also was in charge of how climbs were to be executed.

The mountain guide, then, was gradually and less often seen as a master and instead as a mere practitioner separate from his employer, the theoretician, on the presumption that theoretical as well as practical knowledge had the capacity to make this severance between figures tackling the same perpetual problems in what was invariably the same space. Despite this clearly distinct difference between the two figures, Whymper's verbal descriptions of his guide Melchior Anderegg paints a picture of his mountain guide as someone who had all the characteristics of a man with considerable power and influence:

> Who is Melchior Anderegg? Those who ask the question cannot have been in Alpine Switzerland, where the name of Melchior is as well known as the name of Napoleon. Melchior, too, is an emperor in his way – a very Prince amongst guides. His empire is amongst the 'eternal snows' and his sceptre is an ice axe.[96]

Several writers, like Whymper and Wills, had made it very clear in their texts that their success on the mountain was entirely indebted to such apprenticeships.

[95] Whymper, *The Ascent of the Matterhorn*, p. 126
[96] Whymper, *The Ascent of the Matterhorn*, p. 137

Leslie Stephen also writes: 'I utterly repudiate the doctrine that Alpine Travellers are or ought to be the heroes of Alpine Adventures' and he states that his own mountaineering achievements were wholly as a result of 'following men better than [himself]'.[97] Correspondingly, Stephen's book, throughout, shows a profound respect for the mountain guides and it is clear that he believed in learning through practical experience and knowledge passed down from the guides. However, and as we have seen, these authors created a very distinct difference between themselves and the guides and the relationship of trust between them that previously dominated this era of mountaineering diminished greatly. It is not entirely clear whether this was due to the development of written theory, but some examples below will illustrate this further.

This broken relationship is most distinct in the earlier publication by Hudson and Kennedy. In this book we find a direct contempt for the mountain guides that Whymper later advocated. The title does, in that respect, speak for itself. Those who wanted to use guides, Hudson and Kennedy writes, had to apply to what was called the 'guide-chef' who had the responsibility of selecting the required number and names of guides for the planned climb. What the authors expressed in the book, however, was a feeling that these guides were neither competent nor skilled enough to undertake the responsibilities of guiding a mountaineering trip, and despite the existence of a system that examined the guides, the authors were nevertheless very dissatisfied with both their level of skill, their competence as well as their character. Most of these guides, they write, had never been on the summit of the mountain, nor were they prepared for a night out in the open.[98] On these accounts, amongst others, Hudson and Kennedy consequently decided to climb the mountains by choosing their own route and, most importantly, without guides.

The much later account by Frederick Burlingham, *How to Become an Alpinist*, also showed a concern about the skills of mountain guides:

> It is true there is at Chamonix a Bureau des Guides, where the enrolled guides take turn at being engaged, but while this gives the unfit guides a chance, the unsuspecting tourist applying there may find the bureau has given him a drunkard, a guide quite incapable of expert climbing.[99]

[97] Stephen, *The Playground of Europe*, p. 75
[98] Hudson and Kennedy, *Where There's a Will There's a Way*, pp. 4-5
[99] Burlingham, *How to Become an Alpinist*, p. 105

This critique of the mountain guides is one of character, and it seems that, since Burlingham's book was one of the first attempts at an instructional book written by, and for, the intellectual elite, there was now not only a separation of knowledge between the unread mountain guide and his educated apprentice, but also between the personality traits of the two. As a result, the authors shed suspicion about the mountain guides, and indeed also, at times, ridiculed them.

The nineteenth century climbers and writers of mountaineering books, then, clearly disagreed about the value of theory, some defending the systematic and theoretical study of climbing, others shielding behind a strong faith in learning the craft through practical experience and apprenticeships. Nevertheless they all had an effect on how the role of the mountain guide was now perceived and thus also how the new mountaineer was defined, and it may be suggested that the development of written theory was indeed responsible for this. The accounts above, describing the unskilled mountain guides, shares some qualities with Delorme's text about his stoneworkers, and it showed the same type of criticism about his workers as the mountaineer's of their guides. We saw earlier that Delorme indeed complained that the masons were engaging in 'frivolous'[100] activities, referring to their lack of theoretical engagement and their intellectual capacity. Consequently, the mountain guides, who shared the same status as the masons, became victims of this ridicule and due to their lack of intellectual engagement, were not seen as worthy of serious consideration.

Delorme seems split around this question and throughout his treatise he oscillates between making less credible arguments about the advantages of learning the craft of stonecutting through the study of systematically written theory[101] - to more persuasive assertions that without this type of theoretical mastery of the craft, their ability to understand the art of stonecutting would, in actual fact, be improbable.[102] Delorme's opinion on the theoretical learning of geometry then, was clearly stated in Book III, where he said that 'it is unlikely that it [the cut] will be understood except by those who already have Geometry under control'.[103] By 'geometry', as always throughout Delorme's treatise, he means the theoretical understanding of the properties and relationships of the points, lines and angles of the stone. We see thus a

[100] Delorme, *Le Premier Tome de l'Architecture*, fol. 57v/p. 145
[101] Delorme, *Le Premier Tome de l'Architecture*, fol. 61v/p. 153
[102] Delorme, *Le Premier Tome de l'Architecture*, fol. 78v/p. 188
[103] Delorme, *Le Premier Tome de l'Architecture*, fol. 78v/p. 188

very different type of emphasis on the significance of theory than when he previously talked about the advantages of knowing theory, because now as he says, the cut is indeed 'unlikely' to be understood without it.

Although his remark relates to a problem that is relatively more complex than earlier problems in the treatise, he does not consider it difficult enough to need any further and more detailed explanations of the cut. It should, he says, be understood by means of the cuts described previously. On account of this he decides that a longer explanation would be superfluous and consequently refers back to the cuts described earlier for further clarification.[104] To learn stonecutting through the study of progressively more difficult cuts would account instead for a learning process based upon incrementally more complex practical tasks and not the theoretical methods he so often proclaims throughout his treatise. It shows without doubt that his point of view on the significance of learning stonecutting in theory varies throughout Books III and IV.

Delorme's remarks about learning geometry in theory, then, were not as deeply embedded within his own practice as it first appeared, and he seemed to believe as much in the practical methods of solving spatial problems as through the theoretical methods. On the one hand Delorme is 'very displeased' because 'we cannot find many books accommodating the theory of Geometry to the practice and use [...] of our Architecture'.[105] On the other hand, it is clear throughout Delorme's treatise that there are several examples of his apprehension and concern about the risks that writing theories would bring. He was worried about whether architects consequently would forget how to put their theories into practice, something that undoubtedly was one of the main intentions of Delorme's work. The value of theory as an instrument to learning a craft, then, was clearly not Delorme's sole motivation for writing his books on stonecutting, nor was it intended as the end result. Once learned in the theory of stonecutting, the architect should be able to apply his knowledge by putting his hands to work, so to speak, and as Delorme says be able to create just about any design or cut of a stone.

Another indication of the problematic relationship that Delorme had to theory and between architect and stonecutter becomes evident when examining for whom Delorme's Books III and IV were intended. Delorme stated that these books were

[104] Delorme, *Le Premier Tome de l'Architecture*, fol. 78v/p. 188
[105] Delorme, *Le Premier Tome de l'Architecture*, fol. 71r/p. 173

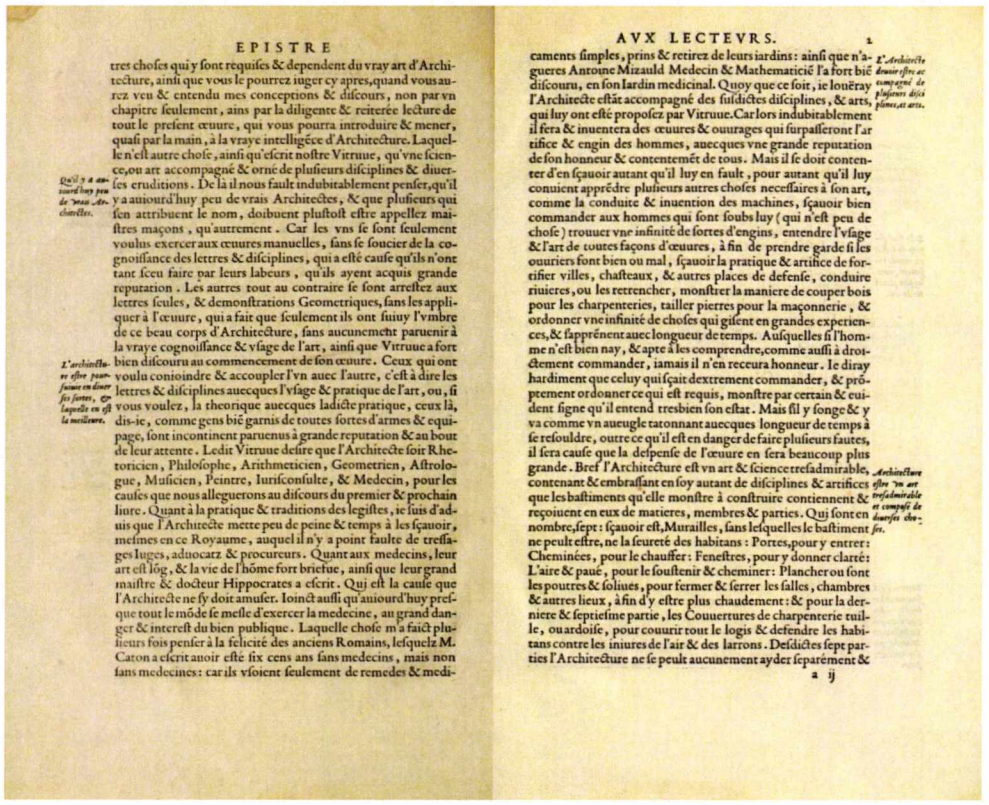
written principally for stoneworkers[106] although he made repeated efforts throughout the text to explain processes that masons and stonecutters in actual fact would find relatively simple to do. This was, he said, because the books were also written for those 'curious' and 'gentle spirits' who wanted to know if the workers were doing their job correctly.[107] These 'gentle spirits' indicated the 'gentleman architect' common during the Renaissance and were also Delorme's terms for those architects not trained in stonecutting, and those 'not of the art' as he regularly maintained, but who nevertheless were seeking to establish themselves in a position of authority over the stoneworkers.[108] The theoretical architect, then, had to master the spatial problem-solving techniques in practice, but he also wanted the practical stonecutters to understand the geometrical theory underlying their techniques; the two had to conjoin. It is, hopefully by now; unnecessary to draw out the parallels this has with the educated apprentice and his guide, as we saw above.

What is intriguing here is Delorme's concern that, if an architect adhered *too* rigidly to theory, architecture would only remain a shadow of itself, as the following passage clearly conveys:

> Others on the contrary went no further than to letters and geometric proofs, without applying to the work, which meant that they only followed the shadow of this great body of architecture without achieving any real knowledge [...][109].

Delorme's idea that architects being too close to theory would only be following a 'shadow' of what he believed architecture to be - is the strongest suggestion in his text of what he truly considered a professional architect to be. As a result we see in Delorme's treatise two very different kinds of opinions, the ones where Delorme is mostly concerned with practice and the ones where he was mostly concerned with theory. Despite his oscillating arguments, he appeared to believe that a good architect was both a theoretician and a master practitioner; that the two had to conjoin. Theory, then, must be applicable to practice, but practical experience must also be grounded in abstract theory.

[106] Delorme, *Le Premier Tome de l'Architecture*, fol. 58v/p. 147
[107] Delorme, *Le Premier Tome de l'Architecture*, fol. 68v-69r/p. 168
[108] I use here 'stoneworkers' to include stonemasons as well as stonecutters.
[109] Delorme, *Le Premier Tome de l'Architecture*, fol. 1v (translation Elie Harfouche), 'Les autres tout au contraire se sont arrêtes aux lettres seules, et démonstrations géométriques, sans les appliquer a l'œuvre, qui a fait que seulement ils ont suivi l'ombre de ce beau corps d'architecture sans aucunement parvenir a la vraie connaissance [...].'



EPISTRE

tres choſes qui y ſont requiſes & dependent du vray art d'Architecture, ainſi que vous le pourrez iuger cy apres, quand vous aurez veu & entendu mes conceptions & diſcours, non par vn chapitre ſeulement, ains par la diligente & reiteree lecture de tout le preſent œuure, qui vous pourra introduire & mener, quaſi par la main, à la vraye intelligẽce d'Architecture. Laquelle n'eſt autre choſe, ainſi qu'eſcrit noſtre Vitruue, qu'vne ſcience, ou art accompagné & orné de pluſieurs diſciplines & diuerſes eruditions. De là il nous fault indubitablement penſer, qu'il y a auiourd'huy peu de vrais Architectes, & que pluſieurs qui ſen attribuent le nom, doibuent pluſtoſt eſtre appellez maiſtres maçons, qu'autrement. Car les vns ſe ſont ſeulement voulus exercer aux œuures manuelles, ſans ſe ſoucier de la cognoiſſance des lettres & diſciplines, qui a eſté cauſe qu'ils n'ont tant ſceu faire par leurs labeurs, qu'ils ayent acquis grande reputation. Les autres tout au contraire ſe ſont arreſtez aux lettres ſeules, & demonſtrations Geometriques, ſans les appliquer à l'œuure, qui a fait que ſeulement ils ont ſuiuy l'vmbre de ce beau corps d'Architecture, ſans aucunement paruenir à la vraye cognoiſſance & vſage de l'art, ainſi que Vitruue a fort bien diſcouru au commencement de ſon œuure. Ceux qui ont voulu conioindre & accoupler l'vn auec l'autre, c'eſt à dire les lettres & diſciplines auecques l'vſage & pratique de l'art, ou, ſi vous voulez, la theorique auecques ladicte pratique, ceux là, dis-ie, comme gens biẽ garnis de toutes ſortes d'armes & equipage, ſont incontinent paruenus à grande reputation & au bout de leur attente. Ledit Vitruue deſire que l'Architecte ſoit Rhetoricien, Philoſophe, Arithmeticien, Geometrien, Aſtrologue, Muſicien, Peintre, Iuriſconſulte, & Medecin, pour les cauſes que nous alleguerons au diſcours du premier & prochain liure. Quant à la pratique & traditions des legiſtes, ie ſuis d'aduis que l'Architecte mette peu de peine & temps à les ſçauoir, meſmes en ce Royaume, auquel il n'y a point faulte de treſſages Iuges, aduocatz & procureurs. Quant aux medecins, leur art eſt lõg, & la vie de l'hõme fort briefue, ainſi que leur grand maiſtre & docteur Hippocrates a eſcrit. Qui eſt la cauſe que l'Architecte ne ſy doit amuſer. Ioinct auſſi qu'auiourd'huy preſque tout le mõde ſe meſle d'exercer la medecine, au grand danger & intereſt du bien publique. Laquelle choſe m'a faict pluſieurs fois penſer à la felicité des anciens Romains, leſquelz M. Caton a eſcrit auoir eſté ſix cens ans ſans medecins, mais non ſans medecines: car ils vſoient ſeulement de remedes & medi-

Qu'il y a auiourd'huy peu de vrais Architectes.

L'architecture eſtre pourſuiure en diuerſes ſortes, & laquelle en eſt la meilleure.

AVX LECTEVRS. 2

caments ſimples, prins & retirez de leurs iardins: ainſi que n'agueres Antoine Mizauld Medecin & Mathematicie l'a fort biẽ diſcouru, en ſon Iardin medicinal. Quoy que ce ſoit, ie louëray l'Architecte eſtãt accompagné des ſuſdictes diſciplines, & arts, qui luy ont eſté propoſez par Vitruue. Car lors indubitablement il ſera & inuentera des œuures & ouurages qui ſurpaſſeront l'artifice & engin des hommes, auecques vne grande reputation de ſon honneur & contentemẽt de tous. Mais il ſe doit contenter d'en ſçauoir autant qu'il luy en fault, pour autant qu'il luy conuient apprẽdre pluſieurs autres choſes neceſſaires à ſon art, comme la conduite & inuention des machines, ſçauoir bien commander aux hommes qui ſont ſoubs luy (qui n'eſt peu de choſe) trouuer vne infinité de ſortes d'engins, entendre l'vſage & l'art de toutes façons d'œuures, à fin de prendre garde ſi les ouuriers font bien ou mal, ſçauoir la pratique & artifice de fortifier villes, chaſteaux, & autres places de defenſe, conduire riuieres, ou les retrencher, monſtrer la maniere de couper bois pour les charpenteries, tailler pierres pour la maçonnerie, & ordonner vne infinité de choſes qui giſent en grandes experiences, & ſapprẽnent auec longueur de temps. Auſquelles ſi l'homme n'eſt bien nay, & apte à les comprendre, comme auſſi à droictement commander, iamais il n'en receura honneur. Ie diray hardiment que celuy qui ſçait dextrement commander, & prõptement ordonner ce qui eſt requis, monſtre par certain & euident ſigne qu'il entend tresbien ſon eſtat. Mais ſil y ſonge & y va comme vn aueugle tatonnant auecques longueur de temps à ſe reſouldre, outre ce qu'il eſt en danger de faire pluſieurs fautes, il ſera cauſe que la deſpenſe de l'œuure en ſera beaucoup plus grande. Bref l'Architecture eſt vn art & ſcience treſadmirable, contenant & embraſſant en ſoy autant de diſciplines & artifices que les baſtiments qu'elle monſtre à conſtruire contiennent & reçoiuent en eux de matieres, membres & parties. Qui ſont en nombre, ſept: ſçauoir eſt, Murailles, ſans leſquelles le baſtiment ne peult eſtre, ne la ſeureté des habitans: Portes, pour y entrer: Cheminées, pour le chauffer: Feneſtres, pour y donner clarté: L'aire & paué, pour le ſouſtenir & cheminer: Plancher ou ſont les poutres & ſoliues, pour fermer & ſerrer les ſalles, chambres & autres lieux, à fin d'y eſtre plus chaudement: & pour la derniere & ſeptieſme partie, les Couuertures de charpenterie tuille, ou ardoiſe, pour couurir tout le logis & defendre les habitans contre les iniures de l'air & des larrons. Deſdictes ſept parties l'Architecture ne ſe peult aucunement ayder ſeparément &

L'Architecte deuoir eſtre accompagné de pluſieurs diſciplines, et arts.

Architecture eſtre vn art treſadmirable et compoſé de diuerſes choſes.

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7 Pages from Delorme's treatise, fol. 1v and fol. 2r

However, it would seem from passages such as this that, instinctively, Delorme was perhaps more in favour of the practical than the theoretical side, and we will explore this idea further in chapter two. Delorme's conflict is evident also in the prologue to Book III, where he writes that the two books on stonecutting were intended to make the cuts better known, however, that these cuts

> which will become known through the reading and discussion, cannot be properly found or practiced save with the aid and handling of the compass.[110]

This passage explains that, although Delorme wanted the knowledge about stonecutting, and its theory, to be disseminated through the written text, without also using the stonecutter's main tool - the compass - stonecutting would not be properly understood. This practical understanding of the craft was emphasised through his drawing of the learned architect coming out from a cave holding his robe in one hand and a compass in the other. The robe, the sign of a learned man, represented the

[110] Delorme, *Le Premier Tome de l'Architecture*, fol. 50r/p. 129

theoretical approach, and the compass, the practical approach to stonecutting. Despite Delorme's repetitive claims about the learning of theory he seemed unable to embrace theory alone as adequate in itself in becoming a modern architect. This dichotomy is immensely significant not only for our knowledge of Delorme's emergence as one of the first modern architects but also for the profession as a whole during this time.

Theory, then, was a precursor to a number of challenging developments within, and relationships between, architecture and mountaineering. It developed, in all probability only as a natural instinct and an attempt to analyse practical matters through abstract thinking and reasoning. The effect, distinct crafts that had systematically organised their methods and techniques, had enormous consequences for both professions that is noticeable still today.

Theory after Delorme and Young

During the sixteenth, seventeenth and parts of the eighteenth century, there were several attempts to create a more methodical and universally applicable theory of stonecutting, and this is what we know today as 'stereotomy', but according to Perez-Goméz, theory did not manage to achieve this type of universal applicability because theory was 'practically irrelevant to their techniques', he argues.[111] His line of reasoning emphasises the problematic relationship that Delorme had to theory as we saw earlier. The stoneworkers continued to build vaults and complex stone constructions without the use, or only infrequent use, of these theories and also of their constructional drawings. Perez-Goméz argued further that stereotomy was a very ineffective technique and that the studies by Delorme were too specific and impossible to understand.[112] This meant that the fundamental practice of stereotomy remained instead a craftsman's practice: stonecutting, and not that of a theorist. Girard Desargues, the founder of projective geometry, attempted later to replace this practice with an 'all-embracing theory', which, in his opinion had to include an explanation of the technical means by which projective geometry was done.

[111] Alberto Perez-Gomez, *Architecture and the Crisis of Modern Science.* (Cambridge, Mass.; London: MIT, c1983), p. 227
[112] Perez-Gomez, *Architecture and the Crisis of Modern Science*, p. 227

However, these technical means were both exact and 'developed through reason' *or* 'imprecise, deriving from approximation and intuition'.[113] Nevertheless, Desargues was the first to create anything like a universal theory of stonecutting, but by that time, stonecutting was no longer the pride as an architectural construction technique that it was during Delorme's time, around a century earlier. Before Desargues there had been an acceptance of the role of practice and of the stoneworker as a practitioner, but Desargues wanted to create a theory that could solve *all* of the problems in stonecutting, in opposition to the earlier treatises, such as that by Delorme, which only dealt with specific problems of a specific time and place.[114] Desargues wish was founded in his belief that an architect should be able to provide the craftsmen with precise drawings for each and every stone to be cut, just as he would provide plans, sections or elevations for whole buildings. Desargues meant that architects 'should never allow the masons to invent these tracings since they had nothing more to go on than their own experience'.[115] In one sentence, he reduced thus a craft that for centuries had relied on a passing down of knowledge in the system of apprenticeships, to a craft that now should rely entirely upon theory.

Despite Desargues' attempts however, and due to the reasons we saw above, stereotomy was to remain an imprecise craft and its designs derived from the 'approximation and [...] intuition of craftsmen'[116] for at least another century. During the seventeenth and eighteenth centuries, stereotomy was not very popular but it remained nevertheless an intriguing mystery to a small number of people who wanted to solve these geometrical riddles. The enigma it carried with it throughout time resulted in Amédée-Francois Frézier's work that attempted to prove that theory was the 'soul' of the arts as well as of the science, and that it was a successful application in practice, although this was something most of his contemporaries denied.[117] Frézier believed that theory would accelerate the process of finding solutions to problems and wanted to offer a different, and better, theory to other authors who he believed stood 'too close' to practice to produce such a theory. However Frézier concluded in the end that the 'natural geometry of the craftsman was usually enough to solve most problems' and his theory was therefore seen as ineffective to a practice that still relied

[113] Perez-Gomez, *Architecture and the Crisis of Modern Science*, p. 229
[114] Perez-Gomez, *Architecture and the Crisis of Modern Science*, p. 229
[115] Perez-Gomez, *Architecture and the Crisis of Modern Science*, p. 232
[116] Perez-Gomez, *Architecture and the Crisis of Modern Science*, p. 229
[117] Perez-Gomez, *Architecture and the Crisis of Modern Science*, p. 232

on traditional methods and that was, 'for the most part still successful'.[118] The challenge faced by the theoreticians of stereotomy in the seventeenth and eighteenth centuries to solve the geometrical puzzles of stonecutting, were instead riddled with unsuccessful attempts to discover this universal theory and remained unsolved until the nineteenth century. Stereotomy then, as Joël Sakarovitch pointed out, served well then as it does now, as a scene for the theory versus practice debate.[119]

Sakarovitch argued that stereotomy in practice really was 'a hymn to slow motion'[120] and suggested that the slow process of form-discovery used by the craftsmen was a perfectly adequate process. The secrecy of the guilds contributed to protecting the hidden theories within the practice of stereotomy.[121] However, this underlying theory was no more than an approximation itself and with its many errors could hardly stand up to being a 'theory' since it was not universally applicable. Stereotomy is deeply rooted in geometry, but despite this fact the geometrical configurations were constructed by what Sakarovitch calls 'a slow back and forth process'. This, he argues, constituted a base for 'pre-geometrical experience'.[122] The 'natural geometry' of the craftsmen could hardly stand up to these aspirations, but provides us nevertheless with a significant process in geometry: to find solutions to problems through a slow back and forth method which required bodily contact with the object instead of relying on theories to provide built solutions. After all, a theory cannot build anything.

After Young's *Mountain Craft*, the number of climbing manuals published increased rapidly and from the 1950's to the end of twentieth century we saw that the climbing literature quite literally exploded onto the market. This was not only the number of climbing manuals, but also a vast number of climbing accounts. Furthermore, into the 21st century, we continue to see a colossal number of books published on climbing; this includes guidebooks as well as the more specific theoretical books focused upon the systematic learning of climbing techniques. The argument, above, that stereotomy even after Desargues' development of a universal theory

[118] Perez-Gomez, *Architecture and the Crisis of Modern Science*, p. 233
[119] Sakarovitch, 'Stereotomy, a Multifaceted Technique', p. 6
[120] Sakarovitch, 'Stereotomy, a Multifaceted Technique', p. 8
[121] Sakarovitch, 'Stereotomy, a Multifaceted Technique', p. 4
[122] Sakarovitch, 'Stereotomy, a Multifaceted Technique', p. 3. Through using the term 'pre-geometrical', Sakarovitch provides us thus with a surprising, but direct link between the practice of stereotomy and Husserl's idea of an *Origin of Geometry*. Husserl's entire work was a life-long quest to understand what geometry was before handed-down axioms existed and to return to the first geometrical thought. See Jacques Derrida, *Edmund Husserl's Origin of Geometry: an introduction* translated [from the French], with a preface by John P. Leavey, Jr; David B. Allison, ed. (New York: N. Hays ; [Hassocks]: Harvester Press, 1978)

remained a practical discipline because theory never managed to become universally applicable, illustrates the connection that stereotomy had to mountaineering. In climbing, no matter how many books on the subject gets published and how many climbing manuals that exist, these theories, although useful, will always lack the direct relationship between abstract theory and the learning of a technique in practice, its application. This, Perez-Gomez claimed was the chief problem also in the attempts that were made throughout history at creating a universal theory of stereotomy.

Conclusion

This chapter has looked at the ways in which the two fields, architecture and mountaineering, attempted to master their two disciplines by producing bodies of rules, principles and techniques, theories, in the form of written instruction manuals. Neither discipline had previously focused upon a systematisation of technique in this way and their attempts made a distinct break from the past. The previous absence of a system was linked to both disciplines' lack of definition as professional practitioners, and the production of these texts thus created a more precise expression of what their activities consisted of, and how they were done. The texts were therefore also the making of their identity; they represented sets of characteristic methods which belonged uniquely to their spatial activities and which they could identify themselves with. The focus upon a systematisation of their spatial activities produced in turn new methods and processes of doing things and thus also new techniques, which resulted in more technically advanced constructions and climbs. Spatial problems that previously could not have been resolved were now possible. This in turn gave each profession a new pride in their work and this was the distinct value that theory brought with it. They had the ability to learn the skills of the professions through reading and in much less time than previously. Written theories also meant there was a more precise system from which one could fall back on when instinct alone failed. Knowledge disseminated through written text was problematic and riddled with challenges, but it provided the foundation upon which a stronger sense of their profession was able to emerge and thus also a feeling that they had mastered a significant part of the body of knowledge which underpinned their spatial activities. This knowledge is in itself an essential component of what 'mastery' is.

2

Practical Geometries

Hapticity and Vision as Technical Repertoires

To extend the discussion from the previous chapter, which focused solely upon the role of theory, this chapter will now also focus upon theory's counterpart: the role of the practical. By practical, it is those techniques that employed the body and its senses in order to solve spatial and geometrical problems, which are referred to. This is, then, the second point where the two disciplines architecture and mountaineering converge. What does 'the practical' consist of and how did the two practitioners' view the role of practical experience in being able to climb and build? What do they think about the role of practical over theoretical knowledge? Ultimately, these questions will draw out how practical experience effected a sense of mastery of their craft. Examining the practical in this sense will involve looking at two types of geometries that William Ivins identified, in order to draw out important practical techniques that both disciplines used. This involves the use of both haptic and visual ways in which their craft could be measured and thus grasped, or mastered and these are, I will argue, what defines the 'practical geometry', of the title. The first, the haptic techniques of measure will examine the role of direct physical experiences of the object, and the ways in which this provides a corporally felt knowledge about the object that is measured in these other terms. The second, the visual techniques will look at the role of sight as a distant experience of the object and the ways in which, through the use of instruments and tools on-site and trust in the eye alone, this provides another practical method of making systematic observations, a *seen* knowledge.

One part will examine the practice of stonecutting and again, it will use Philibert Delorme's Books III and IV of his treatise *Le Premier Tome de l'Architecture*. This is in order to see a fragment from architectural history that has recorded an architect's views on the role of practical experience during a time when significant historical changes occurred in the way that practical knowledge and experience were perceived. It was a change that Delorme partly initiated through the writing of his treatise and especially the two books dedicated to stonecutting. A discipline that for centuries had relied upon the practical knowledge and experiences of its master craftsmen altered to become one that depended increasingly upon abstract and theoretical knowledge and that was defined accordingly. This chapter will attempt to draw out from Delorme's treatise what his views on the role of practical experience were and what value he placed upon the practical in being able to master his craft. Delorme's text provides us with a fairly limited, though no less relevant, number of references, but where Delorme's text is merely suggestive, it will draw upon more modern texts on stonecutting in order to form a fuller picture. In this way we will get a better insight into the role of the practical in the architect and stonecutter's techniques. Examining the practical will involve an analysis of the connection between hand and eye, the relationship between making and seeing, as well as the role of the eye alone and techniques employed in order to study the object or the building.

The other part of this chapter will examine Geoffrey Winthrop Young's *Mountain Craft* and some of the most important books written from around the mid to late nineteenth century and that were the precursors to Young's book. It will study the role that practical knowledge and experience had within the mountaineering scene during this time. More specifically, it will examine the ways in which their practical approach to solving problems influenced their ability to grasp a real sense of, and thus master, the spaces they climbed in. In the previous chapter it was clear that written theories began to appear around the end of the nineteenth century and culminating in Young's early twentieth century manual. However, these theories nevertheless were formed precisely from that which they, by writing, had separated themselves from - those experiences of climbing that relates to the tangible and concrete rather than the abstract and theoretical. The question asked here is what evidence do we find in the texts of their views towards the role that haptic knowledge had in developing their sense of mastery of the mountain?

As part of this enquiry we will also see how verbal descriptions of these concrete experiences of climbing changed from being a part of narrating travel literature to being used as techniques in their own right. In this way we will begin to see the changes that took place within the language that was used in the instructional literature that emerged from the end of the nineteenth century with Clinton Thomas Dent's *Mountaineering* (1892) and at the beginning of the twentieth century with Geoffrey Winthrop Young's *Mountain Craft* (1920). Techniques that relate to the visible qualities of the mountain field and the methods used in order to measure it will also be examined, revealing yet another aspect of the mountaineer's repertoire of techniques. As with Delorme, it will examine the connection between hand and eye and also the eye alone as a tool in their repertoire of techniques.

In the two disciplines we will see that their differences as well as their similarities meet; in the climbing literature a change from a practice focused on analysing the visual field using instruments on site to being focused on the role of the body and eye as instruments in their own right. The opposite is seen in architecture in the sixteenth century, and we see in Delorme's text an attempt at creating a literature devoted to theoretical principles, but nevertheless preoccupied with bodily experience as well as with visual perception. It is not as important where to begin the construction of this text, but more importantly, by a demonstration of the ways in which the disciplines at times go in the same, and at other times, in opposite directions, we will be able to see one discipline through the other.

Theory and reader audience

What do we mean by the practical, and how does the practical relate to geometry? What is a 'practical geometry'? The term 'practical geometry', as we saw in the introduction to this thesis, was borrowed from Kurt Diemberger's book *Summits and Secrets* where he wrote about his realisation as a mountaineer that he had been practicing the same geometry on the mountain as in the geometry classes at school. The geometry he practiced as a mountaineer gave him, he writes, 'a sense of mastery over all planes, the horizontal, the vertical and all the others, but in their actual reality. A gigantic practical geometry'.[123] Diemberger uses the word 'practical' in connection

[123] Diemberger, *Omnibus: Summits And Secrets, The Endless Knot, Spirits Of The Air*, p. 180

with geometry's 'actual reality' and it is not an abstract, theoretical understanding of geometry, but a concrete experience and one that relates to objects that have actual physical existence. It is geometry in three dimensions, and a mountain is, as he says, 'gigantic' if compared with its other, abstract existence, but the mountain is nevertheless difficult to understand and to grasp a real sense of. Diemberger was able to grasp the properties of the space, its horizontality, its verticality, and their relationships to one another through concrete experience. In mathematics we may refer to this as 'applied geometry', but the thesis will as far as possible avoid using this term, in order to underline the distance with which this project takes to mathematics and instead borrow Diemberger's term as he used it above.

A 'practical geometry' suggests a slower process of solving spatial and geometrical problems, such as understanding an object's shape and the ways in which properties of the object fits together, and it uses haptic as well as visual means in order to do so. Geometry is here not understood through the abstract theories that we saw in the previous chapter; instead it is directed into the two parts that we saw William Ivins had identified; the first, a metric geometry and the second, a projective geometry. Metric geometry, he explained, is a geometry of touch because it is assessed by how things *feel* when put together, and projective geometry is a geometry of vision because it is assessed by how things *look* from a given standpoint.[124] This first part of the chapter is concerned only with the first type of geometry, the geometry that is related to touch and one that is assessed by how it feels.

In the previous chapter Philibert Delorme advocated the value of a theoretical understanding of the geometrical principles that underpinned the craft of drawing and cutting stones. However, throughout Books III and IV, he does at the same time 'beg' the reader that he must understand the importance of learning geometry also in practice. Delorme's text, which at times supported a practical knowledge of geometry, but at other times a theoretical knowledge of geometry, is intrinsically connected with the difficulty that Delorme had in defining whom the reader of his treatise was, and especially his two books on stonecutting. When explaining the geometric cut for doorways and descents to cellars, the first of the cuts that Delorme described in Book III, he writes that he hopes his description would not be 'too vexing and difficult by those who are not of the art'. [125] The stonecutters and master masons, however, and

[124] Evans, *The Projective Cast, Architecture and Its Three Geometries*, p. xxxiii
[125] Delorme, *Le Premier Tome de l'Architecture*, fol. 58v/p. 147

whom the book was primarily written for, as he says, would 'immediately understand the conceit'.[126] However, he ends the chapter with the following message to his readers:

> In brief, of all things that one may do, attend to it that one may understand the practice of Geometry, because then, without any doubt, nothing will appear which one cannot gallantly do.[127]

If the book was primarily written for the stonecutters and master masons that immediately understood the cut however, then who is he saying should learn geometry in practice? It is clear from the text, then, that Delorme is here referring to architects, and that it is they who must 'attend to it' that they learn the practice of geometry. Delorme does not admit to this however, and the difficulty in understanding his view on theory and practice throughout his treatise is due to this failure to distinguish clearly for whom his text is written. On the one hand, Delorme had written the two books with the intention of teaching the theoretical principles of geometry to stone cutters and master masons, on the other hand however, he has written them with the intention of teaching the practical principles of geometry to architects, 'those who are not of the art'. This reflects the blurry boundaries that existed between an architect and a mason during this time and that, often, he was the same man.

Young emphasises in *Mountain Craft* the way in which his book, which dealt with the subject of mountaineering extensively and systematically, were written for a diverse rather than a specific reader-audience, and is as such related to the reader-audience of Delorme's treatise:

> This book is for mountaineers; and a mountaineer is not only one who climbs mountains, but anyone who likes to walk, read, or think about them.[128]

The principle behind this passage, the idea that books, which are essentially treatises, have a diverse reader-audience is something that could be applied to architectural treatises such as Delorme's, as well as to mountaineering handbooks.

Both Young and Delorme were faced with a similar challenge, of establishing a defined relationship between author and reader, between master-practitioner and master-theoretician. Delorme was on the one hand attempting to share the previously secret knowledge of the guilds and by doing so he raised the manual labour of masons

[126] Delorme, *Le Premier Tome de l'Architecture*, fol. 58v/p 147
[127] Delorme, *Le Premier Tome de l'Architecture*, fol. 59r/p. 148
[128] Young, *Mountain Craft*, Charles Scribner's & Sons, p. vii

work onto a higher, intellectual, level, but on the other hand his attempt created a larger gap between manual and intellectual labour, between the masons and the architects, and this causes a real difficulty within Delorme's text:

> We must admit [...] that Masons know more of this than such Architects, which goes against all reason, for the Architect must be learned in order to command and order all kinds of work from Master Masons. However, today in many places, the cart is put (as we say) before the horse, that is to say in more than one place Masons govern and teach Masters [...].[129]

Delorme here removes the term 'Master' from 'Master Masons' and refers instead to the architects as the 'Masters', and what this text in actual fact reveals is that Delorme wanted the architect to be more knowledgeable than the mason in every respect. Quite often they did not, however, since an architect could not be as learned in the practice of geometric cuts as the mason, something which was not possible without him being a mason himself. But what, then, would distinguish the architect from the mason, and theory from practice?

Young, however, seemed to have established a more defined idea of the relationship between the two climbers; the guide and his apprentice, and he had in many ways progressed further than Delorme had on this question during his time. Young had also managed to get a step further than the authors of mountaineering books during the nineteenth century. Accordingly, Young writes:

> If guides have, as a whole, not progressed in the responsible and sympathetic qualities essential for management, amateurs have improved out of all proportion. [...] Consequently the good amateur now brings to the partnership a mountaineering qualification unimagined fifty years ago [...].[130]

By the time Young published his mountaineering handbook in 1920, which had been delayed for about 6 years due to the First World War, there was a more distinct difference between the mountain guide and the English explorer and traveller-turn-mountaineer. In the text, Young separates the two as 'guide' and 'amateur', although at the same time suggesting that the amateurs had progressed and surpassed the knowledge and experience of the guides.

[129] Delorme, *Le Premier Tome de l'Architecture*, fol. 81r (Translation in Lefaivre and Tzonis, *The Emergence of Modern Architecture*, p. 145)
[130] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 105

Thus, what happened during the nineteenth century was two things, firstly that the amateur, because of the 'educated intelligence'[131] progressed beyond the skills of the guides. Secondly, that the mountain guides also had to show a higher degree of skill and competence in their role as guides and thus establish themselves as a profession in order to keep their reputation and income as guides. To the great public, Young writes:

> mountaineering means only the traditional route up in the traditional way; and tradition demands the surrender of their intelligence and personal inclinations for a day to the unimaginative tyranny of any two chance peasants between whom they are advised to suspend the exercise of their own finer faculties [...].[132]

The guides that Young describes here were not mountaineers, he writes, but 'peasants' – something that underlines the connotation that a 'peasant' was not learned in theoretical principles of the craft. His manual was thus written to educate all those who liked to climb, walk, read, and think about mountains in order to study and perhaps be a self-taught mountaineer, rather than 'surrender' their intelligence to the 'peasants'.

However, unlike Delorme, Young's manual was not written to educate these 'peasants' guides. Delorme, however, clearly stated that his manual was written to instruct both the 'Master' architect as well as the 'Master Mason'. For both professions, the difference between master and apprentice, or guide and amateur, relied upon distinct values that both Delorme and Young saw in learning, and in the application of systematically learned principles and techniques in the practical implementation of such knowledge, something that neither Delorme nor Young believed their masons and mountain guides engaged in. Delorme's architect, however, did not have the same opportunities to learn stonecutting in practice as Young's mountaineers – whether apprentices or guides. Delorme's ideal was instead of an architect who was in 'command' of the masons, rather than being an equal with them and with the same amount of practical experience, something which seemed to frustrate Delorme – himself the son of a master mason - throughout his treatise.

With Delorme's apprehensiveness towards theory added to this, his position seems to be challenged by his own background, something that places him in muddy waters, as it were, between the architects and the masons. In Book II, Delorme seemed

[131] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 105
[132] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 101

concerned that theoretical knowledge of the principles of geometry would easily be forgotten, and that the workers, as he said, would forget to apply their theories in practice.[133] As a direct consequence of this, as we saw in chapter one, Delorme worried that it should result in architecture being a mere shadow of its former self.[134] Despite Delorme's concerns, however, he never discussed what forgetting to apply theory onto practice meant in more precise terms. Delorme did not explain this in any way at all in his treatise, but as will now become clearer, the mountaineers described their views on the role of theory and practice in quite some detail in their books, something that will be of help also in reading Delorme.

Showing by hand – models and imitation.

What values Delorme placed upon the role of practical experience was insinuated, but rarely described in his text. The only evidence we can draw upon in this respect, and that is clearly evident throughout Delorme's two books, is primarily the ways in which he discusses the practical in terms of 'experience', 'effort' and 'labour'. His use of these terms do emphasise the value that he placed both upon both the mental and physical energy that is exerted in order to learn to draw and cut the stones. For the purpose of the discussion in this chapter it will concentrate only upon the kind of energy that relates to physical effort, however, since chapter five of this thesis will examine the mental powers and effort that is no less important to this process. In Book IV, Delorme writes for example that

> it is unlikely that it [the cut] will be understood except by those who already have Geometry under control and understands cuts with the experience derived from having made the effort to construct them [...].[135]

In this passage, what Delorme emphasises is also the importance of *conjoining* theory with practice, that one needs to have the knowledge of both theory as well as a practical experience of geometry. As he says, through having both the knowledge of 'Geometry', which is here meant as the theoretical knowledge of geometry, as well as the experience 'derived from having made the effort' that it takes in drawing and

[133] Delorme, *Le Premier Tome de l'Architecture*, fol. 47v
[134] Delorme, *Le Premier Tome de l'Architecture*, fol. 1v 'Les autres tout au contraire se sont arrêtes aux lettres seules, et démonstrations géométriques, sans les appliquer a l'œuvre, qui a fait que seulement ils ont suivi l'ombre de ce beau corps d'architecture sans aucunement parvenir a la vraie connaissance [...]'
[135] Delorme, *Le Premier Tome de l'Architecture*, 1567, fol. 78v/p. 188

assembling the cut stones. Otherwise, as Delorme says above, it is doubtful whether the cuts would be understood. A genuine understanding, then, of the art of cutting stones, is derived from 'having made the effort' to cut and construct them.

Further on in his text, Delorme recommends to gain this practical experience through making smaller-scaled constructions, or models, by 'cutting small pieces of wood or stone as if they were to be actually assembled in a great building.'[136] This emphasises particularly well the significance that Delorme saw between theoretical knowledge and actual practical experience, which involves physical effort. The use of models of the cuts would provide this experience, albeit at a different scale to the real building. Any effort, whether it is exerted in model constructions or real sized constructions, would involve extensive practical experience, and it is clear from the treatise that Delorme's repeated emphasis on the importance of learning the craft in what he refers to as 'actual practice', 'experience', 'labour' and 'effort', that he must have been aware of this.

However, although models and practical experience were important, Delorme again draws a strong link between 'reading' and 'experience'. The reader will 'understand better', he writes in Book IV, 'both by reading further in this work, as by the experience of doing it'.[137] Later in the book, he writes that theoretical knowledge of geometry cannot be conjoined with practical knowledge without 'showing by hand':

> there are many things about the practice of cuts that one cannot explain without showing by hand how they should be worked out, either while tracing the stones or at the actual construction.[138]

The way Delorme here connected the 'hand' with the idea that 'the practice of cuts' cannot be explained without it indicating, not only how strongly Delorme believed in learning through practical experience, but also how he struggled with both graphic and verbal representations as a way of explaining the methods of drawing the stones as well as the processes of constructing the stones.

Geoffrey Winthrop Young, despite being the author of the most comprehensive and systematic manual of the principles of mountaineering, was surprisingly reluctant to accept the value that manuals like his own had and it is here worth referring again to the passage in the preface to *Mountain Craft* where he writes that:

[136] Delorme, *Le Premier Tome de l'Architecture*, fol. 78v/p. 188
[137] Delorme, *Le Premier Tome de l'Architecture*, fol. 86v/p. 204
[138] Delorme, *Le Premier Tome de l'Architecture*, fol. 112v/p. 257

> I do not myself attach much value to mountaineering handbooks: an open-air pursuit can only be learned by practical attempt and from good example.[139]

Mountaineering, he continues, have suffered from 'hasty tradition' and doctrines that were 'prematurely crystallized' – and he recalls an experience in his youth where a mountaineering hero of his would strain 'his imagination to squeeze a grave principle out of a random holiday memory'.[140] However, if mountaineering should be regulated by rules that were too rigid these would restrict new and original ideas and mountaineering would no longer be worthy of the name 'art' or 'craft', and at best become an 'organized game', he writes.[141] His manual, unlike such hasty and random doctrines, was written in order to present 'the principles which underlie all correct climbing motions'.[142]

Young's manual, then, attempted to provide principles of climbing that were neither too hasty nor too rigid, but instead to acquaint the reader with the principles of 'climbing motions', those bodily movements that lie at the basis for climbing activity. In this way, Young writes the body into the literature in a way with more assertiveness than in previous books and the earlier manuals. However, what Young attempted to do was difficult because 'climbing motions' was something that only could be described in relatively approximate linguistic terms. Giving an account of the characteristics of the direct and actual experience of movement was not only difficult, but nearby impossible. Thus, although it was Young's intention to provide this knowledge in the text, he also had to admit that mountaineering only really could be learned through practical experience. Delorme similarly wrote that its basic principles could be presented in the written text, but that its experience could not, 'which is why it can hardly be taught by books and writings'.[143]

This is essentially why both authors repeatedly emphasised throughout their two treatises the importance of *imitation*. Although imitation is never a topic of exclusive attention in their texts, it is nevertheless a distinguishing part of their debate. In Young's passage above, for example, we learn that the craft of mountaineering 'can only be learned by practical attempt and from good example',[144] or as in Delorme's

[139] Young, *Mountain Craft*, Charles Scribner's & Sons, p. vii
[140] Young, *Mountain Craft*, Charles Scribner's & Sons, p. vii
[141] Young, *Mountain Craft*, Charles Scribner's & Sons, p. viii
[142] Young, *Mountain Craft*, Charles Scribner's & Sons, p. viii
[143] Delorme, *Le Premier Tome de l'Architecture*, fol. 87v/p. 206
[144] Young, *Mountain Craft*, Charles Scribner's & Sons, p. vii

text that the reader should 'request the advice and understanding of those who make a profession of Geometric cuts [and that these] will make them understand promptly and with few words'.[145] Again, at other times, Delorme writes that the cuts

> are easier to show in practice than to explain and excogitate back to their reasons [...].[146]

There is, then, a distinct difference between what Delorme means by learning something by experience and 'effort' than something that is showed in practice. To 'show' something is to give a demonstration of something and Delorme is therefore suggesting to the reader that he must imitate from those 'who make a profession' of the art. Whereas 'effort', in the earlier passage, indicates instead a learning that happens from *own* experience rather than imitation of others. 'I would add', Delorme writes, 'that extracting the fruition and profit out of written things does not provide the delectation, pleasure and instruction that can be had from things practiced and shown first hand'.[147] *Reading*, then, does not provide the same kind or quality of instruction, as practical experience through 'imitating' and 'effort' did.

When Delorme discusses trompes, the most difficult of the cuts in his treatise, he states that it is possible to create complex stone constructions into any shape one would like if the methods were being carried out as he had described them in the text. These methods he says:

> allows a great savings and gain of time, study and labour to those who know its practice, as I can testify, who learned it with very great labour in my youth.[148]

In his youth, as the son of a master mason, his father must have taught Delorme the craft of drawing and cutting stones. However, this body of systematic techniques that Delorme had devised within his treatise was something he had learned not by using the swift methods he explained in great detail to his readers, however, but 'with very great labour'. The techniques he had used were very time consuming and difficult because, and as he explains further on, there was no single technique that could be applied to the many different types of constructions.[149] The slow 'back and forth'

[145] Delorme, *Le Premier Tome de l'Architecture*, fol. 80r/p. 191
[146] Delorme, *Le Premier Tome de l'Architecture*, fol. 87v/p. 206
[147] Delorme, *Le Premier Tome de l'Architecture*, fol. 87v/p. 206
[148] Delorme, *Le Premier Tome de l'Architecture*, fol. 89v-90r/p. 210
[149] Delorme, *Le Premier Tome de l'Architecture*, fol. 90r/p. 210

methods that Sakarovitch argued in the previous chapter, then, was thus also the ones that Delorme himself would have employed as a young man.

The implications that this kind of method had was that there must have been a process largely based upon trial and error and that this method of finding a satisfactory solution by experimentation was how Delorme's 'effort' and 'very great labour' was exerted. The trials included making models of the constructions, as a way of practicing geometry and the errors, which in all probability included many collapsed constructions, was also a practical experience in its 'actual reality' as we saw Diemberger explained earlier. Although Delorme never takes it further in any way that directly discusses this bodily and practical experience that his texts implies, it is nevertheless evident from his many implications of its role that this connection between knowledge gained in the mind and knowledge gained through the body was a necessary and central part of the continuing understanding of the art.

Erik Benfield's relatively recent book *Purbeck Shop: A Stoneworker's Story of Stone* however, clearly described some of those aspects of experience that are absent from Delorme's text and that can provide a fuller picture, as it were, of what practical experience truly meant. Benfield's detailed descriptions of how the workers relied entirely upon the judgment of their senses whilst executing difficult, and often dangerous, tasks. He describes, for example, the sensation a stone worker has when he feels the almost imperceptible vibrations of a stone when it is about to break, through his hammer:

> the man using the hammer has felt vibration which seems to come out of the stone up through the wedges and into his arms by way of the hammer and handle. Some men who have cut thousands of stones will say they never felt it, but even they know just when to apply the last blows, the blows which really break the stone.[150]

Benfield's example demonstrates precisely the kind of knowledge that Delorme was referring to every time he suggested, but never discussed directly, the importance of direct 'experience' with the material, and of 'effort'. What Benfield describes is a sensation that the stoneworker feels, a 'vibration', which comes 'out of' the stone and leads it way 'up through' and 'into' his arms. This vibration indicates the intimate knowledge that a worker has of his material, one that only long experience can truly impart with. However, Benfield continues that some of the workers 'will say they never

[150] Erik Benfield, *Purbeck Shop: A Stoneworker's Story of Stone.* (London: Cambridge University Press, 1940), p. 96

felt it', but as he points out, even they know when the stone is about to break and thus when to apply the last blow with the hammer, the one that will 'really break the stone'. This type of knowledge is one that first and foremost does not have a body of rules or principles to support it, nor can it be taught by theory, thus it is difficult to part with this knowledge in anything like an instructional manual. As Benfield explains, some men may never have consciously felt this sensation and would therefore not be able to describe it, nor be able to teach it.

It is commonly known that '[b]odily effort provides internal corporeal knowledge'[151] of distinct characteristics of a material. Edwin Garrigues Boring examined this knowledge and the idea that haptic perception involves a more complex spatial experience that involves the use of many senses all at once, and thus gives us this internal knowledge.[152] When Delorme wrote that a proper understanding of the art of cutting stones could only truly be derived from 'having made the effort' to cut and construct them, he conveys his understanding of this unique awareness and knowledge that can only be obtained through exerting physical energy, or effort, which provides this internalised knowledge. Delorme, the son of a master mason, acquired this knowledge of stonecutting already as a youth and what his continuous efforts gained him is, as I argue here, is what constitutes having a sense of mastery of a spatial activity, and thus of space. Mark Paterson recently wanted to rediscover how touch was forgotten and whether we could learn geometry with our eyes and hands.[153] His aim was, he writes, to 'reveal the underlying haptic aspects of spatial experience', because touch had been deliberately 'written out of' Western cultural history and thus actively forgotten.[154] Given that Delorme lived right on the threshold of this change, it is all the more interesting to find evidence from his text, about this awareness before it was actively forgotten within the discipline of architecture.

In the mountaineering literature in the late nineteenth century, a similar kind of awareness about the role of the body is obvious from reading the texts, but unlike Delorme, corporeal experiences are elaborately described within the texts. This was, at least partly, due to the fact that some of this literature was not instructional in the sense that Delorme's was and that they found more room for experimentation and, as

[151] Marie Eithne O'Neill, 'Corporeal Experience: A Haptic Way of Knowing'. *Journal of Architectural Education*, 1, 55 (2001), p. 4
[152] This is what Edwin Boring (1886-1968) refers to as 'somathesis'.
[153] See Mark Paterson, 'The Forgetting of Touch – Re-membering Geometry With Eyes and Hands', *Angelaki - Journal of Theoretical Humanitites*. 3, 10 (2005)
[154] Paterson, 'The Forgetting of Touch – Re-membering Geometry With Eyes and Hands', p. 115

a result, to describe it there. Leslie Stephen's *The Playground of Europe* provides us perhaps with the best example of this. Stephen describes, in detail, some of the ways in which a climber utilizes his body as a tool to negotiate the difficult sections of a climb. However, in Stephen's text below, for example, the description was not intended as technical advice or as instruction that could form a systematic theory. Nevertheless, it explains in some very direct terms those practical methods where the climber makes use of the body almost as an instrument to solve spatial problems:

> I was forced to wriggle along a steep slope of rock where my whole weight rested on the end joints of my fingers inserted into certain pockmarks characteristic of this variety of rock, and, to be candid, partly on my stomach. This last support gives very efficient aid on such occasion.[155]

To rest one's whole weight on 'the end joints of [his] fingers', and partly on his stomach, illustrates the intensity of the physical energy that is exerted in order to climb this particular part of the rock. His verbal description thus serves to demonstrate the techniques climbers would employ, and in this way it provides the reader with good practical advice not otherwise available.

In three of the first instructional books: Clinton Thomas Dent's *Mountaineering* (1892), Frederick Burlingham's *How to Become an Alpinist* (1912) and Geoffrey Winthrop Young's *Mountain Craft* (1920), however, we find the first evidence of attempts at theorising these practical methods and the body as an instrument to solve spatial problems. Their manuals attempted to include these practical methods and systematise them so as to be included in the instructional literature that now emerged. This is especially evident in chapters that grapple with the techniques of rock climbing, and although rock climbing formed into an independent sport it nevertheless was a large part of what mountaineering was. Earlier in the nineteenth century these kinds of techniques were ignored and it was not until writers such as Stephen that they were now seen as serious techniques that should be formulated into a theory.

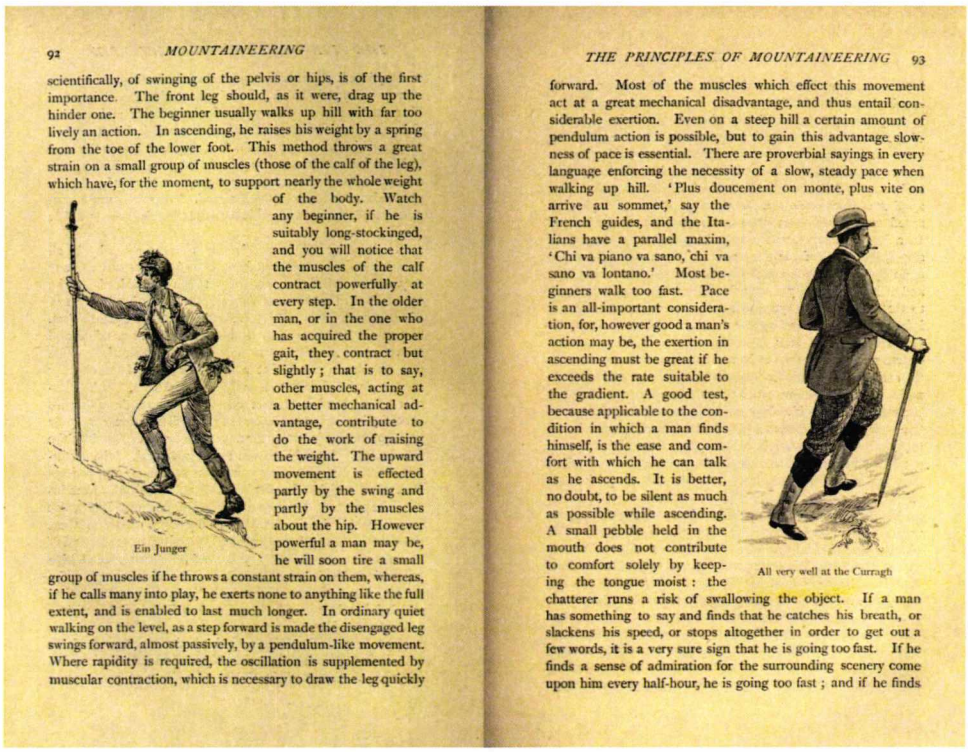
[155] Stephen, *The Playground of Europe*, p. 219

The body in measuring space

In the first of these books to be published, Clinton Dent commented that the

> infinite variety of movement constitutes a great charm in rock climbing, but renders the task of describing it in words almost hopeless.[156]

These kinds of bodily movements, such as the ones described by Leslie Stephen, had almost certainly represented only a 'charm', to borrow Dent's word again, in the early 1900's, but it was at that time not something that would constitute part of a body of techniques. Evidently, Dent argued that it was the difficult task of translating it into verbal description that ultimately caused these to be included in what was, perhaps, much less detail than he would have liked it in his book. However, this cannot be argued to be the primary reason to exclude it in the earlier literature, since, if they had found 'movement' to be the main source of a theory of climbing techniques, they would almost certainly have made the effort to describe them.



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scientifically, of swinging of the pelvis or hips, is of the first importance. The front leg should, as it were, drag up the hinder one. The beginner usually walks up hill with far too lively an action. In ascending, he raises his weight by a spring from the toe of the lower foot. This method throws a great strain on a small group of muscles (those of the calf of the leg), which have, for the moment, to support nearly the whole weight of the body. Watch any beginner, if he is suitably long-stockinged, and you will notice that the muscles of the calf contract powerfully at every step. In the older man, or in the one who has acquired the proper gait, they contract but slightly; that is to say, other muscles, acting at a better mechanical advantage, contribute to do the work of raising the weight. The upward movement is effected partly by the swing and partly by the muscles about the hip. However powerful a man may be, he will soon tire a small group of muscles if he throws a constant strain on them, whereas, if he calls many into play, he exerts none to anything like the full extent, and is enabled to last much longer. In ordinary quiet walking on the level, as a step forward is made the disengaged leg swings forward, almost passively, by a pendulum-like movement. Where rapidity is required, the oscillation is supplemented by muscular contraction, which is necessary to draw the leg quickly

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forward. Most of the muscles which effect this movement act at a great mechanical disadvantage, and thus entail considerable exertion. Even on a steep hill a certain amount of pendulum action is possible, but to gain this advantage slowness of pace is essential. There are proverbial sayings in every language enforcing the necessity of a slow, steady pace when walking up hill. 'Plus doucement on monte, plus vite on arrive au sommet,' say the French guides, and the Italians have a parallel maxim, 'Chi va piano va sano, chi va sano va lontano.' Most beginners walk too fast. Pace is an all-important consideration, for, however good a man's action may be, the exertion in ascending must be great if he exceeds the rate suitable to the gradient. A good test, because applicable to the condition in which a man finds himself, is the ease and comfort with which he can talk as he ascends. It is better, no doubt, to be silent as much as possible while ascending. A small pebble held in the mouth does not contribute to comfort solely by keeping the tongue moist: the chatterer runs a risk of swallowing the object. If a man has something to say and finds that he catches his breath, or slackens his speed, or stops altogether in order to get out a few words, it is a very sure sign that he is going too fast. If he finds a sense of admiration for the surrounding scenery come upon him every half-hour, he is going too fast; and if he finds

All very well at the Curragh

8 Clinton Dent's illustrations of walking techniques, 1892

[156] Dent, *Mountaineering*, p. 239

Nevertheless, Clinton Dent was the very first author to write a theory of mountaineering, and his manual did include some very important sections on the climber's movements, which clearly emphasises his awareness of its value as technique. Chapter four in his book, called 'Principles of Mountaineering', contains two sections, one that describes the techniques of 'Walking up hill'[157] and another of 'Descending'.[158] Both sections describes in detail the techniques of walking:

> The essence of walking up hill [...] is the cultivation of a quiet swing and a methodical rhythm of gait. A certain slight degree of roll, or, to put it more scientifically, a swinging of the pelvis or hips, is of the first importance.[159]

The passage shows that the climber's body and his movements were by now seen in the wider mountaineering community as being enormously important to the craft of climbing and thus having substantial enough value so as to be fully worthy of a more technical consideration and analysis in a manual such as Dent's. As a result an increasingly growing attention to the body and its movements were more often verbally described in the texts and could thus be studied in a more systematic and methodical way.

When Edward Whymper wrote in his book *The Ascent of the Matterhorn* that 'walking is an art'[160], he probably did not anticipate that it was indeed an examination of how to walk and other movements on the rock that later was to formulate much of the contents of the technical manuals on mountaineering.[161] Accordingly, by the time Young wrote his *Mountain Craft*, it was widely understood that every type of sport 'had the movements of the body and their perfecting skills as basis.'[162] Evidently, then, by the time Young wrote his book, the knowledge that the body itself was the main source from which to find technical solutions to the complex spatial problems of how to safely and effectively climb mountains, had become common awareness, whether it was gained through reading about climbing, through practical experience, or indeed both. As climbing increased 'its desire for discovery', Young writes, 'it had to invent a new rock technique to solve the new problems.'[163]

[157] Dent, *Mountaineering*, pp. 91-96
[158] Dent, *Mountaineering*, pp. 96-100
[159] Dent, *Mountaineering*, p. 96
[160] Whymper, *The Ascent of the Matterhorn*, p. vii
[161] This was also the period that Geoffrey Winthrop Young later called 'the walking epoch', Young, *Mountain Craft*, Charles Scribner's & Sons, p. 141
[162] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 139
[163] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 139

These new techniques could, then, satisfy this desire to solve new problems. Young who reflected on this progress that had taken place within the history of climbing, states that the most important cause behind this progress was 'the study of the possibilities of balance in motion, and the training of the hand and the eye'.[164] Chapter four in Young's book, on 'Rock Climbing',[165] offers a large number of these technical descriptions. In the chapter, individual sections for how to move different parts of the body are dealt with, such as: 'The Use of the Foot', 'The Ankle', 'The Knee' and 'The Hand'. The most important contributions to a modern techniques guide lies in this last section, on 'The Hand'. It constitutes what we see in contemporary climbing manuals today; the 'Cling Holds' and the 'Push and Press Holds' to mention a few. One particularly succinct description of a type of cling hold, called 'under-hold', reads:

> [...] the hand, gripping palm upwards under a down-turned edge or point, is getting security and propulsion by pulling the body inwards against the upward thrust of the balance from the feet.[166]

It is now evident that the two disciplines moved in separate directions. When touch, during Delorme's time, was written *out* of architectural history, and thus actively forgotten, touch was now actively written *into* mountaineering history.

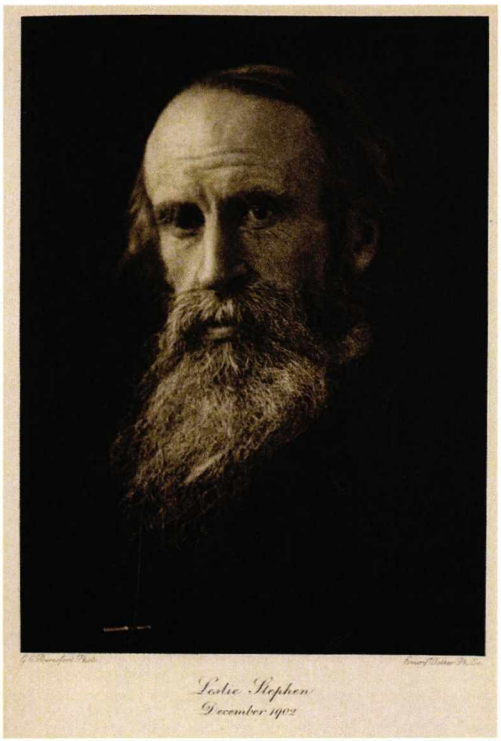
As the two disciplines break apart and sets off separately, there is in the discipline of mountaineering a growing awareness of the role of the body and sensory experiences as the main source of understanding space and be able to solve, and thus master, space and spatial problems. Leslie Stephen wrote for example that one of the primary accomplishments of a mountaineer was to be able 'to measure that magnitude [of the mountain] in terms of muscular exertion instead of bare mathematical units.'[167] Throughout Stephen's book there is evidence of a deep fascination with the idea of measuring space with the body and also with the ways in which a climber has the ability to translate meaningless rows of numbers into units of measure that through this other, and more tangible method, is nevertheless capable of being measured through perception.[168] This means that a spatial property such as 'steepness', for example, is measured through sensuous experience, rather than through its equivalent

[164] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 140
[165] Young, *Mountain Craft*, Charles Scribner's & Sons, pp. 138-172
[166] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 162
[167] Stephen, *The Playground of Europe*, pp. 276-7
[168] Stephen, *The Playground of Europe*, p. 278

unit of measure for planar angles in geometry, the 'degree'.[169] Stephen writes about this in a section of his book that is worth quoting in length:

> the advantages of the mountaineer are obvious. He can measure those qualities on a very different scale from the ordinary traveller. He measures the size, not by the vague abstract terms of so many thousand feet, but by the hours of labour, divided into minutes – each separately felt – of strenuous muscular exertion. The steepness is not expressed in degrees, but by the memory of the sensation produced when a snow-slope seems to be rising up and smiting you in the face; when, far away from all human help, you are clinging like a fly to the slippery side of a mighty pinnacle in mid-air.[170]

In this passage, Stephen points out precisely what the difference between theoretical knowledge and practical experience is, that the first is riddled with spatial qualities that can only have 'vague abstract terms', whereas the second is defined through direct and distinct sensuous experiences.



9 (Left) Leslie Stephen with guide Melchior Anderegg, c. 1870

10 (Right) Portrait of Leslie Stephen by Emery Walker, 1902

169 Stephen, *The Playground of Europe*, p. 281
170 Stephen, *The Playground of Europe*, p. 281

The Alps were for Stephen, indeed a 'playground', but as his friend Douglas Freshfield remarked, it was also his 'cathedral'.[171] Stephen, an author and literary critic, did not immediately go to the Alps with the spirit of a mountaineer, but was soon 'bitten' and, as Stephen himself writes, the Alps cast a spell upon him.[172] 1858 was his year of 'apprenticeship' with his most favoured guide, Melchior Anderegg (pictured with Stephen above in figure 9), and in the years to follow he made many first ascents.[173] Indeed, between 1855 and 1894 Stephen made 25 visits to the Alps, and the knowledge with which he wrote of 'measuring' the mountain with the muscles and the 'memory of a sensation' was founded upon extensive personal experience and not upon theoretical knowledge. Having climbed with most of the 'old masters'[174] Stephen himself became a 'master of all kinds of mountain craft', James Bryce said in a speech to the Alpine Club after Stephen's death in 1904[175] and continued that Stephen's climbing accounts 'originated a new way of treating the Alps'.[176] Clinton Dent accordingly wrote that much of the literature that was written after Stephen could be traced back to his writings.[177] If his influence was so great, Stephen must have also influenced the ways in which the climbing manuals developed theories that focused more closely upon the role of the body.

The ability to measure spatial properties through the senses and the muscles, which Stephen described, is the phenomena we refer to today as kinaesthesis, also called muscle sense, and proprioception: the sense of the relative position of parts of the body. More precisely, kinaesthesis is the 'sense of muscular effort that accompanies a voluntary motion of the body' and also 'the sense or faculty by which such sensations are perceived,'[178] whereas proprioception is 'the perception of the position and movements of the body'.[179] This type of knowledge has, despite many attempts to understand it in a wide range of theoretical disciplines, such as cultural history and

[171] Frederic W. Maitland, *The Life and Letters of Leslie Stephen*. (London: Duckworth & Co., 1906), p. 79
[172] Leslie Stephen, 'In Praise of Walking' in Hilaire Belloc, *The Footpath Way. An Anthology for Walkers* (London: Sidgwick & Jackson, 1906), p. 205
[173] Maitland, *The Life and Letters of Leslie Stephen*, p. 83
[174] Maitland, *The Life and Letters of Leslie Stephen*, p. 100
[175] Maitland, *The Life and Letters of Leslie Stephen*, p. 95
[176] Maitland, *The Life and Letters of Leslie Stephen*, p. 101
[177] Maitland, *The Life and Letters of Leslie Stephen*, p. 102
[178] See entry for 'kinaesthesis, *n.*', in *Oxford English Dictionary Online* <http://dictionary.oed.com> [accessed 24 July 2012]
[179] See entry for 'proprioception, *n.*', in *Oxford English Dictionary Online* <http://dictionary.oed.com> [accessed 24 July 2012]

architectural theory, to mention a few,[180] persisted to remain excluded from the practical aspects of disciplines such as architecture up until the present time. Recently, Marie Eithne O'Neill wrote about this problematic within architectural practice and education and explains succinctly that 'bodily effort involved in moving across a landscape [...] provides internal corporeal knowledge of the slope or texture of the terrain,' which summarises what kinaesthesis is, whereas proprioception is the experience of the 'angle of [our] joints and the disposition of [our] bones'.[181] The spatial perceptions gained through these haptic senses, she argues, is still being ignored and she points out that design education is, even a generation after the seminal book *Body, Memory and Architecture* by Kent Bloomer and Charles Moore was published in 1977, still preoccupied with only one type of sensual experience; the visual. The problem, she says, lies in the fact that the rewards in architectural education and practice are primarily based upon appearances. 'What gets in the way of new thought', she argues, 'is the guiding assumption that the inherent identity of a place *can* be identified by only visible formal elements'.[182]

Ways of communicating and representing architecture are, in part to blame; their unpopulated and uninhabited spaces do not encourage much attention on experience. Anthony Vidler, in a study of unhomely houses,[183] discusses the well known story by E.T.A Hoffmann called 'Councillor Krespel' (or Rat Krespel),[184] who built a house based entirely upon non-visual information. The story describes Krespel, the councillor, and the methods he employed whilst building his private house. It was built entirely without drawings nor with the use of architects. Instead, he hired a number of builders whom he provides only with a series of verbal instructions, one at a time. He begins by asking them to build the walls of the house and they work on the walls of the house, precisely as Krespel has asked them to do, until he calls out at the moment when the walls are at a height that he feels comfortable with. A complex process of triangulation followed, where Krespel paces up and down the garden in all

[180] See for example: Juhani Pallasmaa, *The Eyes of the Skin. Architecture and the Senses.* (Chichester: John Wiley and Sons, 2005). Juhani Pallasmaa, *The Thinking Hand. Existential and Embodied Wisdom in Architecture.* (Chichester: John Wiley and Sons, 2009). David Howes (ed), *Empire of the Senses: The Sensual Culture Reader.* Oxford; New York: Berg, 2005). Mark Paterson, *The Senses of Touch: Haptics, Affects and Technologies.* (Oxford; New York: Berg, 2007)

[181] O'Neill, 'Corporeal Experience: A Haptic Way of Knowing', p. 4

[182] O'Neill, 'Corporeal Experience: A Haptic Way of Knowing', p. 3

[183] Anthony Vidler, *The Architectural Uncanny. Essays in the Modern Unhomely.* (Cambridge, Mass.; London : MIT Press, c1992), pp. 17-44

[184] E.T.A Hoffmann, 'Councillor Krespel', *Tales of Hoffmann* (Harmondsworth, England: Penguin Books, 1982), pp. 159-185

possible directions towards the house until he *felt* where the front door should go, and the builders accordingly, cut a hole for the door. The process continued inside the house, with the same process of pacing up and down the rooms until he found, what he felt was the best place for the windows and doors and so forth. The house, once completed possessed 'from the outside [...] the craziest appearance, since none of the windows, for instance, was of the same size or shape as any other, but once inside you were filled with a quite unexampled sense of wellbeing and comfort'.[185]

We may have supposed, Vidler argues, that the story represented a restoration of the wisdom of the craft guilds,[186] but Hoffmann's story was in actual fact an exploration of the relationships between the familiar and the strange, the homely and the unhomely.[187] Krespel, 'by repressing the full faculties of sight' and behaving like a partially blind man, creates peculiarities about the house that can only be described as unhomely, Vidler writes.[188] Although his discussion around Hoffmann's tale is based upon these unhomely associations, I would like to argue here that it is just as important to follow the line of reading that, although Hoffmann perhaps was satirizing the nineteenth century idea of a 'natural architect', his tale presents us with something important that contemporary architecture often forgets, that the design of a building is felt, rather than seen. Leslie Stephen's writing, which was published about 60 years after Hoffmann's story, described this kind of feeling with acute precision and his argument was that, like Krespel, a mountaineer was privileged to have this skill. Likewise, in the passage by Benfield, which we saw earlier, the stoneworker knows precisely when to apply the last blows with the hammer. The skill that they all share is a very special kind of spatial awareness, which only experience can teach. But this knowledge, based upon sensuous experience, both architecture and mountaineering were struggling to part with in writing. If movement was difficult to describe, as Dent pointed out, it would be even more challenging to create a body of rules and principles to form a theory of sensory experiences.

In Delorme's work, although we saw in the previous chapter that he made an enormous effort at creating a set of principles and rules of the craft of stonecutting in

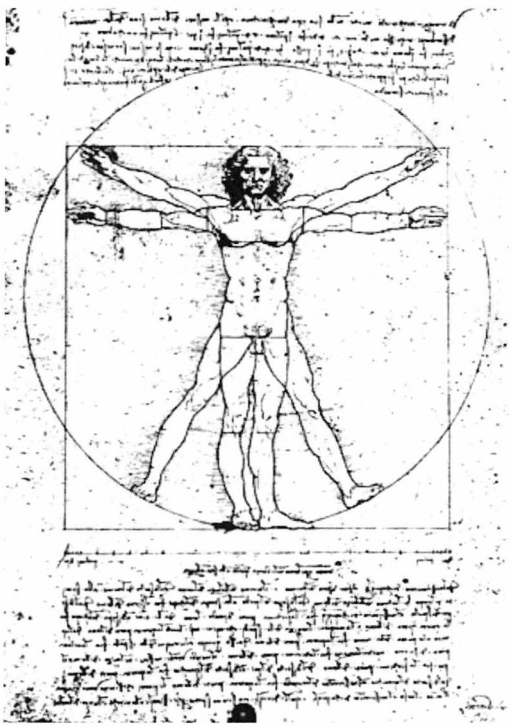
[185] Hoffmann, 'Councillor Krespel', p. 161. Vidler provides perhaps a better translation of this in *The Architectural Uncanny. Essays in the Modern Unhomely*. p. 30: 'a most unusual appearance from the outside – no two windows being alike and so on – but whose interior arrangements aroused a very special feeling of ease'.
[186] Vidler, *The Architectural Uncanny*, p. 30
[187] Vidler, *The Architectural Uncanny*, p. 27
[188] Vidler, *The Architectural Uncanny*, p. 33

theory, the reality was that *in practice* it was a craft that relied more upon the kinds of sensory experiences as described in the story about Krespel. It is this difference that is especially intriguing in Delorme's work, because whilst the mountaineers evidently also applied onto practice their written theories, this was not the case with the stonecutters who continued to rely on the approximation and intuition of the master craftsman.[189] From the representations in Delorme's treatise, his stone constructions seemed as if they were well planned, with a set of complex drawings, and there seemed to be a set of systematic procedures to follow as described in detail in the written text. In the procedures that are recorded in written text and drawings, Delorme's work appears on the whole a far reach from the ones that Krespel implemented above, but looking closer at the procedures that Delorme's stonecutter operated by, it is clear that these methods were in actual fact not too distant from the ones used by the stonecutter. However, as we saw, there was very little evidence within the written text and drawings of these methods.

At times, Delorme describes architectural elements which ordinarily would have concrete measurements but that do not have definite numbers in his treatise, rather they are described as how ratios of parts relate to a whole. Although the idea of proportional relationships are a well known tradition during Delorme's time, both in the arts as well as in architecture, it does nevertheless represent the idea of a certain approximation that was a powerful part of the Renaissance consciousness. In describing one of his cuts, Delorme writes for example that the stonecutter should 'draw [...] the thickness of the vault, as wide as you may wish' and further on 'in as many parts as it may please you.'[190] This is continuously repeated throughout Book III and IV, and there are only a handful of places where an absolute idea of numbers presents itself,[191] such as in the word 'fathom'.[192] He writes for example that '[w]orkers call it a talus when the thickness of the wall becomes less as it rises, as would be the case with a tower that is two fathoms thick at the foundation, but at a height of four or five (fathoms) becomes only one fathom thick.'[193] This word, 'fathom', means quite literally the distance between the fingertips of a man with outstretched arms[194], and is

[189] Perez-Gomez, *Architecture and the Crisis of Modern Science,* p. 229
[190] Delorme, *Le Premier Tome de l'Architecture,* both fol. 68r/p.167
[191] Delorme, *Le Premier Tome de l'Architecture,* fol. 78v/p.188
[192] *Fathom* is translated from the French word *toise.*
[193] Delorme, *Le Premier Tome de l'Architecture*, fol. 78v/p. 188
[194] See entry for 'fathom, *n.*', § 3b, in *Oxford English Dictionary Online* <http://dictionary.oed.com> [accessed 22 July 2012]

an indication first, of a very abstract idea of numbers, but since this measure had of course a real number attached to it,[195] it does nevertheless suggest a measure that is not dependent on number, nor is it a measure based upon bodily exertion such as what we saw in Leslie Stephen's example above, but a measure that depends upon approximations and intuition. It suggests a relationship both between body and material as well as between practical and theoretical geometries.



11 Leonardo da Vinci's 'Vitruvian Man', c 1509

In this way, Delorme's work is consistent with the Renaissance analogy to the body, where the building derived both its proportions and its composition from the human body, a notion that was celebrated through the figure of an outstretched man known as the Vitruvian man. Vitruvius, Hanno-Walter Kruft writes, 'attempted to establish a connection between man, geometry and [...] number'.[196] Vitruvius

[195] 1 fathom equals 6 feet, See entry for 'fathom, *n.*', § 3b, in *Oxford English Dictionary Online* <http://dictionary.oed.com> [accessed 22 July 2012]
[196] Kruft, *A History of Architectural Theory From Vitruvius to the Present*, pp. 27-28

describes this anthropometric method of finding harmonious proportions in his *De Architectura libri decem* (*Ten Books of Architecture*) written between 33 and 14 BC:[197]

> Similarly, in the human body the central point is naturally the navel. For if a man lies flat on his back with arms and legs outspread and a circle is described with the point of a compass placed where his navel is, the fingers and toes of his hands and feet will touch the circumference of the circle. And just as the human body will give a circle, it will also give a square. For if we measure from the soles of the feet to the top of the head and then compare that measurement with the span of the outstretched arms, width and height will be found to be equal, as in an area set out with a builder's square.[198]

Man was the measure of all things and Vitruvius formed the natural background to architectural theory during the Renaissance. Delorme, writing during a period when these ideals of Vitruvius were re-ignited, accordingly refers to Vitruvius no less than 97 times throughout his treatise.[199]

For Vitruvius, the idea of symmetry and proportions were based upon what he refers to as a 'painstaking exactitude'.[200] In the work by Delorme this exactitude was reflected in his use of the classical orders, as we will see in his drawings of entablatures, pilasters and other detailing. However, stonecutting as a new construction technique allowed new architectural forms to be created and these techniques for building vaults and arches remained imprecise. As Sakarovitch explained, it was a slow 'back and forth'[201] process of trial and error rather than a process of following exact procedures and measurements. Nevertheless, in the work of Delorme's stonemasons, the practice of how parts relate to the whole is clearly visible in his treatise and although their practice was deeply rooted in geometry, the practice of cutting stones was as imprecise as his text describes. Unlike Alberti who wrote extensively on the relationship between the human body and the building, Delorme did not write about this relationship although it is clear that the tradition is nevertheless inscribed within his practice.

[197] Kruft, *A History of Architectural Theory From Vitruvius to the Present*, p. 21
[198] Vitruvius quoted in Kruft, *A History of Architectural Theory From Vitruvius to the Present*, pp. 27-28
[199] See for example Delorme, *Le Premier Tome de l'Architecture*, fol. 1v, 2r, 9r, 10r, 14r, 16v, 28r, 35r, 36v, 47v, 62r, 134r, 134v, 138r, 142r, 143v, 144v, 144r, 148v, 150r, 155r, 156r, 157r, 160v, 162r, 162v, 163r, 166r, 168r, 172r, 172v, 174r, 175r, 175v, 179r, 179v, 195r
[200] Vitruvius quoted in Kruft, *A History of Architectural Theory From Vitruvius to the Present*, p. 27
[201] Sakarovitch, 'Stereotomy, a Multifaceted Technique', p. 3

Between toe, finger and eye: towards a measure of the eye

Another important aspect of practical experience within architecture in the sixteenth century and mountaineering in the nineteenth centuries is the role of the eye in the implementation of their craft activities, and also the relationship that the eye had to the body. Geoffrey Winthrop Young describes, for example, the connection between the hand and the eye and how important this is to climbing:

> The lines of communication between toe and finger and eye, with the brain as clearing-station, have to be opened up or be re-opened. The ability to compensate, by the balance of the body, between hand and foot hold, and to relate the process to the task of selecting holds in anticipation with the eyes, has to be acquired or regained.[202]

What Young is saying here, is that the climber's movements rely upon a continuous exchange of information 'between toe, finger and eye' and that these signals go via the brain, which acts as a 'clearing-station' between the three, that is, as a controller of the communication. Once 're-opened' and there is a flow of information between 'toe and finger and eye', Young says, the climber will be able to balance his body. The selection of holds are done 'in anticipation with' the eyes.

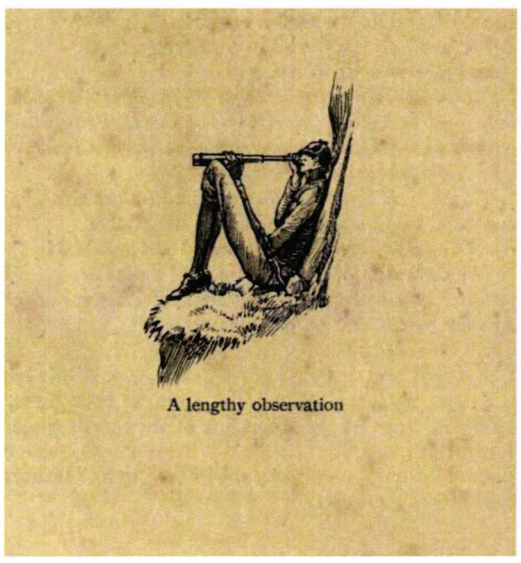
In a later passage in Young's book the relationships are unmistakably complex because, as he says, the process of selectivity is one that only can be implemented by using ones eyes, by seeing. Accordingly, Young writes that

> [t]hey [the hands] are under the constant direction of the eye, and therefore do not need the same training in automatic movements to carry out anticipatory judgements.[203]

Although the hands connect directly with the material through touch and transmit often unconsciously felt vibrations as in Benfield's example earlier and provide knowledge about the material that the eyes alone can never acquire, it is nevertheless the eyes that *direct* the movements of the hands, and as we will see, also the feet. In this way what Young's text implies, is that the eyes in many ways control the climber's activities. As a result the hands 'do not need the same training' in what he calls 'automatic movements', implying that the eyes do, something which perhaps explains how they literature is more focused upon explaining the practice of 'reconnoitring' than with actual physical movements.

[202] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 148
[203] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 161

Young's passage thus underlines Delorme's earlier statement about the dominion of the eye in the practical implementation of solving geometrical problems. Clinton Dent also wrote a similar passage in his earlier book *Mountaineering* that '[t]he eye can help the foot more than the hand.'[204] The extracts from Dent and Young's texts are particularly interesting because the mountaineering literature during the late nineteenth century and at the turn of the twentieth century seemed to move away from the systematic visual observations using tools on site. Instead, gradually, they became increasingly conscious of the body and its role in mastering spatial activities and thus also the mountain. What Dent and Young suggests is that visual observations, such as those executed during 'reconnoitring' should not depend entirely upon instruments but upon the 'unaided eye'. In so doing, and in developing a real trust in the seeing eye, the hands become submissive of the eyes. The eyes ultimately must make the selections of holds on the rock, and it is thus also the eyes that needs training in order to move across the rock as swiftly and effectively as possible, selecting hand and footholds that can best create an uninterrupted flow of climbing movements. However, these accounts of the eye represent a somewhat different theory about climbing than the haptic methods seen earlier.



12 'A lengthy observation', an illustration from Clinton Dent's *Mountaineering*.

[204] Dent, *Mountaineering*, p. 224

In *The Playground of Europe*, Leslie Stephen mentions the use of the clinometer, an instrument that measures the angles of slopes. Stephen was, during this later phase of the nineteenth century, the last of a tradition of mountaineers whose interest in the mountain included the use of instruments to survey and measure the mountain form.

> One or two measurements with a clinometer of Mathews' gave inclinations of 51° or 52°, and the slope was perhaps occasionally a little more.[205]

Stephen's passage represents a very small number, perhaps the only example in his text, where he measured the slope's angle using instruments on site and it is worthy of note that the clinometer was Mathews', as he says, and not his own. In another section of the book, Stephen remarks that those mountaineers who associated alpine travelling with this tradition of systematic observations and thus with science, were 'fanatics'.[206] This emphasises Stephen's position as having departed from the traditions by the members of the Alpine Club, many of whom still showed an enormous interest in the science of mountaineering by measuring the mountain form.

Stephen, however, made a considerable effort in his book to prove the use of these instruments useless. He states, as an example, that he did not have a thermometer, but promptly afterwards suggests that the temperature was 'approximately 212° (Fahrenheit) below freezing'.[207] Stephen continues that he did not have an aneroid barometer to judge the correct altitude and, 'as for ozone', he writes, 'if any existed in the atmosphere, it was a greater fool than I take it for'.[208] Stephen's book ridiculed those climbers who he believed were excessively preoccupied with studying the mountain through these systematic observations using instruments. He attempted to demonstrate that observations based upon approximations nevertheless provided the climber with sufficient knowledge from which to make informed judgements during the planning and execution of a climb. As discussed earlier, Stephen had a fascination and personal interest in the haptic experiences and ways of gaining knowledge of a space and spatial activity through haptic means and wrote accordingly that mathematical measures were 'a measure which we have learnt to despise.'[209]

[205] Stephen, *The Playground of Europe*, p. 126
[206] Stephen, *The Playground of Europe*, p. 107
[207] Stephen, *The Playground of Europe*, p. 108
[208] Stephen, *The Playground of Europe*, p. 108
[209] Stephen, *The Playground of Europe*, p. 275

For John Tyndall however, a physicist who is best known for his research on glaciers, his journeys to the mountains were entirely motivated by scientific research and thus his observations were of the same systematic nature that Stephen condemned. On the first page of Tyndall's book *Hours of Exercise in the Alps*, he writes:

> I do not think that I could have filled my days and hours in the Alps with clambering alone. The climbing in many cases was the peg on which a thousand other 'exercises' were hung.[210]

Tyndall represents the kind of climber, whose calling as a mountaineer was motivated by scientific research. However, there was a whole other tradition of mountaineers who were neither scientists nor preoccupied with the role of the haptic methods of measure, such as we saw in Leslie Stephen's example. Some were indeed using science as an excuse to pursue their travels, whereas for others who climbed simply for the sake of the climbing knew that they had to learn certain methods of observation in order to learn how to climb. This training included learning to understand what those observations seen with ones eyes meant.

Alfred Wills' book *Wandering Amongst the High Alps* provides us with a good example of a tradition of observations that belonged more to the scientific type. Early on in the book, he describes an occasion when he was 'surrounded by ice on every side'[211] and that he uses the thermometer to measure the temperature. This is written partly in the same sense that we saw scientists like Tyndall would record his observations. However, the question is somewhat more complex than this simple distinction, as an example in the following passage from Wills' book draws out. Wills here tries to ascertain the angle of the mountain and to assess the level of difficulty that the path ahead will bring:

> A few paces after starting, when we were clear of the rocks, I ascertained the angle of the slope, by planting my alpenstock upright, and measuring the distance from a given point to the slope, in two directions, vertically and horizontally. I found the two measurements exactly equal; so that the inclination of the glacier was 45°; but at every step it became steeper; and when at length, we reached the others, and stood, one below another, close to the base of the cornice, the angle of the inclination was between 60° and 70°![212]

[210] John Tyndall, *Hours of Exercise in the Alps* (New York: D. Appleton and Company, 1897), p. v
[211] Wills, *Wanderings Among The High Alps*, p. 11
[212] Wills, *Wanderings Among The High Alps*, p. 293

What Wills' passage demonstrates is how instruments used to measure the mountain are instruments that can, in a way, test the eyes. At the very least, it is a method of learning to trust what it is he actually sees with his eyes. What all these examples have shown, are the remains of a tradition of climbing that was motivated primarily by science and their methods of measuring, to one that gradually began to learn to trust the eye as an instrument alone.

This idea developed alongside the growing awareness about the body as a powerful sensory receptor that they had to learn to trust, that it was an instrument to measure space and spatial activity. As such the body thus came to form part of their growing repertoire of climbing techniques. Wills continues that

> We did not venture to use our telescopes, as we did not wish to run any chance of weakening the steadiness of the eye, on which we had still much to depend.[213]

This example from Wills' text emphasises the argument that they were in a process of learning to trust what they could see with their own eyes and illustrates also how Wills felt that using the telescope was a risk in that it could weaken their confidence in the eye. This shows how Wills had developed an assurance in the information that observations made with his eyes alone could provide him with, and it was because of this that he chose not to use the telescope.

As Robert Silverman has argued, studying nature by using instruments such as the telescope can 'never provide a neutral mediation between observers and the world'.[214] During the early nineteenth century there were a number of publications that 'exalted' the idea that the eye was the 'ideal optical instrument'[215] and the high number of references to this idea in the mountaineering literature suggests that such a conception of this argument was well known by educated mountaineers such as Wills. The telescope and other instruments for making observations was, then, already at Wills' time being made redundant as a climbing tool, although as we have seen, there are a large number of climbers who recorded the use of them up until the turn of the twentieth century.

[213] Wills, *Wanderings Among The High Alps*, p. 300
[214] Robert J. Silverman, 'The Stereoscope and Photographic Depiction in the 19th Century', *Technology and Culture*, 4, 34 (1993), pp. 729-756
[215] See for example William Paley, *Natural Theology*, (New York: American Tract Society, 1882) and Peter M. Roget, *Animal and Vegetable Physiology Considered with Reference to Natural Theology*, (London: William Pickering, 1834)

The trained and experienced eye

Leslie Stephen examines the difference in visual perception between the inexperienced and what he calls the 'experienced eye'. He describes, for example, the way in which tourists generally perceives a buttress to be a perpendicular rock structure. However, although this is believed to be true by the inexperienced climbers and tourists observing the mountain from a distance, the visual field is nevertheless deceptive to the tourist eye:

> the long slopes of debris by which it is faced prove the fallacy of this idea to an experienced eye, and it is, in fact, easy to ascend [...].[216]

The tourist's inexperienced eye, then, hovers over what it sees, but does not know what it sees. This tourist gaze that Stephen describes is an indication of a distrust in the eye that was comparable to the apprentice mountaineer's. This distrust in the eye was, as we saw, also one of their motives to use instruments to analyse and measure the visual field. The instrument being a tool that they could trust because they believed that 'unaided vision'[217] was not able to make as accurate a judgement of the visual space. What Stephen's passage emphasised, and that Wills also expressed, was that the mountaineers had to develop trust in their own eyes. The knowledge of the visual field and what they perceived through their eyes had to be acquired through the senses, that is, through practical experience instead of the more abstract, and distorted, way of looking through the telescope. This means that what the eye sees is an assessment of the visual field based upon prior physical experience, or effort, of the same, or similar, fields.

There was, then, an increasing awareness that the 'experienced eye' had no need for instruments to measure the visual field and acquire knowledge about the mountain form. As Wills stated above, the instruments were unreliable because the visual field was deceptive and reading it depended instead upon physical experience. That is why Wills, who analysed this relationship, records the moment of surprise that he experienced when the slope he had measured to be around 45° from the distance in actual fact was somewhere between 60° and 70°. Experienced mountaineers were aware of the often-deceptive visual field in the mountain space; and that, vice versa, something seen from one perspective as 60° or 70° is just as often nearly horizontal

[216] Stephen, *The Playground of Europe*, p. 116
[217] Whymper, *The Ascent of the Matterhorn*, p. 45

seen from a different view. There was, then, a whole tradition of writing about the development and process of learning to trust the eye, and eventually the confidence they had in the eye as a tool to perceive the visual field developed, which we see during the mid nineteenth century. However, although the physical senses, as Diemberger wrote earlier, are very actual and real experiences that could more easily be trusted whereas the visual sense, which is always open to misinterpretation, was not, this development was also one that occurred with the other physical senses that we discussed earlier.

Delorme, as well as drawing attention to the role of the physical effort that was exerted by referring to 'experience', 'labour' and 'effort' throughout his treatise, also puts emphasis on the visual aspect of the craft, but by placing a very different emphasis between hand and eye than the mountaineers. By extending the interpretation of a practical knowledge of geometry and the knowledge he had of physical effort and haptic ways of measure to now also include the visual, Delorme thus added another essential part of the technical repertoire of stonecutting. This is particularly evident in a paragraph from Book IV, below, where Delorme writes that

> it is difficult to explain it better than by actual practice, showing the hand and eye how the stones are to be traced and assembled.[218]

By using the words 'hand and eye',[219] Delorme draws our attention to the fact that the processes of stonecutting were based both upon haptic as well as visual methods in order to learn how to trace and assemble the stones.

However, the passage does not refer to the actual cutting of the stone, instead, what he points out above is how the stones are to be 'traced and assembled' and this is because the most important part of stonecutting in practice consists of the process of making connecting lines between the drawing and the stone, the hand merely being guided by the eye. This is essentially the same as what Young wrote that the hands 'are under the constant direction of the eye', as we saw above. We understand, then, that in the passages throughout his treatise where Delorme refers to 'actual practice', as above, or in passages where he writes that he needs to 'show [the cut] manually',[220] it did not always follow that he meant the act of cutting and thus the haptic experience,

[218] Delorme, *Le Premier Tome de l'Architecture*, fol. 108r/p. 247
[219] Delorme uses here 'hand' and 'eye' as singular, as though the consideration that we see through two eyes was not important, nor did it seem important to him that we have two hands. The same is true of the mountaineering literature.
[220] Delorme, *Le Premier Tome de l'Architecture*, fol. 112v/p. 257

but that he instead meant the connection between the hand and the eye, as well as a predominantly visual experience and understanding of the craft.

The actual connection between hand and eye existed materially through the use of the compass, the stonecutter's most important tool. In another passage Delorme brings out this relationship between eye, compass and hand particularly clearly:

> I know truly that many gentle workers will immediately understand these cuts simply by casting their eyes upon them, and having the compass in hand will easily find the relationships [...].[221]

Delorme explains that the stoneworker, just by this momentary glance at the drawing, is able to understand what his eyes sees in two dimensions and that he will immediately be able to translate these lines and 'find the relationships' which enables him to trace them onto the stones with his compass 'in hand', the compass representing this direct connection between hand and eye.

By the middle of the century, the mountaineers had learnt to understand that 'reconnoitring', a survey of the mountain and the route they intended to climb, was a critical part of being able to plan safe and enjoyable routes on the mountain, but that the surveys depended upon a belief in unaided vision. The 'advice simply is to look at the peak before they try to climb it',[222] Dent writes in 1892. However, by the time Dent wrote his book he complained that this tradition of surveying unfortunately was a thing of the past, that all the standard expeditions were, by then, 'either known to the guides, or minutely laid down in descriptions of previous ascents', and that a study of the broad and general view of the mountain was thus being ignored.[223] A mountaineer, he writes

> is frequently at a loss if he endeavours to trace out from a distance a route which he has followed [...] He will sweep all over the mountain with his telescope, in the hope of lighting on tracks or ice-steps. [...] Satisfied with the reflection, often insisted on, that appearances are deceptive through the telescope, he will lay it by and remain in sublime and contented ignorance of what he has done, and of what he has been looking at.[224]

Thus Dent, who published his book 36 years after Wills', also seemed preoccupied with the idea of visual deception by studying nature with optical instruments such as the telescope.

[221] Delorme, *Le Premier Tome de l'Architecture*, fol. 61v/p. 153
[222] Dent, *Mountaineering*, p. 129
[223] Dent, *Mountaineering*, p. 130
[224] Dent, *Mountaineering*, p. 130

Silverman argued that nineteenth century writers 'debated the merits of using this technology to surpass the capacity of the human eyes,' but that they 'established the human eyes as the ideal instrumentation for visual representation'.[225] The idea of an 'innate fidelity of the eyes' seemed to capture the attention and imagination of the authors of mountaineering well into the twentieth century. Young writes for example that

> a mountaineer who has trained his eye by first going round to see a number of such slopes in profile, and by then returning to see them in face, has learned what he must deduct from an apparent angle. He is then qualified to make a truer estimate of the real angle of slopes which he may be able to examine in face alone.[226]

Young emphasises throughout his chapter on reconnoitring the significance of training the eye, and he complains that 'maps and guide-books relieve the mountaineer of almost all occasion to apply his powers of observation',[227] a loss which Young regards as 'considerable'. The 'trained eye'[228] should thus also be able to confirm 'what is beyond his sight', and this depended upon an ability to understand the 'signs' that are within his view. As Young writes, the 'power to estimate the angle of a slope by the eye only comes with practice'.[229]

Therefore, the 'effective mastery' of reconnoitring rests upon 'previous accumulation of practical experience'.[230] Young describes thus 'the well-meaning but aggravating importunity of an elder walking companion: 'Can't you see that ?' and, 'What does it mean ?' and, finally, 'Well, then, I'll tell you !'.[231] This experience was what Leslie Stephen supposed when he wrote about the 'experienced eye',[232] as we saw earlier. Stephen's 'experienced eye' did not depend upon optical instruments in order to acquire knowledge about the mountain form, but instead that the 'experienced eye' indicated previous experience, which affected the way the eye sees – and more importantly what it sees.

The mountaineer with an 'experienced eye' is thus able to 'reconstruct' the visual field, or see, what Young calls 'the Unseen'.[233] This reconstruction is possible if

[225] Silverman, 'The Stereoscope and Photographic Depiction in the 19th Century', p. 734
[226] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 375
[227] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 370
[228] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 371
[229] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 375
[230] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 370
[231] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 372
[232] Stephen, *The Playground of Europe*, p. 116
[233] Young, *Mountain Craft*, Charles Scribner's & Sons, pp. 391-396

an 'expert eye' is able to interpret the visual 'signs' and convert them into information about the 'Unseen'. Clinton Dent wrote that there

> is no actual need in known districts to reconnoitre every peak or pass that the mountaineer intends to ascend or cross; it will be possible to get up the mountain or over the pass without any preliminary survey. But the practice may be turned to good account some day, and the man who delights in learning all that can be learnt on the spot will never fail to make the best of his opportunities for comparing a previous estimate with the actual experience."[234]

Dent thus believed that reconnoitring should be practiced as often as possible, even in known districts because it may be 'turned to good account one day', as he writes. Then, as Young later argued, one may be able to, in unknown regions, interpret the signs of the 'Unseen'.[235]

These signs consists, for example, of being able to determine from the look of the colour and tone of the sky what the unseen part of the mountain consists of, whether it is a large rock wall, snow slope or field of ice.[236] Other signs include being able to interpret air currants and shadows. There is reassurance, Young writes,

> in the perception that oncoming shadow, by its very quality of darker relief, can reveal to us some unsuspected and relenting aspect in the daunting precipice across our path[237].

Although Young seems to recognise 'the power of sight',[238] and the role of the 'eye' in observing the visual field as distinctly separate from using optical instruments, he does nevertheless reveal on a couple of occasions within the text some doubt in the 'innate fidelity' of the eye. 'Sunny days, patience and good glasses', he writes, are the 'first conditions' for the practice of reconnoitring.[239] Young's concern is with those who are unaware of problems with their eyesight, even if 'only slightly astigmatic' and his advice - to wear 'corrective glasses' - should be of a 'type that gives enhanced stereoscopic effect'.[240] His comment reflects a field of interest in the stereoscope shared by universities as well as popular entertainment during the second half of the nineteenth century.

[234] Dent, *Mountaineering*, p. 131
[235] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 391
[236] Young, *Mountain Craft*, Charles Scribner's & Sons, pp. 392-393
[237] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 396
[238] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 396
[239] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 395
[240] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 395

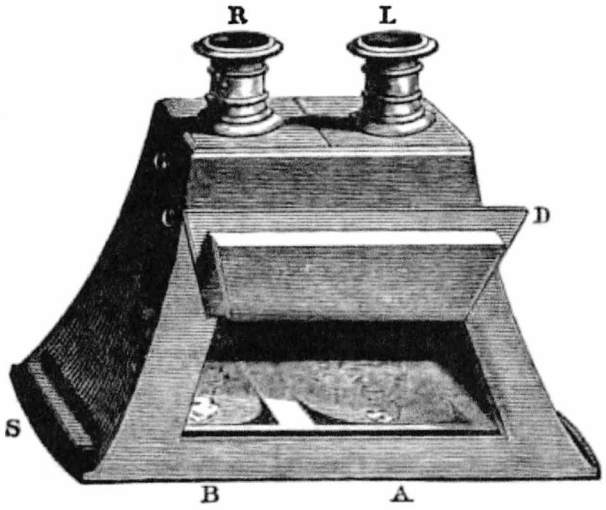


FIG. 14.

13 Brewster's stereoscope

The stereoscope is a device that resembles a pair of binoculars. It shows two pictures of the same scene, taken at slightly different angles. The two pictures are viewed concurrently; one picture with each eye, and this creates an illusion that the scene is three-dimensional. As Wheatstone, the British physicist argued in 1838, 'the mind perceives an object of three dimensions by means of the two dissimilar pictures projected by it on the two retinae'.[241] The stereoscope therefore mimicked binocular space perception, and thus as Silverman argued, the stereoscope served as a tool for the study of vision.[242] However, by looking through a telescope, the observer was only able to see the landscape with one eye, and looking through its lens created the problem of foreshortening, something commented on frequently in the mountaineering literature of the nineteenth century. This does also explain why the mountaineers during this period wrote about the 'eye' – singular, rather than eyes - plural, although with the general acceptance that looking through a telescope gave a distorted view one would suppose they would rather emphasise this binocular vision and use eyes rather than 'eye'. The clue to this may lie in Wheatstone's discovery that

[241] Silverman, 'The Stereoscope and Photographic Depiction in the 19th Century', p. 729
[242] Silverman, 'The Stereoscope and Photographic Depiction in the 19th Century', p. 730

> the mind fathoms visual space by combining the information from a pair of two-dimensional, monocular pictures.[243]

Prior to Wheatstone 'several individuals had observed', Silverman writes, that in 'binocular vision, the two eyes receive slightly different images'.[244]

The use of the stereoscopic metaphor is reflective of the authors concerns with the perception of depth and Young's text above with wearing 'corrective glasses' is directed at this. If one is not able to view depth properly, then the whole premise of being able to understand the 'Unseen' falls apart. In Delorme's text the eyes play a crucial part in being able to understand the spatial relationships between the geometric forms of the stones. That is why in Delorme, the eyes are central in directing the hands. For the mountaineers, each eye has a significant role in perceiving depth and it is presumably also why in the mountaineering literature the 'eye' is discussed as a singular despite being a reflection on the role of both eyes in depth perception. Interestingly, although Philibert Delorme mostly referred to 'eye' - singular, repeatedly throughout his treatise, even he would at times refer to the use of both eyes. It is not entirely clear why the mountaineers placed such emphasis on the eye – singular – but what is clear is that the role of vision, whether it is referred to as 'eye' or 'eyes', played a significant role in both discipline's attempts to master their spatial activities and thus also their space and that the perception of depth formed a significant part of this.

Conclusion

This chapter has looked at the two discipline's views upon the value of practical experience versus theoretical knowledge. It examined what practical experience consisted of, that it was essentially two techniques that depended upon both haptic and visual experience of activity and space, and that their methods of implementation into practice had to be learned. These techniques were paramount in order to measure space and thus grasp, or master, their spatial activities.

I have argued that perceptions of the body changed over the course of the nineteenth century, from being almost entirely excluded from the literature to becoming a focal point for climbing techniques. Leslie Stephen had an enormous

[243] Silverman, 'The Stereoscope and Photographic Depiction in the 19th Century', p. 729
[244] Silverman, 'The Stereoscope and Photographic Depiction in the 19th Century', p. 729

influence in changing the mountaineers perceptions of the body in this respect and it was this change that later manifested itself in the manuals by Dent and Young. With the introduction of the first manuals in architecture in the fifteenth and sixteenth century, however, the body was instead written *out* of the texts. We saw that although the Vitruvian idea of man as the measure of all things was resurrected and although this was based upon a certain level of exactitude, the idea of approximation and processes based upon trial-and-error remained not only within the stonecutters practice, but traces of this practice is also evident in Delorme's treatise.

Although the disciplines' perceptions of the body differed, both expressed a deep confidence in the role of the eye as another practical instrument to measure. The chapter examined the two disciplines' views on its role within practical experience and that, like bodily movement, the eye had to be trained to *see*. In the discipline of mountaineering had to develop a sense of trust in what the 'unaided eye' could see, something that became one of the most important techniques for the climbers. In the nineteenth century we saw how, for example, the climber's hands and feet were seen as being under the constant direction of the eye. Although the role of the eye was important to the sixteenth century, it was not in any way related to the submissiveness of the body to the eye like the mountaineering texts suggested. Instead, 'hand and eye' were practical tools that each seemed equally important in the craft's practice as the other.

In this way, whilst the nineteenth century wrote the body *into* their manuals, the sixteenth century attempted to write the body *out of* theory. Nevertheless, body and eye remained intrinsic to the two disciplines' practical techniques, and for their sense of mastery of their craft.

3

A Setting in Stone

Graphic Description as Technique

The last chapter demonstrated two disciplines' views upon practical versus theoretical knowledge, it analysed the two key features that formed the centre of practical knowledge: haptic and visual perception – and how these were discussed in their texts. These practical experiences formed a vital part of the technical repertoires of both Philibert Delorme and Geoffrey Winthrop Young. The second part of this last chapter examined the role of vision and studied the role of the aided and the 'unaided eye'. In the mountaineering literature this was evident through how a training of the eye could help to understand the 'unseen' aspects of their space and thus develop a trust in what the unaided eye could see. It thus seems natural to extend the previous discussion on the visual to now also include the role of graphic descriptions. By 'graphic' I take distance from the 'verbal' descriptions which will be discussed in the next chapter, and will here concentrate upon representations such as sketches, drawings, paintings and photographs and how these functioned as a distinguishing feature within the two discipline's bodies of techniques. This chapter will examine the two disciplines' views upon the role of graphic descriptions and through doing so unravel the practice involved in producing them and also how they provided essentially two things in order to develop a sense of mastery: first, information about the object in space and second, information about the spatial activity. This information, provided via graphic means, is the third technique in a growing repertoire that the two disciplines used to develop a sense of mastery of their crafts and the spaces they climbed and built.

In architecture during the Renaissance, the use of drawings as the main source of spatial information flourished and an interest in this growth of graphic, rather than verbal, information has been the source of a vast body of research in the centuries that followed. What is less known however, and which has not been part of this body of research is the function that these graphic sources of information had in developing an understanding of and a feeling that their craft and the spaces that the craftsman occupied had been mastered. Although Delorme did not devote distinct space in his treatise to discussing the role of drawings, his position on their value as a source of spatial information is nevertheless evident within his text. We will see how the role of description as a tool to provide information about *space* through graphic means in the discipline of mountaineering is much less familiar than in architecture, whereas providing information about a *spatial activity* through these kinds of descriptions, however, is something we are more accustomed to seeing in the mountaineering literature but not in the architectural treatises. The mountaineers who attempted to write instructional manuals on mountaineering in fact devoted whole chapters to the use of graphic sources of information and therefore placed emphasis on its singularity as well as its role within their practice. In the mountaineering literature we will see a more direct link between their use of graphic descriptions and their understanding of its role in developing a sense of mastery of their space. This link, which is less evident in the discipline of architecture, will nevertheless become clearer by reading one practice through the eyes of the other, that is, by reading the practice of building through the practice of climbing.

In architecture the focus will be solely upon the use of drawings, whereas in mountaineering, the role of photography will also be examined because this had become a common form of providing information graphically during this time. The graphic descriptions in this chapter are connected to two distinct functions that they have, first as a source of spatial information and second as a source of learning how to do a spatial activity. In this way graphic descriptions assist the disciplines in the two essential methods that are integral to their activities, first in their attempt at learning to understand the shape and form of the object itself: the mountain and the building, and second, in learning the methods of climbing and building. Thus this chapter takes distance from the notion of sketches, drawings, paintings and photographs as aesthetic records of their object, but focuses instead on a type of description that provides spatial information through these graphical means. This is also primarily why I have chosen

to use the word 'description' instead of 'representation', because what the chapter focuses upon is how spatial information is explained and delivered, or narrated through graphic means, in such a way that spatial knowledge is enhanced. We will see what value both disciplines attached to these descriptions and in what way they were used as practical applications to the two crafts. Consequently we will then be able to see the role graphic descriptions had in both disciplines endeavour to develop a sense of mastery of the two spaces and spatial activities: buildings and mountains.

Learning to see and record – becoming professional

With the rapidly increasing number of architectural treatises being written during the fifteenth and sixteenth centuries and the prolific number of books published on mountaineering during the nineteenth century, which we saw in chapter one, a proportion of this material also contained a large number of drawings and other illustrations, which offers a rich material not to be ignored for the arguments in this thesis. In mountaineering the production of different forms of graphic description was initially driven by a desire to record the seen whilst on their travels to the Alps, simply as a way of bringing their experiences back home in a graphic form. Graphic forms of describing was a way of showing something without having to use verbal descriptions to explain, and essentially, it was something more of a proof than verbal narrations of a journey could provide. In architecture however, at least from the knowledge we have from the treatises, drawing was seen as a part of the necessary training to become an architect. Nevertheless, what both disciplines shared was that they only identified these graphic forms of describing as being a significant part of the practitioner's *training* when, in architecture, the practical treatises began to be written from about Filarete's time, and in mountaineering, the instruction manual began to develop. To understand how both practitioners trained to 'master' their craft and thus could be defined as professionals through using these graphic descriptions is significant to the understanding of what mastery is in this thesis. In the previous chapter we saw in what way the role of the eyes were important in learning to *see* during reconnoitring, but learning to see through the practice of reconnoitring was also inherently related to the *seen* – the space and the spatial activities they pursued. But first, how then, did graphic representations become so important to the two disciplines?

During the Renaissance, and especially from about the middle of the fifteenth century, architects stressed the importance of drawing as the 'first skill to be acquired by anyone aspiring to be an architect.'[245] Filarete recounts in his treatise a conversation around a dining table that

> one of the others who seemed to speak more seriously said, 'Don't talk that way, I think that anyone who wants to construct a building needs to know measure very well and also drawing in order to lay out a large house, a church, or any sort of building. I do not believe he could do it at all correctly if he does not have drawing, measuring, and the other things. I also believe that anyone who commissions a building should know these things.[246]

Filarete was amongst the first of the Renaissance architects to stress the importance of drawing in the training of the architect as a professional as opposed to an amateur, and Sebastiano Serlio, for example, chose to begin his treatise *Tutte l'opere d'architettura e prospetiva* with a section on the use of architectural drawing instead of the principles of architecture, which would have been more common during his time. Serlio's treatise was to have widespread success throughout Europe, as its many, and rapid, translations into Dutch, French and German shows.[247] As architectural historian Adrian Forty explains, this emphasis on drawing was entirely unprecedented and 'set a pattern followed by many in many subsequent architecture books'.[248]

The professional practitioner thus began to distinguish himself from the amateur, and graphic methods of describing space and spatial activity were an important and influential part in making such a distinction. Forty explains that, in the fifteenth and sixteenth centuries, 'what above all set the new genus of architects apart from the building trades was their command of drawing',[249] and because of drawing's connection with geometry this would have given architects the means by which to associate himself with abstract thought and thereby give architecture 'the status of intellectual, rather than manual labour'.[250] Drawing was fundamental to, and instrumental in, the transformation that took place during this time on how the architect was defined as a professional practice. Forty writes for example about Andrea

[245] Adrian Forty, *Words and Buildings: A Vocabulary of Modern Architecture* (London: Thames & Hudson, 2000), p. 30
[246] Antonio Averlino Filarete, Book 1, quoted in Harry Francis Mallgrave (ed.), *Architectural Theory. Volume 1: An Anthology From Vitruvius to 1870*, (Oxford: Blackwell Publishing, 2006), p. 36
[247] Kruft, *A History of Architectural Theory From Vitruvius to the Present*, p. 74
[248] Forty, *Words and Buildings*, p. 30
[249] Forty, *Words and Buildings*, p. 30
[250] Forty, *Words and Buildings*, p. 30

Palladio that it was, above all, his 'acquisition of the skill of drawing, which he applied to both recording what he saw and inventing anew, that lifted him out of the manual trade of stonemason.'[251] Palladio was, like Delorme, the son of a master mason, and the skill of drawing was something both of them benefited from in this respect. We have already seen in chapter one how the architect's training as an intellectual, a scholar and a theoretician, raised the discipline above the practice of the manual labourer, but it was drawing and the mechanical reproduction of drawings, that was to have such a crucial role in how the architect was now defined.

In the discipline of mountaineering we saw in chapter one that theoretical training created a discipline that had firm rules and principles that were systematised, and that this in turn helped define it as a discipline that also had intellectual value. However, very little, if any, recent scholarship has been focusing on the role of graphic descriptions as a *tool* in the repertoires of climbing techniques in the history of mountaineering. That is not to say that sketching, drawing, painting or photography did not exist as part of the practice of mountaineering, far from it, but the role that such descriptions had in the emergence of the profession is much less evident than it was for the architect in the fifteenth and sixteenth centuries. Clinton Dent's *Mountaineering* is, for example, the only book with a separate chapter on 'Sketching for Climbers', and that discusses 'its practical use for mountaineering purposes'.[252] The chapter not only discusses sketching, but indeed also landscape painting, which Dent believed was 'not nearly so much practiced at high levels as it should be',[253] because as he said, it was outside the scope of the Badminton Series of instructional books in sports.

Nevertheless, the fact that the topic of sketching had a major part in what was historically one of the first attempts at writing a manual on mountaineering thus suggested that drawing and other forms of graphic descriptions had an essential role for the mountaineers' training during this time. As part of his argument, Dent claims further that mountaineering was more than any other sport 'bound up inextricably with pursuits and studies of a graver kind',[254] thus proposing that the practice of representing the form of the mountain, especially through drawing and painting, placed mountaineering into a class where knowledge and learning governed the sport.

[251] Forty, *Words and Buildings*, p. 30
[252] Dent, *Mountaineering*, p. 380
[253] Dent, *Mountaineering*, p. 388
[254] Dent, *Mountaineering*, p. 388

It was this knowledge that entitled it, he writes, to the 'respect and devotion of sensible men'.[255] By this proposition, Dent thus placed mountaineering as an activity into a sphere of sophistication that other sports at the same time did not have. Graphic descriptions, like theory, thus created associations for both disciplines that they were indeed engaged in activities that were intellectual as well as manual.

Artists generally, Dent argues, were of the opinion that mountain scenery was 'not adapted to picture-making' because they would 'fear to tread the untried region'. Old masters such as Fra Angelico, he writes, 'did not rush in to the painting of glaciers'[256] and thus neither would the mountaineers. Although mountains at times presented

> [...] 'a typical fine-weather day', on which snow mountains do almost bruise the eye by their hardness, when distance, 'middle distance' (save the mark !), and foreground are all as flat and dull as bad stage scenery, and when all the senses of the little colour that exists is scorched out of the retina by two second's gaze at snow or white paper.[257]

But, Dent continues, '[m]ountain landscape is not to be judged by them [fine weather days] alone.'[258] Drawing and painting in combination with the activity of climbing was thus at one point as unlikely a combination as painting and building, but as Serlio pointed out at the beginning of Book II in his treatise, several great architects, such as Bramante, Raphael, Peruzzi and Giulio, had all 'started life as painters'.[259]

A number of such great painters spent a considerable time in the Alps in order to produce their pictures, but as Dent writes about mountaineers - '[c]ertainly, they would find it impossible to climb seriously and to paint seriously on the same day'.[260] Because of this difficulty with combining the two activities, it was thus photography that eventually was to attract the majority of their attention as a tool to study and describe the mountain form and thus it became a useful tool with which to pursue the activity of climbing mountains from about the end of the nineteenth century. Although it was drawing and painting that Dent focused on as essential parts in the mountaineer's training, he was very aware that photography was more easily within reach of people as a way of representing the mountain space and the activity of

[255] Dent, *Mountaineering*, p. 380
[256] Dent, *Mountaineering*, p. 389
[257] Dent, *Mountaineering*, pp. 389-390
[258] Dent, *Mountaineering*, p. 390
[259] Forty, *Words and Buildings*, p. 30
[260] Dent, *Mountaineering*, p. 390

climbing, but 'if the camera may speak, why not the paint-box?'[261], he writes. However, what the two types of graphic descriptions shared, Dent argued, was a collective 'aim at preserving some form of representation of the mountain world' even if they would only bear 'incidentally upon climbing pure and simple.'[262] However, this 'collective aim' that Dent described was ultimately intended at being more than simply a preservation of the mountain. We have seen that it was, like theory, a way in which the two disciplines were 'lifted' out of previously being associated with manual disciplines to ones that had stronger connections with knowledge and learning, but what, more precisely, did these graphic descriptions provide in more practical terms for the two disciplines' technical repertoires?

Drawing & photographing *space*

The literature examined in both architecture and mountaineering focuses almost exclusively upon describing space, or perhaps more precisely the object: the mountain or the building, in space. This section, and the majority of this chapter, will consider this most distinct type of images, those which describe, or attempts to describe, the form and shape of the space or the object within that space and the methods by which these images were obtained through surveying, or reconnoitring. By examining this practice we will see what role reconnoitring, and the descriptions that were produced, had in the emergence of the professional architect and mountaineer. Since becoming professional, as we have seen, was inherently related to gaining a sense of mastery of their crafts, we will thus be able to see how graphic forms of describing space were used as techniques to grasp, and thus master, space.

The practice of drawing as a tool to survey the mountain during the Golden Age of Mountaineering (1854-1865) manifested itself most explicitly in the work by John Ruskin and his seminal study of the shape and form of mountains in his book *Of Mountain Beauty*, the fourth volume in his five part series on *Modern Painters*. Ruskin, the great artist, art critic and aesthetic theorist, in this volume studied the form of mountains in extraordinary detail and used extensive verbal as well as graphical descriptions in order to represent the mountain's true form and in so doing created a landmark study of the methods entailed in reconnoitring and learning to

[261] Dent, *Mountaineering*, p. 388
[262] Dent, *Mountaineering*, p. 388

understanding a mountain's true form by using drawing as the main apparatus. Although the techniques that Ruskin employed have a strong connection to the techniques described in Dent and Young's chapters on reconnoitring, Ruskin's motive for drawing was not connected to a desire to climb mountains. Nevertheless, Ruskin's study challenged the general perceptions and misconceptions held by many during these prime years of mountaineering that a mountain was composed of steep, sloping sides which formed into a pyramid. But, as Ruskin points out

> it is curious how rarely, even among the grandest ranges, an instance can be found of a mountain ascertainably peaked in the true sense of the word, - pointed at the top, and sloping steeply on all sides.[263]

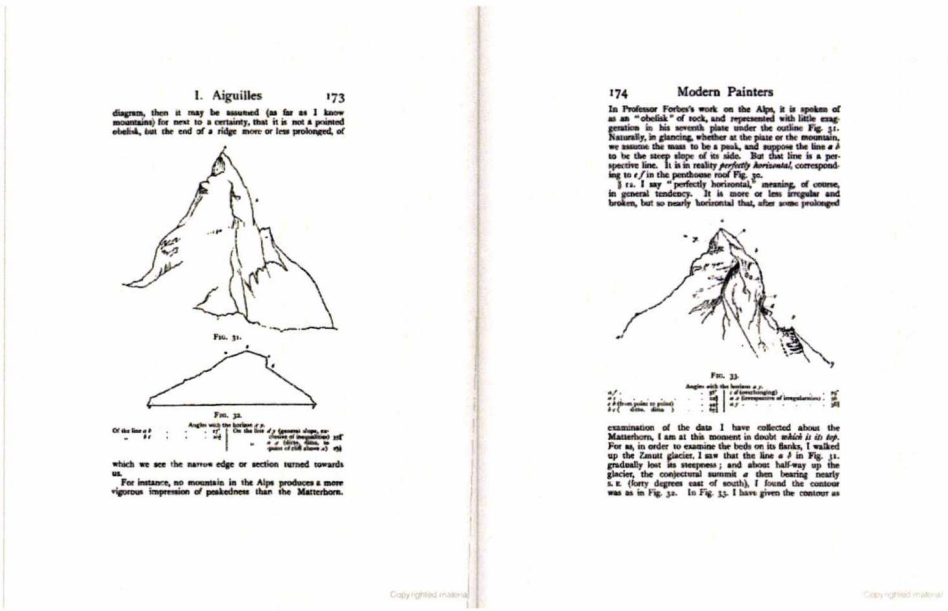
In the detailed study of the Matterhorn that followed, Ruskin proved this point with a series of detailed drawings of the mountains. '[N]o mountain produces a more vigorous impression of peakedness',[264] he writes, but the 'pyramidal form of the aiguille' is 'entirely deceptive.'[265] Ruskin's argument was the precursor to the later mountaineer's ideas, as we will see, that a true understanding of the form of a mountain depended entirely upon detailed studies of the same mountain from several perspective angles. The aiguille of the Matterhorn, Ruskin writes,

> seen in perspective, give[s] the impression of a steep slope, though in reality disposed in a horizontal, or nearly horizontal line[266].

Ruskin was not a mountaineer and he had in fact declined an invite to become a member of the Alpine Club,[267] but as Ruskin believed strongly that drawings and paintings should exhibit a detailed and truthful knowledge of nature, his drawings of mountains were influential to the generation of mountaineers during the period that followed. Even if his work was a Romantic study of painting, which focused on representing 'a truth of impression as well as form',[268] Ruskin's method of studying the mountain form in this way nevertheless led the way. His Campaign for Painting, and his 'belief in the value of training the hand and the eye'[269] is an idea that is apparent also in the later mountaineering literature and a Ruskinian method of studying the

[263] John Ruskin, *Modern Painters, Volume IV. Of Mountain Beauty* (London: George Allen, 1856), p. 187
[264] Ruskin, *Modern Painters*, p. 189
[265] Ruskin, *Modern Painters*, p. 195
[266] Ruskin, *Modern Painters*, p. 188
[267] Claire Engel, *Mountaineering in the Alps* (London: George Allen and Unwin, 1971), p. 113.
[268] Robert Hewison, 'Ruskin, John (1819–1900)', *Oxford Dictionary of National Biography*, in Oxford University Press, 2004; online edn, Jan 2010 [http://www.oxforddnb.com/view/article/24291, [accessed 11 June 2012]
[269] Hewison, 'Ruskin, John (1819–1900)', in *Oxford Dictionary of National Biography*

mountain became a critical part of becoming a good mountaineer, not just an illustrator, as we will now see.



1. Aiguilles 173

diagram, then it may be assumed (as far as I know mountains) for next to a certainty, that it is not a pointed obelisk, but the end of a ridge more or less prolonged, of

FIG. 31.

FIG. 32.

which we see the narrow edge or section turned towards us.

For instance, no mountain in the Alps produces a more vigorous impression of peakedness than the Matterhorn.

174 Modern Painters

In Professor Forbes's work on the Alps, it is spoken of as an "obelisk" of rock, and represented with little exaggeration in his seventh plate under the outline Fig. 31. Naturally, in glancing, whether at the plate or the mountain, we assume the mass to be a peak, and suppose the line *a b* to be the steep slope of its side. But that line is a perspective line. It is in reality *perfectly horizontal*, corresponding to *c f* in the penthouse roof Fig. 30.

I say "perfectly horizontal," meaning, of course, in general tendency. It is more or less irregular and broken, but so nearly horizontal that, after some prolonged

FIG. 33.

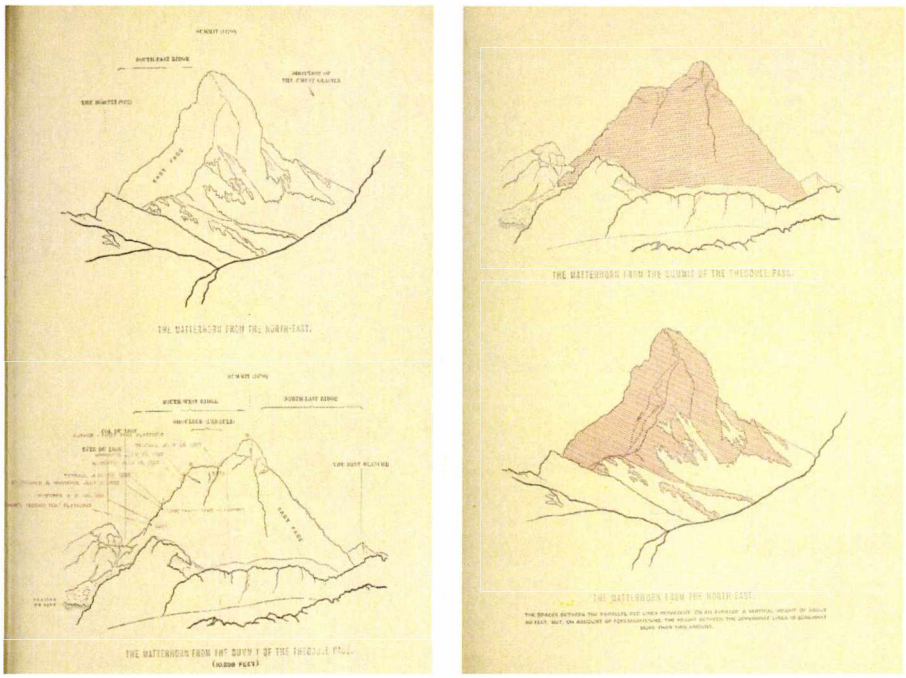
examination of the data I have collected about the Matterhorn, I am at this moment in doubt *which it is top*. For as, in order to examine the beds on its flanks, I walked up the Zmutt glacier, I saw that the line *a b* in Fig. 31, gradually lost its steepness; and about half-way up the glacier, the conjectural summit *a* then bearing nearly S.E. (forty degrees east of south), I found the contour was as in Fig. 32. In Fig. 33, I have given the contour as

14 John Ruskin's study of the Matterhorn, 1856

Twenty-four years after Ruskin's publication *Of Mountain Beauty*, Edward Whymper (1840-1911), who was a wood-engraver as well as a mountaineer,[270] made an almost identical study of Ruskin's favoured mountain, the Matterhorn, in his book *The Ascent of the Matterhorn* (1880). Whymper, who made seven attempts to climb the mountain, spent a considerable amount of time studying the mountain from all angles using effectively the same methods as Ruskin, above. 'Although this is the impression', Whymper writes, 'the fact is that the summit of the Matterhorn from this point makes an angle with the eye of less than 16°'.[271] Whymper thus makes the usual observations of angles seen in the majority of the climbing literature published in the nineteenth century, and which we saw in the previous chapter. However, where the earlier literature merely refers to their measuring of angles as part of their writing on climbing, Whymper's book differs from the earlier literature in that his studies of the Matterhorn was the principal interest behind both his climbing, drawing and his

[270] Peter H. Hansen, 'Whymper, Edward (1840–1911)', *Oxford Dictionary of National Biography*, Oxford University Press, 2004 <http://www.oxforddnb.com/view/article/36884> [accessed 11 June 2012]
[271] Whymper, *The Ascent of the Matterhorn*, p. 45

writing. The publisher William Longman's commission to illustrate the Alpine Peaks in 1860[272] seemed to be the background to Whymper's longstanding interest in the mountains. His mountaineering pursuits were almost entirely dominated by a quest to understand the true shape and form of the mountain by studying its appearance from different perspective angles, and his writings as well as his drawings are practically a copy of Ruskin's. This was also the case with the later drawings by H. G Willink which appeared in Dent's instructional book for the Badminton Library – as figure 17 and 18 shows.

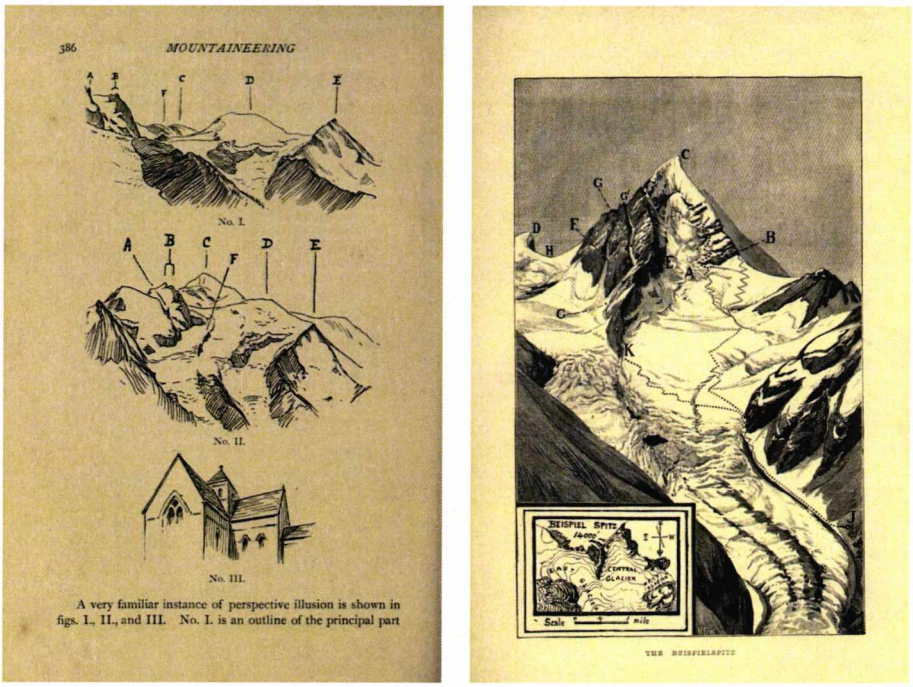


15, 16 Edward Whymper's study of the Matterhorn, 1880

These studies of the *shape* of mountains, such as by Ruskin, Whymper and Willink, were the most distinct and prominent examples of the use of drawings to study the mountain in the nineteenth century, and were without doubt the kinds of studies of the mountains Clinton Dent was referring to when he attempted to promote drawing as part of the practice of mountaineering in his chapters on reconnoitring and sketching. His use of Willink's illustrations in the chapter on 'sketching for climbers',

[272] See Whymper, *The Ascent of the Matterhorn*, p. v and Hansen, 'Whymper, Edward (1840–1911)', *Oxford Dictionary of National Biography*

seen in figure 17 and 18, confirms this. The practice of drawing for the mountaineers, then, was a method of learning to see the true shape and form of the mountain as a sum of first seeing the mountain from all angles and then assembling this information into a graphical description.



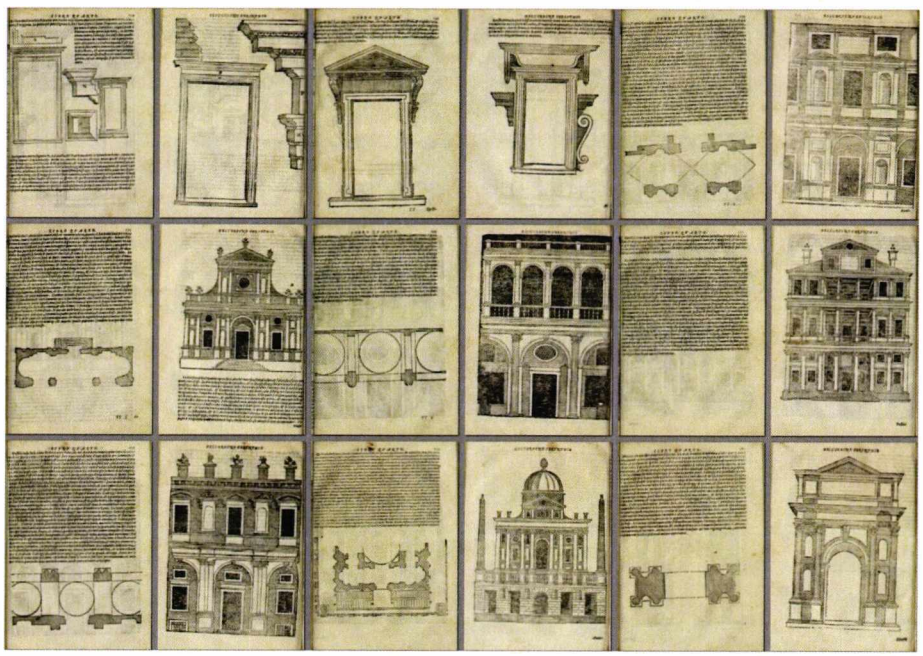
17, 18 H.G Willink's study of Mont Blanc (left), and the Beispielpitz (right), 1892

The revival and study of classical buildings which was common practice during Delorme's time, was a kind of a 'reconnoitring' of buildings in much the same way as how the mountaineers above studied mountains. During the Renaissance, architects such as Delorme made pilgrimages to Rome to study ancient buildings such as the Colosseum and the Pantheon and an essential part of an architect's training consisted in studying - that is physically measuring and drawing - the classical orders and architectural elements. As Delorme writes about the 'good' architect's use of his hands, with the one hand he 'pulls up the skirts of his robe, wishing to show that the Architect must be diligent in all activities' and

> with the other hand he holds and uses a pair of compasses around which a serpent is entwined, in order to signify that he must measure

> and compare all things and all works and constructions with prudence and mature reflection.[273]

That the architect, as he writes further on, 'must direct all his work (as we have said) by means of measurement',[274] is something Delorme repeats often, and is indicated by his familiar use of the term 'as we have said' - in brackets. These measurements, he says, are done with the compass, and those 'who has knowledge of the aforesaid drawing of lines', Delorme writes, 'certainly has no excuse for not being able to find an infinity of new and pleasing ideas'.[275]

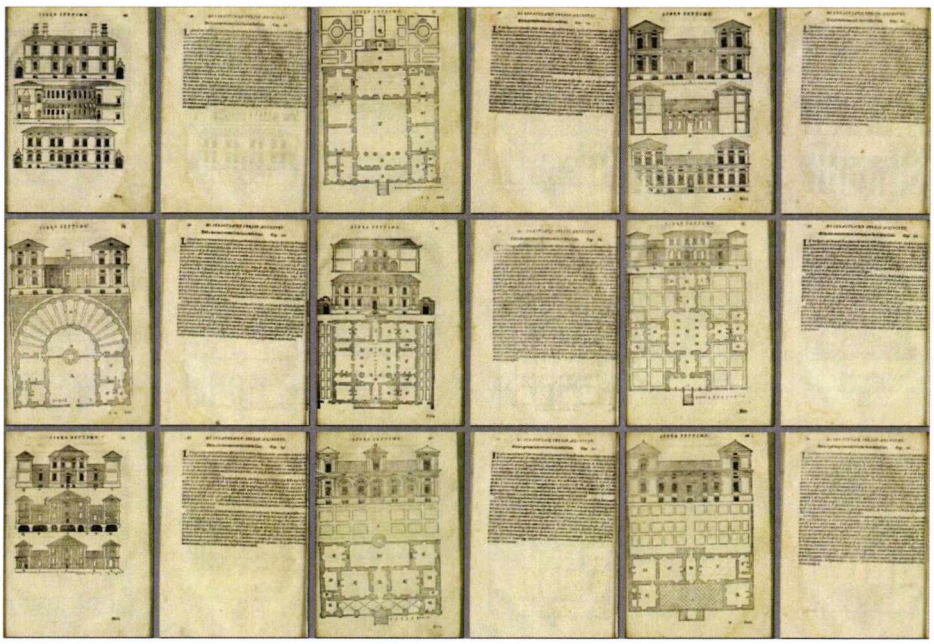


19 Serlio's study of the Corinthian order.

Drawing, then, was seen as imperative in both the study of existing and the design of new buildings. The best-known example of such a study is Sebastiano Serlio's treatise on architecture known by various names such as *L'Architettura*,[276] *I sette libri dell'architettura* or *Tutte l'opere d'architettura et prospetiva*, (written between 1537-1575) of which the most important Book in this respect was Book IV on the Orders. As we saw in chapter one, Serlio's treatise was that of the Renaissance treatises which, most

[273] Translation in Lefaivre and Tzonis, 'Philibert de l'Orme' in *The Emergence of Modern Architecture*, p. 143
[274] Translation in Lefaivre and Tzonis, 'Philibert de l'Orme' in *The Emergence of Modern Architecture*, p. 144
[275] Translation in Lefaivre and Tzonis, 'Philibert de l'Orme' in *The Emergence of Modern Architecture*, p. 145
[276] Kruft, *A History of Architectural Theory*, p. 74

notably, depended almost entirely upon graphic descriptions and became a sort of 'visual compendia'[277] with 'no theoretical commentary whatsoever'.[278] Serlio's books on architecture were a set of practical handbooks, which was a 'great novelty' during this time[279] and his heavy reliance upon illustrations in order to convey the 'rules' of architecture, seen in figure 19 and 20, was in great contrast to the earlier, theoretical work by Alberti.



20 Serlio's study of residential buildings

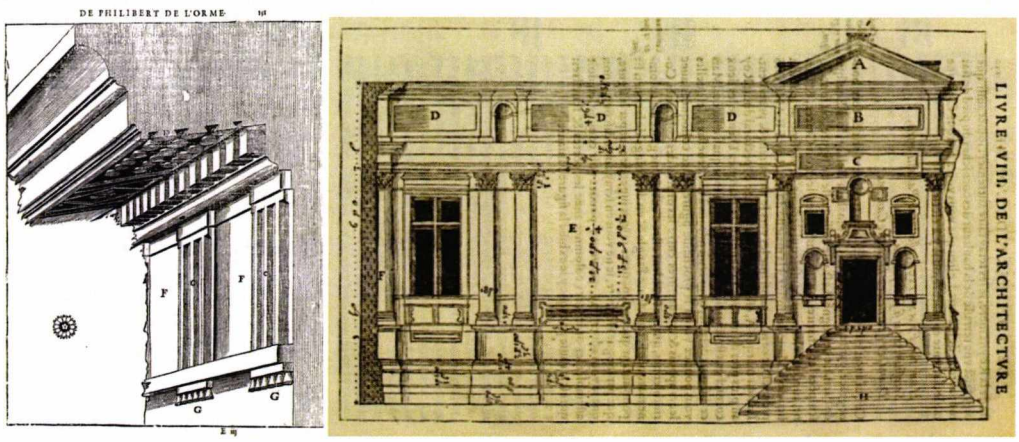
Delorme, like other Renaissance architects, also studied the classical orders, and made detailed drawings and measurements of columns, entablatures, pilasters, pediments, arches, and domes. In the next two figures (figure 21, 22) we see two such drawings, the first from Delorme's Book V, which studies the Tuscan, Doric and Ionic orders, and the second from Book VIII, which studies the organisation of the facade of classical buildings. These are examples of Delorme's work as an architect belonging to the Renaissance tradition of 'reconnoitring' – to use the mountaineer's term again – classical buildings. This tradition began with the first architect of this period: Filippo

[277] Ackermann, *Distance Points*, p. 363
[278] Lefaivre and Tzonis, *The Emergence of Modern Architecture*, p. 105
[279] Lefaivre and Tzonis, *The Emergence of Modern Architecture*, p. 105

Brunelleschi, and we can read in Antonio Manetti's well known bibliography of Brunelleschi's life (1480s) that he travelled to Rome and 'observed the method and the symmetry of the ancient's way of building'[280] and furthermore that he, together with the sculptor Donatello

> made rough drawings of almost all the buildings in Rome [...] with measurements of the widths and heights as far as they were able to ascertain [the latter] by estimation, and also the lengths, etc. In many places they had excavations made in order to see the junctures of the membering of the buildings and their type [...] When possible they estimated the heights [by measuring] from base to base for the height and similarly [they estimated the height of] the entablatures and roofs from the foundations. They drew the elevations on strips of parchment graphs with numbers and symbols which Filippo alone understood.[281]

During the Renaissance, this tradition of measuring and drawing was pursued by those architects whose treatises were modelled upon Vitruvius' treatise, such as Leon Battista Alberti, Antonio Filarete, Francesco di Giorgio, Sebastiano Serlio, Andrea Palladio, Giacomo Vignola, and Vincenzo Scamozzi,[282] although as we have seen it was Filarete who was to be the first to emphasise drawing as being an essential part of the architect's training.



21, **22** Delorme's drawing of an architrave of the Theatre of Marcellus in Rome – a study of the Doric order. (left) Delorme's study of the organisation of the façade of a classical building. (right)

[280] Mallgrave, Harry Francis (ed.) *Architectural Theory. Volume 1: An Anthology From Vitruvius to 1870* (Oxford: Blackwell Publishing, 2006), p. 28
[281] Manetti quoted in Mallgrave, *Architectural Theory*, p 29
[282] Mallgrave, *Architectural Theory*, p. 27

Even though Delorme rejected 'the strict adherence to Italian prototypes', Delorme's thesis did 'not display the explicitly anti-Italian features',[283] such as that of Jacques Androuet du Cerceau.[284] Delorme, along with du Cerceau, in actual fact played an important part in fully establishing the classical tradition within France and the tradition of measuring and drawing the buildings of classical antiquity was a strong feature in Delorme's treatise and, indeed, filled the contents of Books V-VIII. Delorme's drawings above are quite different from his stonecutting drawings, but they represent the tradition of reconnoitring well because they show a study of existing buildings rather than preconceived, or imagined, buildings – or parts of buildings. The mountaineer's tradition and training in 'reconnoitring' would thus be what architectural historians would refer to as the architect's tradition and training in the study of classical buildings 'first hand' through drawing and measuring.[285]

Thus, in order to become a professional architect and mountaineer there were expectations during both historical periods that they should study the form of the mountain or the building, not just by observation as we saw in the previous chapter, but also by graphically recording and describing the observed. However, although this was their ideal, there was a considerable difference in the number of actual studies carried out in the two disciplines. In architecture, these kinds of drawings of buildings were produced in a prolific number during the fifteenth and sixteenth centuries, whereas in mountaineering in the nineteenth century these studies of their object, the mountain, were in actual fact quite rare. Indeed, the drawings by Willink and Whymper, above, were the only studies of the mountain form in their books, whereas in books like Serlio's almost every single page contained drawn studies of buildings, as figures 19 and 20 show. This had, as we will see, a number of different reasons, such as that a mountaineer was not a skilled draughtsman and found it difficult to use techniques such as drawing, but it may also have been because unlike the architect, graphically describing their object probably did not seem to have a direct connection between the object and the activity. Possibly, it was not seen as a practical solution to their problems with space.

[283] Kruft, *A History of Architectural Theory From Vitruvius to the Present*, p. 119
[284] Liane Lefaivre and Alexander Tzonis, 'Philibert de l'Orme' in *The Emergence of Modern Architecture*, Routledge, London and New York, 2004, p. 131
[285] Kruft says for example that 'A number of the leading French architects spent several years of their lives in Rome, [and] studied Classical architecture first hand [...]', *A History of Architectural Theory From Vitruvius to the Present*, p. 118

'The alphabet of the language'

Young wrote, for example, that a mountaineer had to

> learn to see and to record all day and every day, not only distant signs for future use, but each and every detail of his surroundings. The detail may be forgotten, but its accumulation will gradually form in his mind a mass of general precedents and of knowledge of the characteristics of particular shapes and structures. This will remain with him, and will return instinctively to aid his judgement when some cognate detail presents itself to be interpreted as a piece of solitary evidence.[286]

The role of reconnoitring, as Young explained above, was for the mountaineers to learn to make judgements about what he saw based upon his recollections of what he had previously seen. Whilst here referring to the act of recording as a way of memorising these 'details of his surroundings', and thus also the idea that the details 'may be forgotten', graphic descriptions in the form of drawings and photographs provided the instrument that made it possible to record, and thus learn the 'characteristics of particular shapes and structures' via graphical evidence.

Learning to record 'every detail of his surroundings' served as a means by which to 'learn to see' and Young felt that if the mountaineer would 'record' his space he would be able to form a 'mass' of knowledge and a 'model' of the 'shapes and structures' of the mountain. Like Dent, who wrote in his chapter on sketching that 'most of this chapter must be read side by side with the chapter on reconnoitring',[287] Young did not exclusively think of memory when he used the word 'record' but also other forms of graphically recording and describing the mountain:

> it is well to memorize or sketch their position and extent beforehand, especially if we expect to have to cross them upon our descent, since they will be usually invisible from above.[288]

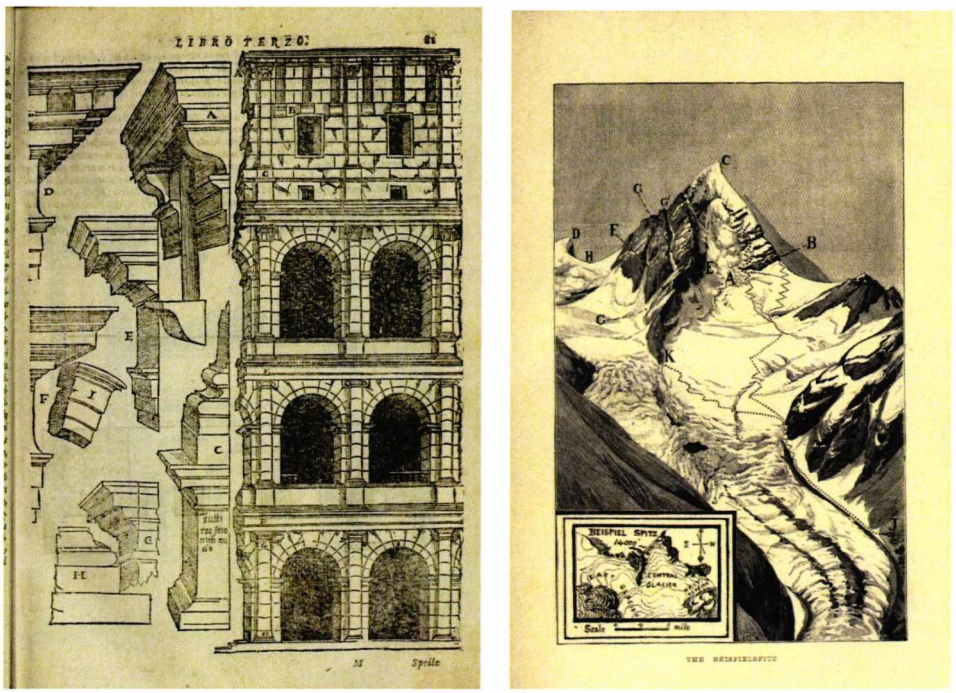
Dent indeed suggested that 'the merit of a sketch is in proportion to its success in supplying such a recollection'.[289] Methods of recording the mountaineers surroundings were thus seen as being a crucial part of the their training, but apart from the obvious fact that 'to record' helped them to remember and to provide graphic evidence, what more did these studies of mountains and buildings provide?

[286] Young, *Mountain Craft*, Charles Scribner's & Sons, pp. 395-396
[287] Dent, *Mountaineering*, p. 382
[288] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 381
[289] Dent, *Mountaineering*, p. 381

In mountaineering as in architecture, the graphic descriptions were the means by which the two disciplines could learn to recognise key features of the object, which, despite being directly in front of ones eyes, one had to be trained to see. As Clinton Dent points out, the

> lesson to be learned is writ large all over the field of view, but too few take the trouble to learn even the alphabet of the language in which it is set forth.[290]

But what, then, is this 'alphabet of the language' that Dent writes about? When Young wrote above about recording the details of his surroundings, it was in these details that the 'alphabet' was written. The climbers' quests were, like Serlio, to understand how the parts and features of their object: the mountain or the building, were distributed and arranged into a whole and both disciplines tried to systematise these 'details' into 'characteristics of [...] shapes and structures' or 'orders' and not all of this information could be taught by graphic representations alone, and they therefore developed a system that often relied upon the combination of both words and pictures. Serlio's drawing, seen in figure 23, and Willink's drawing, seen in figure 24, illustrates this.



23, **24** Sebastiano Serlio (left), H.G. Willink (right)

[290] Dent, *Mountaineering*, p. 130

What the two drawings above demonstrates is both literally and metaphorically an 'alphabet' of a language, which as Dent argued above, 'too few take the trouble to learn'. This was also Delorme's concern in his treatise, where he wrote that 'it is precisely here that I must raise my complaint, because today I do not see many workers making the effort to study and know that which concerns their estate'.[291] Both illustrations use letters, such as 'a', 'b', 'c', 'd', 'e', 'f', 'g', 'h' etc. in order to indicate the parts of the object (the building or the mountain), with each part being individually described in the accompanying text. Dent's text explains that point A in his drawing, seen in figure 24, is 'avalanche fragments seen at the base of the slope', B: is a 'small rock face', C: an overhanging 'eave or cornice', D: again; 'an eave or cornice', E: ' a great rock cleft', F and G: 'snow gullies' or 'couloirs' and H: a 'saddle'[292]. Similarly, Serlio's drawing, seen in figure 23, from his book on Roman architecture, also shows such a system.

However, there is one significant difference, in Serlio's drawing there is no direct link between the accompanying verbal description and the letters used in the drawing. Thus, it is not clear what 'A' is, nor what 'B', 'C' or 'D' may be, instead the drawing assumes upon the reader prior knowledge of architectural details and the ability to make, independently, a connection between the graphic and verbal description. It could thus be argued that the reliance upon graphic descriptions was so to a much greater extent within architecture than in mountaineering, otherwise Serlio would not have here trusted the reader to be able to draw from it the necessary information from his lack of direct verbal description of his drawing.

Nevertheless, what the two disciplines shared was a kind of 'alphabet' that both architects and mountaineers had to learn in order to master their craft thus consisted of a set of codes for communicating information about those *details* which, when combined into a whole, formed the *shape* of their object. The mountaineers, however, rarely recorded the mountain in 'minute detail' such as the architects did as seen in Serlio's drawing, figure 23, but rather kept their drawings in the form of a 'general outline' which consisted of 'skyline', 'main masses of rock', 'borders of glaciers', 'approximate snow-line', and 'special features'.[293] As Young wrote, the 'majority of men who climb the Alps or Britain get no practice in making even elementary deductions from scenic details within sight, and a number more, whose

[291] Delorme, *Le Premier Tome de l'Architecture*, fol. 57v/p. 145
[292] Dent, *Mountaineering*, pp. 138-141
[293] Willink in Dent, *Mountaineering*, pp. 384-385

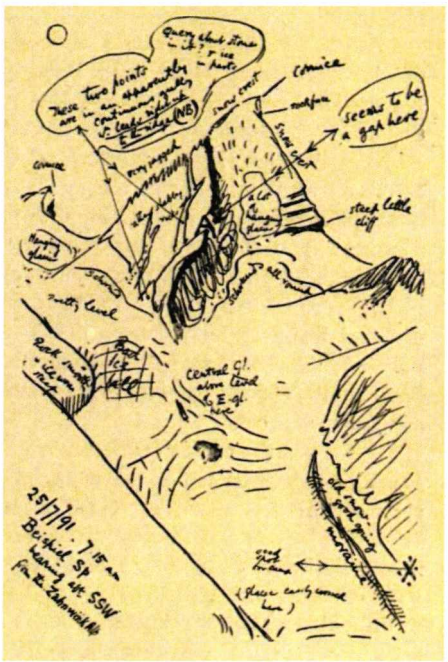
experience and observation have been sufficient to enrich them with what they would call an instinctive feeling about the meaning of topographical details which they can see, or about the probabilities of those which are out of sight.'[294]

Whilst the architects made detailed drawings of each letter or part in their 'alphabet', like we saw Serlio did in figure 23, the mountaineers instead used letters to signify the location of each topographic detail within the drawing of the whole, as in figure 24. H.G. Willink explains in the chapter on 'sketching for climbers', in Clinton Dent's book, that the

> object of such a sketch is not to create a picture, nor even to preserve a note from which a picture may be made, but simply to record bare facts of topography. [...] The end is achieved if an intelligent person, notably the sketcher himself, can, with or without the aid of a map, recognise the main features of the depicted view, when he has changed his position: and especially when he has walked into that view, and is surrounded by those features.[295]

To be able to recognise those 'facts of topography' that are recorded in the drawing when the climber is 'surrounded by those features' was, then, one the most fundamental purposes that drawings had for the discipline of mountaineering as a whole. It is thus also for this reason that the object was 'not to create a picture' – the drawing's purpose immediately being removed from the idea of the 'picture' as an aesthetic creation. A 'very poor work of art', Willink writes, 'may nevertheless record valuable information in a graphic form'.[296] During the Renaissance, however, being 'unskilled in draughtsmanship'[297] certainly did not have the same connotations as it did for the late nineteenth century climber. Their differences lay in the fact that, often, the climber's drawings were *personal* drawings that were for the use of, as Willink writes, 'notably the sketcher himself'. The sketcher had to be able to recognise and apply these topographical facts to the safe practice of his climbing. The architect's drawings, however, were intended for public instruction and use and thus they had to have an accuracy as a means of conveying spatial information, which the mountaineers did not need. As well as this, it needed to have an aesthetic appeal almost in the same way as a work of art.

[294] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 370
[295] Willink in Dent, *Mountaineering*, p. 380
[296] Willink in Dent, *Mountaineering*, p. 388
[297] Willink in Dent, *Mountaineering*, p. 388



25 Willink's tracing of the Beispielpitz, from a camera obscura, 1892

The ways in which the topographic details were recorded thus mattered very little and any means possible to record these kinds of details were then experimented with. Willink's drawing above, for example, was in actual fact created by viewing the mountain through an optical device; a small camera obscura, which was then reflected and traced onto paper, rather than sketched. Interestingly, the camera obscura, which historically had been associated with the 'acknowledged genius' of Leonardo da Vinci, and other 'masters' such as Caravaggio, Velázquez and Jan van Eyck,[298] was now used as a tool also for the unskilled climber-draughtsman:

> a small camera-obscura, by which the actual view (reduced) might be projected upon a piece of tracing-paper and then and there outlined, would be a useful addition to a mountaineering outfit.[299]

The use of an optical device to trace, rather than draw, a complex pictorial challenge such as a mountain, was something encouraged as a useful method of recording topographical outlines and details from the 'the actual view'. Susan Sontag writes about photography, for example, that it 'was welcomed as a means of easing the

[298] Sidney D. Kirkpatrick, *The revenge of Thomas Eakins* (New Haven, Conn.; London: Yale University Press, 2006), p. 165
[299] Willink in Dent, *Mountaineering*, p. 387

burden of ever accumulating information and sense impressions,'[300] and the camera obscura provided, equally, this way of 'easing' the task of recording the view for the mountaineers. However, what Willink suggested with the use of the camera obscura, an optical device that projected but did not fix the image, was the possibility for the mountaineer to interfere to a much greater extent with the image than with a photograph.

Nevertheless, Willink's campaign for the use of the camera obscura seemed almost a desperate measure to encourage the mountaineers to draw and in his chapter he makes it seem as though the practice of mountaineering depended upon these tracings, sketches and drawings. In actual fact graphical descriptions of the view using drawings were used only infrequently, and not everyone saw the same value in its use. As Clinton Dent wrote about reconnoitring, it was 'at once the most difficult and the most neglected. It is one that requires long and thoughtful experience'.[301] Thus, if, as Willink wrote, his chapter on sketching should be read 'side by side' with Dent's chapter on reconnoitring,[302] we can draw from this that it was only reconnoitring that had been neglected, but that the activity of drawing had also been abandoned as a technique, or it may have been a technique that never really was embraced, photography being the main culprit, as we will now see.

By the time Young published *Mountain Craft* in 1920, reconnoitring had popularly began to preserve the 'distant signs for future use', as he says, through the photographic image, and the camera-obscura made a distinct mark between the use of drawing and the use of photography. For example, Young only referred specifically to the use of the sketch on a single occasion in his book,[303] the camera being an easier tool for those 'unskilled in draughtsmanship', he argues. However, it is interesting that Sydney Spencer's chapter on photography in Young's book makes no mention of this function of photography as a tool to reconnoiter, whereas Dent's earlier book does:

> Photographers divide themselves naturally into two main classes; first, those who desire to secure topographical views, which may be of interest or value to other climbers, which may serve to explain routes taken, views seen, or illustrate points of physical geography; secondly, those who aim at obtaining pictorial records of the scenery [...].[304]

[300] Susan Sontag, *On Photography* (London: Penguin Books, 1979), p. 88
[301] Dent, *Mountaineering*, p. 129
[302] Willink in Dent, *Mountaineering*, p. 382
[303] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 381
[304] Dent, *Mountaineering*, p. 403

What Dent explains is that the camera may have two distinct functions for the mountaineers, first that it could provide the necessary topographical information needed by the climber, second, that it was simply a way of recording the scenery. However, both Dent and Young were aware that the majority of those who carried a camera 'confine(d) themselves to snapshot photography'[305] and aimed 'at little more than obtaining some pictures which may serve to amuse for a moment'.[306]

Both Dent and Young thus describes the inherent difficulties with representing topographic facts with a camera and since photography was still in its relatively early days, it was only experienced photographers who were able to overcome the technical challenges they faced. Nevertheless Willink writes that it cannot 'be denied that photography is more within the reach of most persons as a successful operation than painting can be said to be', but continues that 'the draughtsman must always have certain advantages over the photographer, inasmuch as his work is immediately available as soon as the sketch is finished'.[307] Willink's idea may seem strange today, in a culture which depends upon the immediacy of the digital image, but as Willink explains, the photographer in the nineteenth century would often find himself in the 'ignominious position' of finding that he lacks 'a plate, or a film, or a screw, or a cap, or some fiddling little mechanical contrivance' or that other 'vexations' such as defects, leaks and double exposures also may occur.

Graphic descriptions providing 'an alphabet' of practical information for the two disciplines had essentially one important role: that the alphabet could be recognised and interpreted correctly as instruction by others. In drawings like Willink's (figure 25) the mountaineers codes were generally to be interpreted only by themselves, and the instruction provided was generally for personal use, but this is only a general rather than absolute rule however, since the drawings provided in mountaineering guidebooks, for example, were indeed written to instruct *others*. The architects' alphabet, on the other hand, had to consistently provide instruction for others. Nevertheless, the drawings that Willink referred to above implied a more personal use of drawings than those used by architects. The problem they both faced was how a flat graphic system could communicate information about a three dimensional space and a spatial activity and the alphabet provided part of the solution.

[305] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 471
[306] Dent, *Mountaineering*, p. 403
[307] Willink in Dent, *Mountaineering*, p. 388

'A general rule at a single glance'

The capacity to communicate instructional information through 'an alphabet' of graphic descriptions was, therefore, a significant part of how the two disciplines operated. However, the idea of 'an alphabet' implied also a study of how the details were connected into a whole. Through the 'dimensions of the principal masses, and their proportions and positions with regard to each other', as Willink writes, the whole could be 'plotted'. And he continues that it 'is best to begin with the biggest, and then work by careful comparisons and measurements.'[308] These words; dimension, proportion and measurement, is something more often associated with the Renaissance architectural treatises than nineteenth century mountaineering literature, but as the words themselves suggest – a study of how the parts (the alphabet) relate to a whole, was equally significant to both disciplines. During the Renaissance the importance of knowing the correct 'proportions' of buildings and parts of buildings could be seen in every treatise published during this period. Serlio, accordingly, writes that:

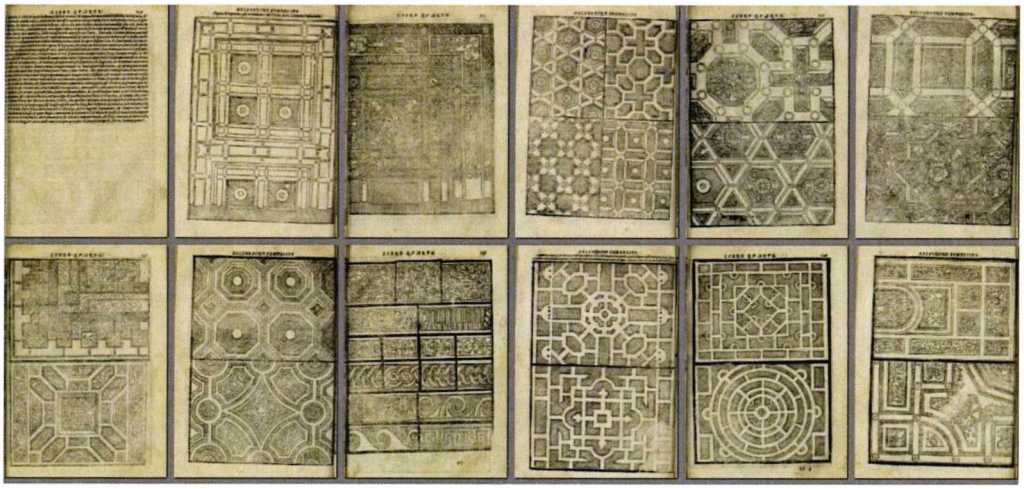
> Although only the principal proportions and measurements [...] have been marked so as to provide a general rule, nevertheless, in its place each thing shall be recorded in minute detail. This is, however (as I said), only to show *a general rule at a single glance*.[309]

Importantly, then, one of the functions of the graphic descriptions was that they should be able to provide a 'general rule' to the viewer, even when making only cursory examinations of the drawing or photograph.

In order to provide information in such a way, there is an expectation that the viewer knows 'the alphabet' discussed earlier, the alphabet providing the 'general rule'. Serlio's drawing in figure 23, for example, which as we saw earlier did not have direct references in the accompanying text and that described the meaning of the architectural details drawn, confirms the architect's statement that the drawings should provide 'a general rule at a single glance'. Both drawings, figure 23 by Serlio and figure 24 by Willink, do provide information at a 'single glance' but only if prior knowledge of the signs and their meanings had already been learned. For the most part, however, Serlio's 'alphabet' was something that was illustrated without the use of any text at all, the 'alphabet' referring simply to the 'principal proportions and

[308] Willink in Dent, *Mountaineering*, p. 383 (my emphasis)
[309] Sebastiano Serlio in Lefaivre and Tzonis, *The Emergence of Modern Architecture*, p.107 (my emphasis)

measurements' shown in the drawing. This is how Serlio's drawings throughout his *Tuttle l'opere d'architettura*, for which the majority do not have any signs or symbols, provides information about dimensions and proportions in a 'single glance'. A large proportion of his images did not even have letters or numbers, but instead Serlio left his drawings to speak for themselves entirely, as is seen clearly in figure 26 below.



26 Consecutive pages in Serlio's *Tutte l'opere d'architettura et prospetiva*, 1537.

Delorme writes that he resorts to drawing, not as something that replaces his verbal descriptions, but as something that can, like Serlio's 'single glance' explain what he with many words had attempted to explain in the text. We will see more about this in the chapter that follows, but this is one of the most important points about the use of graphic descriptions, and like Serlio, Delorme also draws this out in his treatise. Throughout his writings, Delorme subsequently writes about the immediacy with which drawings can provide spatial information simply by casting an eye, so to speak, on a drawing: 'Without further talk, this figure will show your eyes what is discussed in this chapter about modern vaults.'[310] Unlike Serlio, Delorme wrote lengthy verbal descriptions throughout the majority of his treatise, but it was clear that graphic descriptions, the 'figure' as he here says, provided Delorme with a solution to the problem he had with writing as a medium to deliver spatial information about the object. Delorme thus often writes that the reader must rely on the illustrations, or figures, where the capacity of the written word ends: 'I will show without further

[310] Delorme, *Le Premier Tome de l'Architecture*, fol. 110v/p. 253

description in the following illustration the way to prepare the cuts'.[311] Delorme's emphasis on drawing is repetitive throughout the treatise and he often ends each verbal description with: 'as you can see in the following figure without further demonstrations',[312] or that it 'is all easy to understand by means of the cut and lines shown here without discussing it further'.[313] Thus, Delorme seemed to feel more confident that drawings were better able to explain the processes of the craft than the abstract verbal descriptions.

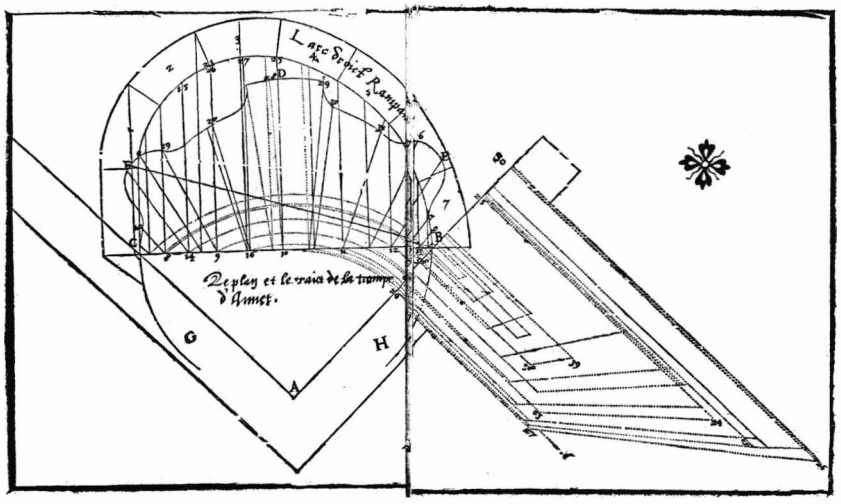
Like the majority of Serlio's drawings, which contained little or no verbal descriptions, the mountaineers towards the end of the century began to use photographs to provide the information about their space and activity, as we have seen. 'It is excellent practice', Clinton Dent writes, 'for the traveller to carry a photograph of the mountain or pass in which he is climbing, and endeavour to recognise the places in detail'.[314] The point about carrying such a photograph was in order for the mountaineer to train his ability to recognise at a 'single glance' to use Serlio's words again, the landmarks as they appeared in the photograph and the landmarks as they appeared in the mountain itself. Dent explains that the 'traveller' will find it difficult at first to recognise even the 'broad features of the scene' in a photograph, even if taken only at a slightly different point of view to where he had previously seen the same features. Dent writes that

> a mountain should be, for climbing purposes, considered first as a whole and subsequently in detail [...]

and the photograph was an important tool in this respect. However, he continues, '[i]t is not enough to identify landmarks [...] Their position and relation to other landmarks have to be grasped'.[315] Thus, in mountaineering, as in architecture, a *series* of graphic descriptions of the object was created so as to provide this information from different points of view and their relation to the plan drawing (in architecture) or the map (in mountaineering). In architecture this would ordinarily be the front elevation and section of a building in combination with the plan, and in mountaineering drawings or photographs of the mountain from different points of view together with a map.

[311] Delorme, *Le Premier Tome de l'Architecture*, fol. 63v/p. 157
[312] Delorme, *Le Premier Tome de l'Architecture*, fol. 63v/p. 157
[313] Delorme, *Le Premier Tome de l'Architecture*, fol. 70r/pp. 170-171
[314] Dent, *Mountaineering*, p. 132
[315] Dent, *Mountaineering*, p. 130

It is interesting to look at Delorme's stonecutting drawings in this respect, because his drawings were a combination of several planar views on top of each other, and thus literally provided all necessary information in a 'single glance'. His drawings represents an effort to create a system of drawings which contained all the information required in order to build an imaginary object in three dimensions, with all its geometric aspects accounted for in the drawings, but without at the same time distorting its shape. Delorme's drawing of his famous trompe at Anet is the most extraordinary in this respect.



27 Delorme's drawing of the trompe at Anet, 1567.

Delorme's drawings of cuts, such as the one seen in figure 27, consisted of a combination of the architectural plan and elevation superimposed on top of each other, with projecting lines drawn from points in the elevation onto the perpendicular line. When the projection lines from the intrados line and extrados line from each stone meets the perpendicular, you get several projection lines which, combined, creates a 'map' of marked points. If you draw a line between these marked points, you will get the template for one of the sides of the stone. To create the marked points for each side of the stone, the process is repeated on top of the same drawing and, increasingly, the drawing contains more lines and marks that cannot easily be distinguished from one another. The drawing would have become so complex that, as

Delorme says, if he was to include all the lines on his drawings, the reader would simply not be able to grasp it, too many lines upon lines would cause confusion.[316]

Thus, in order to provide information at a single glance, Willink recognised that the mountaineers had to make a selection from the information visible in an image and thus be able to translate and represent what he sees into an intelligible image. Because of this, he says, the sketcher must show

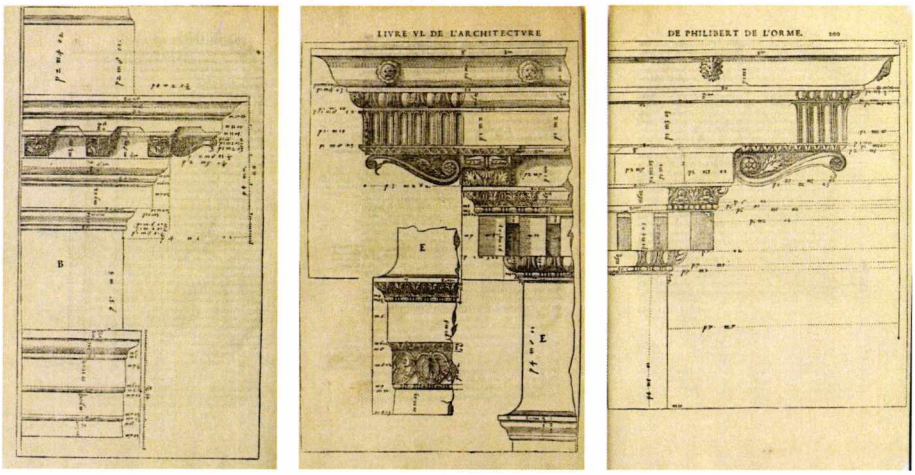
> just what is wanted and no more, and there must be no doubt, at any rate in his own mind, what it does show. Any means are admissible, the simpler the better.[317]

Nevertheless, although Delorme's drawings were very complex, we saw in chapter two that Delorme was confident that 'many gentle workers will immediately understand these cuts simply by casting their eyes upon them, and having the compass in hand will easily find the relationships [...]'.[318] In actual fact, one of the reasons that Delorme's drawings could be grasped in a single glance was because the drawings and the methods involved in the cutting and construction of the stones was for the most part based upon a certain approximation in their interpretation of the drawings. Delorme accordingly writes that

> I would advice my readers that my designs are never carried out exactly as they are shown, because stonecutters wet and sometimes boil slightly the paper on which they are drawn before gluing it onto a board. Thus as they pull this paper it stretches on one side and shrinks on the other. This is why in many cases I do not draw my figures as precisely as I have described and proportioned them here.[319]

Between the two disciplines there is one significant difference; that despite Willink's statement above and the wealth of verbal descriptions in the literature on reconnoitring, which covers the topic of measure well, few actual graphic records of the practice of 'measurement', of recording 'dimensions' and 'proportions' of the mountain actually exists in the nineteenth century literature. The importance that Willink gives it in his text would suggest that prolific material existed, however, it was in architecture in the sixteenth century that such studies were abundant in the treatises, as were they in Delorme's treatise. Some of Delorme's studies of the Corinthian order in figure 28, below, illustrate this.

[316] Delorme, *Le Premier Tome de l'Architecture*, fol. 74v/p. 181
[317] Willink in Dent, *Mountaineering*, p. 382
[318] Delorme, *Le Premier Tome de l'Architecture*, fol. 61v/p. 153
[319] Delorme, *Le Premier Tome de l'Architecture*, fol.106v/p. 244



28 Delorme measuring the Corinthian order.

Perspective and 'Mountain Architecture'

Whilst the Renaissance architects were preoccupied with measuring and drawing classical buildings, they were also at the same time engrossed in learning the art of linear perspective. The linear perspective was re-introduced during the Renaissance by Brunelleschi 'sometime between 1413 and 1425',[320] a method which was simplified and disseminated by Alberti a few years later. The second book of Serlio's treatise grapples with perspective drawings and, as John Hyman says, perspective was a 'geometrical method of depicting space' which attempted to represent the object's spatial relations in a 'non-planar way'.[321] These non-planar, or perspective representations, he writes, transformed the way in which information was communicated pictorially, and created a new consciousness around the perception of objects in space.[322] According to Hyman, the method that Alberti described in his treatise; 'a method for drawing a tiled floor in correct perspective and placing figures on it',[323] fundamentally synthesised several 'planar', or flat, methods of representing spatial relations, such as overlapping, foreshortening, diminution and shading, into a non-planar, perspectival, way. Planar methods, however, such as 'above, below, to the

[320] John Hyman, *The Objective Eye. Color, Form, and Reality in the Theory of Art.* (Chicago, Ill.; London: University of Chicago Press;, 2006), p. 211
[321] Hyman, *The Objective Eye,* p. 211
[322] Hyman, *The Objective Eye,* p. 211
[323] Hyman, *The Objective Eye,* p. 217

left of, and to the right of' something does not need the application of any special techniques in order to be represented,[324] he argues, whereas perspective drawings do.

The nineteenth century mountaineer struggled to grapple with the perspective, not only as a method of drawing the mountain, but as a way of understanding the mountain form. As Willink writes, '[i]t is generally no less difficult to appreciate the foreshortening or *perspective* of a bit of mountain than to draw it when appreciated'.[325] Young accordingly points out that '[a]llowances must always be made for the deceptive outlines that are introduced by foreshortening'[326] – but that light and shadow will help correct the eye with this problematic of understanding depth in the mountain landscape.[327] The following passage in Young's book explains that

> [f]or all such observations on snow, which find their opportunity in the relative positions of light and shadow, it is apparent that a time must be chosen when the sun shines from the right quarter. Their accuracy depends upon their being continued over a time sufficient for the sun to travel past, and so indicate to us dimension, by the change in, or the disappearance of, the shadows cast.[328]

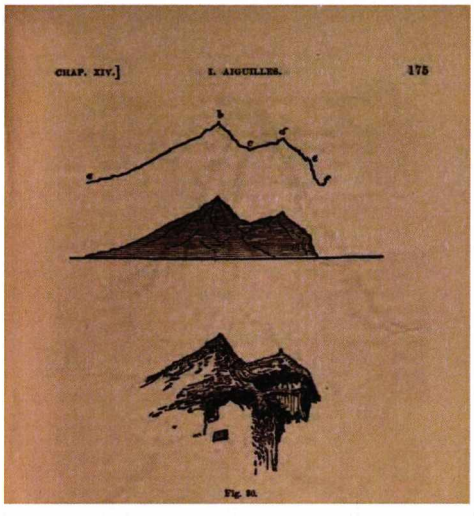
The sun, then, was their indicator of the mountain's 'dimension'. This method of indicating dimension seems to be a remnant of the Renaissance past and their study of shadows as a way of grappling with perspective. Albrecht Dürer, for example, conducted such a study in 1525, but it had already been suggested in 1390, by Biago Pelacani da Parma, that 'the knowledge of shadow projection could lead to an understanding of the figure of bodies projected onto a plane',[329] and a method of such a projection appeared with da Vinci and Dürer's studies of shadows.

The nineteenth century mountaineers thus shared these methods of observing the form of their object with many Renaissance artists, architects and mathematicians. Indeed, the mountaineers also borrowed from architecture their perspective drawings because the geometrical method of depicting space in architecture was a better way to understand and also to explain the form of the mountain to others. Willink writes that

[324] Hyman, *The Objective Eye*, p. 212
[325] Willink in Dent, *Mountaineering*, p. 385 (emphasis Willink)
[326] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 387
[327] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 387
[328] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 380
[329] Alberto Perez-Gomez and Louise Pelletier, *Architectural Representation and the Perspective Hinge* (Cambridge, Mass.; London: MIT Press, c1997), pp. 113-114

> The reader must not feel insulted by being offered the assistance of [...] a simple rough piece of architectural perspective[330]

(See figure 17). Again, Willink's method was identical to that used by Ruskin, seen in figure 29. The problem of depth perception and foreshortening was difficult to understand for the alpine tourists as well as for many inexperienced mountaineers and these 'simple rough' architectural perspective drawings helped them understand the perspective illusions of the mountain by applying the same laws of perspective to those which belonged to architecture. In the example of Ruskin's drawing below (figure 29), he uses the example of the gable roof of an old French house, as he says, 'seen under the same angle'[331] as the Matterhorn, that is, with the highest top appearing, in the perspective drawing, as the lowest point. The drawing of the house makes this perspective illusion clear in the drawing of the mountain.



29 Ruskin comparing a mountain with a building.

This, then, is a trait that the Renaissance architects as well as the late nineteenth to early twentieth century mountaineers shared – they both had a quest to rationalise space. Or more precisely, as William Ivins argues, to rationalise sight[332] and the objects within the visual field through visual representations, regardless of whether

330 Willink in Dent, *Mountaineering*, p. 387
331 Ruskin, *Modern Painters, Volume IV. Of Mountain Beauty*, p. 188
332 Ivins, William. M. *On the Rationalization of Sight, with an examination of three Renaissance texts on perspective [by] William M. Ivins, Jr. De artificiali perspectiva [by] Viator, reproducing both the 1st ed. (Toul, 1505) and the 2d ed. (Toul, 1509)* (New York, Da Capo Press, 1973)

they were planar or non-planar. In doing so it informed and improved their understanding of the object's form. Mountaineering literature had already created a deep connection to architecture through the ways in which parts of the mountain appeared to be named directly after architectural features such as 'buttress', 'chimney' and 'cornice', something that will be examined closer in the chapter that follows. It also often compared mountains with architectural styles, such as 'the Gothic character of granite and pinnacles'.[333] C.F Meade's photograph 'Mountain Architecture' in Dent's book makes this direct comparison clear.[334] It is clear that the nineteenth century mountaineers looked towards architecture for an answer in their struggle to grapple with depth and perspective illusion. To understand depth in the visual field was something that preoccupied the nineteenth century writers and mountaineers. It was difficult and required innovative ideas in order to represent it in a satisfactory way to the general public. Accordingly, artists such as Ruskin and Willink made use of drawings of buildings as a tool to explain and describe the form of the mountain by comparing the complexity of its organic form with a simpler, geometrical form, such as a building. Using architecture and drawings of buildings thus seemed to be a very successful method in describing the effects of perspective illusion to an audience that was not normally familiar with the mountain landscape.

Drawing & photographing *spatial activity*

There is one distinct difference between the graphic descriptions in Renaissance architecture and nineteenth century mountaineering, whilst in the Renaissance the object of drawing was the *building*, in mountaineering the object of drawing and photographing was more often the *human figure* within space rather than the space itself. Robin Evans writes for example that if

> anything is described by the architectural plan, it is the nature of human relationships, since the elements whose trace it records – walls, doors, windows and stairs – are employed first to divide and then selectively to re-unite inhabited space. But what is generally absent in even the most elaborately illustrated building is the way human figures will occupy it. This maybe for good reasons, but when figures do

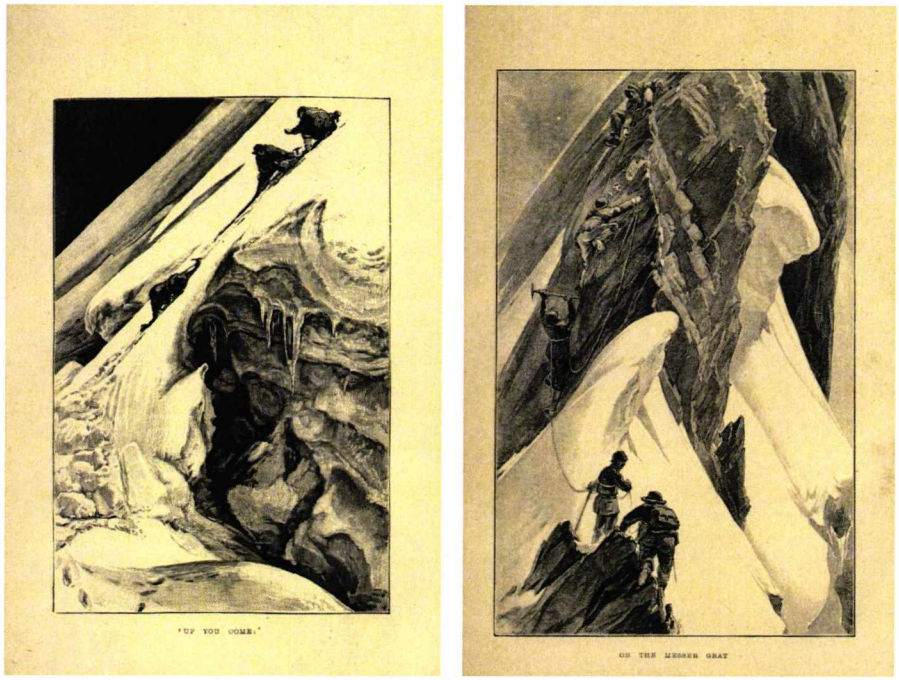
[333] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 381
[334] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 371

> appear in architectural drawings, they tend not to be substantial creatures but emblems, mere signs of life [...].[335]

During the Renaissance, this was no exception, despite the prolific interest in the human figure by painters such as Leonardo da Vinci, Raphael and Michelangelo - and 'the interplay of human figures in space [which] began to dominate painting.'[336] In the architectural drawings by Sebastiano Serlio or Philibert Delorme the human figure is completely absent. Despite the fact that both architects' treatises were the first practical treatises, neither the person as part of the process of building nor the person as an inhabitant of the buildings were visible in their drawings. This absence and thus also the implied ignorance of the human figure and human experience, is a familiar problematic in architectural theory.

In the mountaineering literature during the nineteenth century and early twentieth century, however, the human figure literally exploded onto the scene. Space and the human figure was rarely something that was not discussed or seen together in the drawings and photographs that were produced during this time. In the drawings that appear in Dent's book, the human figures are most often joined together by rope, they climb, crawl, cling, balance, fall or grip the snow or rock surface – all of which are recorded in the many drawings throughout his book. Equally important is the fact that the figures are often looking at each other or reaching for one another and there is a deep sense of a relationship between the figures *in* the space as well as a relationship that they have *with* the space itself through their physical engagement with the material. These relationships are intense, almost tangible in all of the drawings throughout Dent's book. Unlike the architectural drawings during the Renaissance, Dent's drawings were thus exceedingly informative about almost every aspect of the activity of climbing. They even illustrated cooking, eating, resting and sleeping - all fundamentally domestic activities which nevertheless were a large part of the mountaineering experience. A sense of fear, happiness and togetherness as well as other human feelings were also equally visible in the drawings.

[335] Robin Evans, *Translations from Drawing to Building and Other Essays* (London: Architectural Association, c.1997), pp. 56-57
[336] Evans, *Translations from Drawing to Building and Other Essays*, p. 57



30, **31** 'Up you come' (left), 'On the Messer Grat' (right)

In the drawing titled 'Up you come' (figure 30), the method of distributing weight correctly whilst crossing snow bridges; of crawling on 'all fours'[337], is illustrated. 'The more he extends himself', Dent writes, 'the greater the distribution of weight and the greater the safety'. [338] Nevertheless, it is 'a little startling when in this attitude to feel the hand plunge through a thin bridge into space',[339] he continues. Although the image shows that the climbers hand have pierced through the snow, his body almost flat against the bridge only with his knees half bent suggesting the crawling action required to cross, his face touching the snow, his verbal descriptions of the drawing are not at all necessary in order to describe fully the activity that is taking place. The drawing 'On the Messer Grat' (figure 31) illustrates the methods used to cross summit-ridges, which as he writes, 'are "mixed", that is to say, partly of rock and partly of snow'[340] and where no two steps are alike. Balance is important on these sharp ridges he says, because 'the axe can give no help, and there is little chance of handhold'.[341] As we see in the picture, the climber with the axe is helplessly lifting his redundant tool

[337] Dent, *Mountaineering*, p. 190
[338] Dent, *Mountaineering*, p. 190
[339] Dent, *Mountaineering*, p. 190
[340] Dent, *Mountaineering*, p. 203
[341] Dent, *Mountaineering*, p. 203

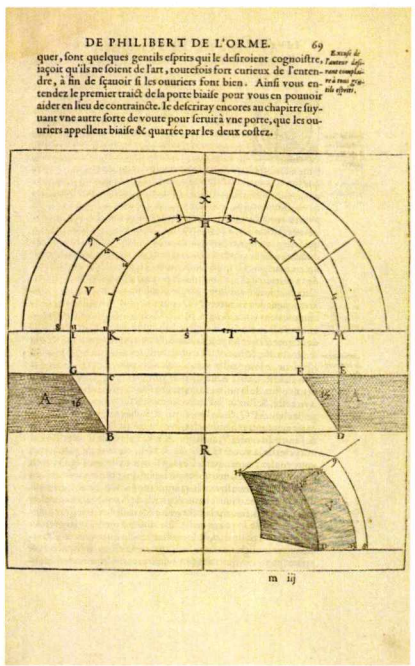
into the air, the climber above is struggling to find handholds and the lead climber, perched on a ledge above him, looks dangerously uncomfortable whilst holding another climber on the rope below him. The drawing shows the methods and movements of the body as well as the interaction between the members of the team, all of whom the rope connects. The number of these drawings in Dent's book suggests a temperament towards graphic information in the teaching of practical techniques during the late nineteenth century.

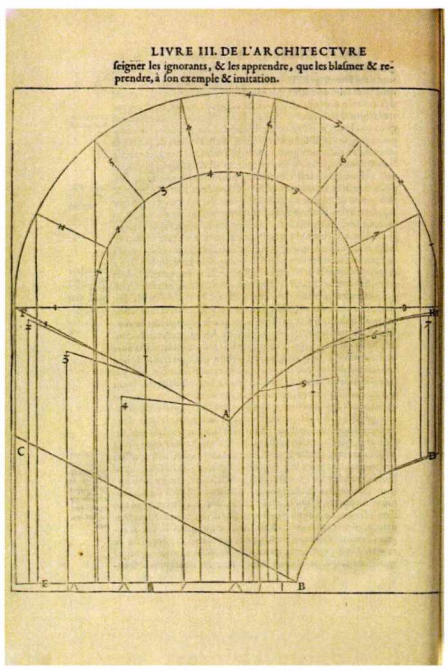
In contrast, the heavily illustrated treatise by Serlio is completely devoid of human figures, as was Delorme's, and there was no sense of how human beings were to interact within the spaces represented in their drawings, let alone how to build them. The essential elements of human interaction are present in the drawings, there are walls, doors, windows and stairs, as Evans pointed out, but without any human figures thus leaving their buildings without much evidence of life, nor of the processes of building. Nevertheless, the doors and passages within the architectural plan, as Evans argued, were 'a picture of social relationships',[342] and his discussion that followed in the essay vividly brought these to life. Much could thus be said about social interaction in the Renaissance drawings, the flow of people through doorways, corridors, passages and stairs and what this meant as evidence of social relationships during this period. However, the drawings that I am interested in here are not so much drawings as evidence only of social relationships and interaction, but with the drawings that represents the activities specific to *how to build* something, an architectural detail or an entire building. The drawings in Dent's chapter, above, successfully gave away clues as to *how to climb*, but did drawings by these Renaissance architects do the same?

Delorme, whose treatise was the first to present to a public readership the methods of drawing, cutting and constructing stones, and that focused specifically upon the work of the manual labourer, nevertheless created drawings that seemed to be even further removed from human activity than any other of the drawings frequently published in treatises during his time. Compared with the illustrations from Dent's book, nothing can seem further removed from human activity and at this point it would thus seem appropriate to suggest that mountains were more inhabited than buildings, and that the methods with which to climb them were more easily accessible through the drawings than building. Nevertheless, what Delorme's drawings show

[342] Evans, *Translations from Drawing to Building and Other Essays*, p. 62

(figures 32-33) is the process with which the drawings and templates for the cutting of the stones are made. As we saw earlier, the drawings had to be part of an alphabet whose language one must have learnt in order to understand them, but once understood they were 'in a single glance' easily accessible for the architects, masons and stonecutters. What we can draw from this is that for Delorme it was important to teach the methods of *how to draw* rather than how to build and with the current attitudes towards drawing and its role for the architect as a professional, as opposed to the amateur, this is not surprising.





32, **33** Drawing of a biased doorway (left), and doorway through an obtuse corner (right).

Nevertheless, Delorme's treatise, a manual like Dent's, do inscribe the human figure and more importantly human *actions* from within these drawings. The drawings, or traits, represent more than other architectural drawings the transactions that takes place between the person, the drawing and the building. The *process* of drawing and building is inscribed within the lines of the drawing in much the same way as action is prescribed by the drawings in Dent's book. If we look at Delorme's descriptions of the drawing of the biased doorway (figure 32), for example, this will become clearer:

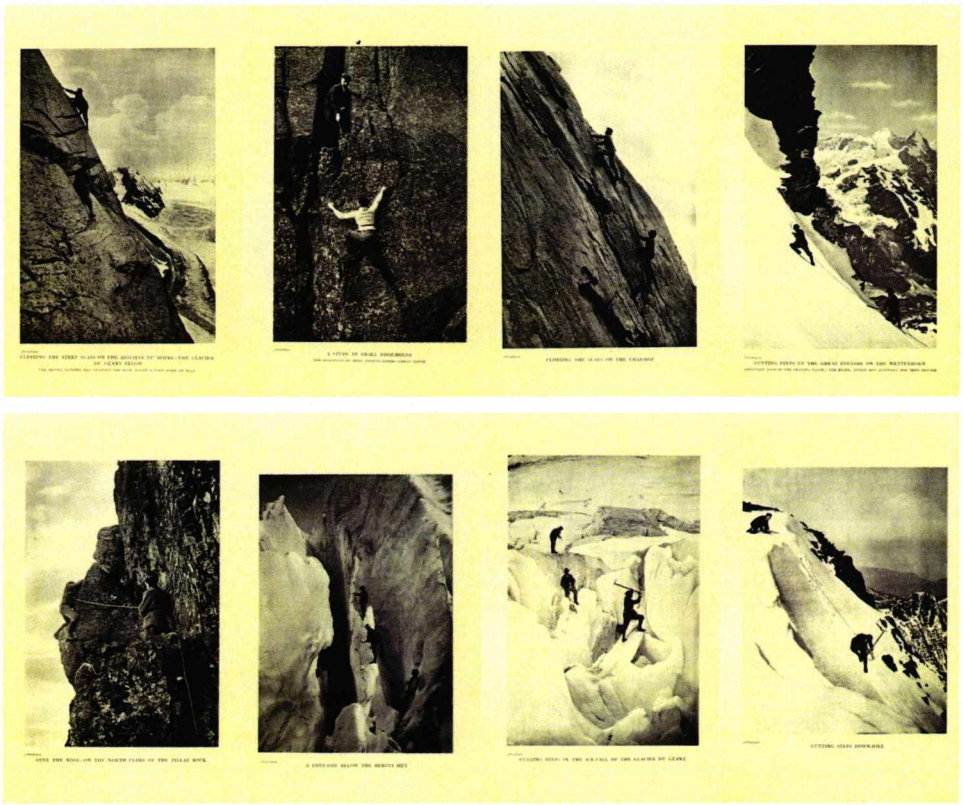
> First you will draw a straight line, such as that marked IM in the following illustration, and then again two parallel ones, GE and BD, which enclose and represent the thickness on the plan of the wall marked A, through which you intend to build the biased doorway, or the biais passe (as the workers call it). This bias is given by the two lines BG and DF which show the thickness of the wall and the bias of the doorway. [...] Afterwards you will mark on line IM two centrepoints S and T at either side of the perpendicular line, as far apart from one another as the bias of the doorway EF or GC.[343]

The person whom Delorme is addressing is being given precise instruction as to where to place each individual line and mark on the drawing, but more importantly, with each mark Delorme thus guides the draughtsman's eyes and hands from point to point in the drawing. He must 'draw' and make a 'mark',[344] Delorme writes, and further on in the text that he describes how he must 'divide', 'observe', 'place', 'find', 'take', 'transfer', 'proceed', and 'cut'[345] – all of which are evidence of deeply spatial human activities. Importantly, with those who already knew the 'alphabet' of such a craft, the verbal description would be an unnecessary addition to the drawing, allowing the drawing to stand on its own.

One of the uses of architectural drawings is to suggest approaches to a problem[346] and Delorme's drawings, like Dent's; both gave instructions for specific spatial problems and how to solve them. Along with them were sets of actions, carefully instructed, like the ones in the passage above, but it was important that the graphic descriptions were also able to stand alone and without any verbal descriptions. The discipline of mountaineering was at an important junction between depending upon drawing and sketching to taking advantage of photography's 'instantaneous' quality in order to record such spatial human activity, and the photograph provided the means by which human action could be recorded without the use of verbal descriptions. George Dixon Abraham, whom, with his brother Ashley, compiled an extensive photographic record of climbing, represents most distinctly this shift. In Abraham's book *The Complete Mountaineer*, a handbook similar to that of Dent and Young's, published in 1908, includes a large number of photographic, but no drawn, illustrations. Although the book focused entirely upon climbing in the British Isles, and was in that sense geographically restricted, it contained the most extensive graphic

[343] Delorme, *Le Premier Tome de l'Architecture*, fol. 68r/p. 167
[344] Delorme, *Le Premier Tome de l'Architecture*, fol. 68r/p. 167
[345] Delorme, *Le Premier Tome de l'Architecture*, fol. 88r-71v
[346] Edward Robbins, *Why Architects Draw; interviews with Edward Cullinan ... [et al.]*. (Cambridge, Mass.; London: MIT Press, c1994), p. 3

record of the methods of climbing, which previously only had been recorded in linguistic form. It could thus be argued that the Abraham brothers' photographic record represents what Sebastiano Serlio produced in the Renaissance: a comprehensive 'pattern-book' or a book of Orders,[347] but more importantly, that they were like Delorme's drawings, a set of images which instructed spatial activity. A collection of the Abraham brothers' photographs (figure 34), below, speaks perhaps for themselves in this respect. In the chapter that follows I will examine the ways in which verbal descriptions were used in addition to drawing, but also how they could be used on their own in a similar way to the photographs by the Abraham brothers. We will see how verbal descriptions were more often needed in graphic descriptions that attempted to describe spatial activities than space itself, although drawings like Dent's and photographs like Abraham's would suggest that the graphic descriptions at times were sufficient on their own.



34 Selected pages from Abraham's *The Complete Mountaineer*, 1908

[347] Kruft, *A History of Architectural Theory From Vitruvius to the Present*, p. 120

Conclusion

This chapter has looked at two disciplines' views on graphic descriptions such as drawings and photographs and their role in developing a sense of mastery of a craft during the emergence of the architect and mountaineer as professionals. In architecture we saw how the practice of drawing distinguished the amateur from the professional and how this approach to graphic descriptions to a large extent also applied to the mountaineers' practice. In the first part of the chapter we saw how graphic descriptions were used as a practical means by which to guide and instruct spatial comprehension through the use of essentially two different types of drawings: planar as well as non-planar.

One of the main challenges faced by both disciplines was to gain an understanding of the object's depth and how important features for the practicing of a craft could be represented and distinguishable in the graphic descriptions. An understanding of the shape and form of their object was taught through 'an alphabet of a language', something that could be seen in the majority of the drawings by both disciplines. The mountaineers, however, showed much less interest in learning this 'alphabet' than the architects, but they were fortunate in this respect because they could 'borrow' perspective drawings of buildings from architecture and transfer their use to being a tool in learning to understand the mountain's form. The most influential in this respect was Ruskin's drawings and the ways in which he made direct links between looking at buildings and mountains in his drawings, something that other artists followed. Nevertheless, drawing never achieved the same status in mountaineering as it did in architecture, and it was in actual fact very little used. Photography, however, which was an easier form of recording the mountain for the 'unskilled draughtsman' in the discipline, quickly took over this role as its extensive use from the early twentieth century showed.

One of the significant aspects of the graphic descriptions was their ability to convey spatial information quickly and 'in a single glance' but not necessarily that they represented spatial accuracy in graphic form. In order to provide 'single glance' information, however, the disciplines had to learn to translate the signs in the graphic descriptions into an understanding of the object as it appeared before them in the real world and thus also into an interpretation of the spatial activities which could follow.

4

Words and Stones

Verbal Description and Instruction as Technique

We saw in the previous chapter how graphic descriptions formed an important part of the technical repertoires of Renaissance architects including Philibert Delorme and the late nineteenth and early twentieth century mountaineers Clinton Thomas Dent and Geoffrey Winthrop Young. It provided the two disciplines with a way in which to communicate spatial information graphically, in order to learn to understand and gain a sense of mastery of the space and spatial activity of their craft. Where the last chapter examined the role of graphic descriptions as a tool to master space and spatial activity, this chapter will extend the discussion to now also include, partly how verbal descriptions were used, but also what thoughts the two disciplines had of verbal description as a tool to master their craft. This was, as we will see, a difficult and challenging task. It may have seemed more logical to start the discussion on graphic and verbal descriptions with the verbal, due to the historical dominance of the word (even if this was primarily the spoken word) before graphic descriptions appeared in architectural treatises. However, the written word and image accompany each other, and what this chapter will address is how the two disciplines used the written word in instances where graphic description failed to provide the necessary information. As such, this chapter could have formed part of the previous chapter, but in order to make the discussion clearer and to bring out the different kinds of repertoires used by the two disciplines each chapter is presented on their own.

This chapter will therefore build upon those findings that could have formed part of the discussion in the previous chapter, but were excluded so as to draw out how *verbal* methods of describing space and spatial activities were used as distinct from the graphic methods. It will focus upon the role of the written and spoken word as detached from its role as theory as seen in chapter one and instead analyse the verbal as a form of literary or narrative description; the way in which written commentary was used in order to describe and narrate space and spatial activity. The verbal descriptions used by both disciplines will be examined as a method in their bodies of techniques to gain a sense of mastery of their two spatial practices. Again, the discussion will concentrate primarily upon the three texts: the *Le Premier Tome de l'Architecture, Mountaineering* and *Mountain Craft*, although in architecture other texts, including some more modern interpretations of the use of verbal descriptions of architectural schemes will also be looked at.

The 'practical value' of verbal description

In architecture, it is useful to begin with Vitruvius because during Vitruvius' time images could not be easily reproduced and the original version of his ten books (or scrolls) of architecture was consequently very little illustrated, and limited to in fact only ten basic geometrical diagrams.[348] The diagrams functioned as a basic visual aid, in the same way as we saw graphic descriptions being used in the previous chapter. However, because of his refusal to illustrate his treatise, his shortcomings, Mario Carpo writes, is 'less on his literary ineptitude than on the inherent difficulty of translating from the visual to the verbal.'[349] As seen in chapter one, this literary practice was a reversal of an architecture that learnt from experience on the building site, to now learn through studying the rules of the discipline through discourse and writing.[350] Nevertheless, as Carpo points out, 'the communication of complex visual data could not take place via visual means. For the most part, such data had to be translated into verbal discourse, primarily the written word.'[351] Consequently, Vitruvius' text has remained a mystery until today, and although in the centuries that followed attempts were made to add the 'missing' illustrations, it is not known for

[348] Carpo, *Architecture in the Age of Printing*, pp. 7-17
[349] Carpo, *Architecture in the Age of Printing*, p. 18
[350] Carpo, *Architecture in the Age of Printing*, p. 18
[351] Carpo, *Architecture in the Age of Printing*, p. 21

certain whether Vitruvius purposefully left his treatise on architecture as a visual mystery and without illustrations, or whether there were practical reasons for their exclusions in the text. Carpo suggests that practicalities such as the accurate reproduction of images had been the reasons for excluding them.

In the previous chapter it was shown how graphic descriptions, at times, were able to stand alone and able to represent space and spatial activity without the need to use verbal descriptions to fulfil their assigned role. (See figures 30, 31 and 33) However, and as will now become clear, verbal descriptions often had to be used in order to fully describe the space or activity that it referred to. The two disciplines' views towards verbal descriptions were then partly based upon a dependency on language, something which undoubtedly also influenced their views on language or verbal description as a tool. In order to begin the discussion, it seems appropriate to first refer to architectural historian Adrian Forty who famously asked in his book *Words and Buildings*: 'What can language do that drawing, the architect's other principal medium, does not?'[352] In architecture in antiquity and the Middle Ages, he continues, 'drawings played little or no part in the production of buildings'[353] and as we saw in the previous chapter it was not until the Renaissance and especially from Filarete and onwards that drawings took on the central role in architecture that we know today. If not drawing, then architects historically had to rely on language, but it is not language in the absence of drawings that is addressed here. Rather, the ways in which language, and more specifically written rather than oral language, was used at two distinct times in history when drawings were also commonly used. What, then, did these verbal descriptions do that the graphic descriptions did not? What was their practical value?

Clinton Dent, for example, who as we have seen was one of the first to write an instructional manual on mountaineering, wrote in the Badminton Library's book on mountaineering that

> the amateur, who can make some use of map and compass, who is able *to deduce information of practical value from the writings of others*, and who will take the trouble to use his reasoning powers as much on the mountain-side as in the ordinary affairs of life, is capable of forming judgements which will prove of signal value [...].[354]

[352] Forty, *Words and Buildings*, p. 29
[353] Forty, *Words and Buildings*, p. 29
[354] Dent, *Mountaineering*, p. 134 [my emphasis]

These were three main factors that Dent believed was important to the climbers; the ability to make use of 'map and compass', 'writing' and 'reasoning powers', and the three were not entirely unconnected. The first referring to graphic representations of the mountain, the second to verbal descriptions which often accompanied the first, and the third to the ability to make sense of the first two. It is perhaps not surprising that Dent would have had this opinion on the 'practical value' of writing, himself having written a book that was to change the history of mountaineering by being able to provide comprehensive guidance and instruction to budding mountaineers for the first time through the written word.

Like Dent, Delorme needed words in order to 'deduce information of practical value' but, more precisely, Delorme needed words in order to describe what his complex drawings through graphic means attempted, but failed, to describe. More importantly, his verbal descriptions were used in order to instruct the activities represented in the drawings. The verbal and the graphic in Delorme's work were thus inter-connected. James Ackermann, as discussed in chapter one, argued that architects during the Renaissance avoided the written word[355] and we saw that Geoffrey Scott claimed that the architects of this period instead concentrated mainly on 'taste'.[356] Ackermann accordingly concluded that the treatises that were published as a result were 'visual' types of compendia.[357] However, Renaissance architects did need words and their treatises, despite Ackermann's claim, were written for the practical instruction of architects in a variety of topics.

Architects both before and during Delorme's time used verbal descriptions, but what Ackermann meant was that the words they used were not words in the sense of a written theory. Rather, the words they used described buildings, the types of buildings and the orders, but more importantly, that these descriptions were of the ancient buildings and the architectural orders, rather than in any way presenting new theories of building. Francesco Colonna's *Hypnerotomachia Poliphili*, for example, which was written a century before Delorme, contained 'numerous lengthy, detailed, enthusiastic and erudite descriptions of architecture'.[358] However, there was a significant change in the role of verbal descriptions between the time Colonna and Delorme wrote their texts. Verbal descriptions during this century developed from

[355] Ackerman, *Distance Points*, p. 378
[356] Scott, *The Architecture of Humanism*, p. 40
[357] Ackerman, *Distance Points*, p. 363
[358] Lefaivre and Tzonis, *The Emergence of Modern Architecture*, p. 77

describing predominantly visual features of a building to describing *how* a building was constructed and thus also the activities involved in these processes. Arguably, this progress in verbal description as instruction reached its peak and culminated in the publication of Delorme's books three and four on stonecutting in his treatise. Accordingly, Delorme's treatise stands as a marker in the history of the instruction manual, his two books representing the most detailed type of instruction in stonecutting from this period. His verbal descriptions providing precise step-by-step instructions on how to create the drawings and templates used in the cutting of stones. It therefore seems important to look more closely at what Dent, Young and Delorme thought about the 'practical value' of verbal description in order to understand better the kinds of processes that took place in both disciplines between verbal description and learning.

It is important to first establish the context with which Dent wrote that an amateur could 'deduce information of practical value from the writings of others'. The mountains he referred to were located in 'unknown districts', he says, hence the information available to the amateur mountaineer should provide as much spatial information as possible. In Dent's view, a 'map', 'writings' and 'reasoning' would be able to supply much of what was necessary in this context, his text also making it clear that these three elements were employed *instead of* a mountain guide. As he says, mountain guides 'depends more on his memory than his judgement',[359] something which according to Dent was not the safest way to climb in these districts. However, because Dent so clearly refers to *three* elements in this context, we can also draw from this that a map and the ability to reason were not adequate on their own. The 'writings of others' would therefore form a large proportion of the sources he thought the climber should obtain his information from. What this also implied was that Dent must have felt as if maps or other graphic descriptions alone did not hold enough information about the space in order to safely climb mountains in these unknown districts. Maps and other climbers' verbal descriptions were thus the only two sources of information about these places and what is implicit in Dent's text, as he writes further on, was that those who could 'deduce' information from writings that had a practical value would as a result be able to 'excel' in the sport.

[359] Dent, *Mountaineering*, p. 134

Famously, Colonna's text was one of the first illustrated architecture books,[360] and there were a total of 174 woodcuts in the text, something which was extraordinary during this time. However, Colonna's text - a romantic allegory - was not instructional in the sense that the architectural treatises were. Alberti's *On Building*, for example, dealt with matters of a practical nature – such as 'construction', 'town and fortification planning', 'new building types, economy in buildings, ornamentation, model making, as well as the social status and inner workings of the architectural profession'.[361] Despite the seemingly practical nature of his treatise, the instructions in the form of verbal descriptions would require the reader to form abstract knowledge of the ideas presented. Alberti writes for example that

> In my opinion, one very good way of building a strong wall, capable of withstanding the shock of the engines, is this: make triangular projections out from the naked wall, with one angle facing the enemy, at the distance of every ten cubits, and turn arches from one projection to the other; then fill the vacancies between them with straw and earth, well rammed down together.[362]

Although treatises such as Alberti's contained concrete instruction through these verbal descriptions, they did require of the reader an ability to form concrete three-dimensional ideas from abstract and non-dimensional descriptions.

As Clinton Dent observed, there was a strong connection between the mountaineer's knowledge gained from reading and his ability to make reasoned judgements from these abstract descriptions. These descriptions formed the majority of the information about the space and spatial activity in the texts, and so the ability to transfer abstract knowledge into practice was essential. However, Dent does at the same time make it clear that there was a strong dividing line between the amateur mountaineer and the mountain guide, and that their differences indeed lay in their ability to reason. A mountaineer, as he said, would take 'the trouble' to use his 'reasoning powers', whereas the guide would rely on his memory. With his use of the word 'reason', Dent draws a direct line between the necessity to think in a logical and rational manner - and to the mountaineer as someone who had these capabilities. We saw this also in chapter one, where there was a clear association between the newly formed written theories of the craft of mountaineering and the idea that a craftsman was someone who had intellectual as well as practical capabilities.

[360] Lefaivre and Tzonis, *The Emergence of Modern Architecture*, p. 77
[361] Lefaivre and Tzonis, *The Emergence of Modern Architecture*, p. 53
[362] Lefaivre and Tzonis, *The Emergence of Modern Architecture*, p. 59

It seems that what Dent really meant when he used the word 'reason' in this context, was an ability to visualise three-dimensional space from the abstract verbal description. For example, if in mountaineering the place was 'unknown' it would be natural to assume that the 'writings' Dent referred to were able to describe the space in such a way that it would give the two-dimensional graphic description a more realistic and three-dimensional life. In addition the verbal descriptions in combination with the graphic descriptions should be able to provide sufficient information in order to climb the 'unknown' mountain. Dent writes for example that choosing the best line of ascent easily could be 'checked by [...] reference to written descriptions'[363] whereas with graphic representations Dent writes that the mountaineer 'will find it difficult to recognise principal landmarks from a photograph'.[364] To illustrate, Dent uses the example of a photograph of the Matterhorn without, however, ever showing this photograph. Rather, he describes it verbally:

> Take, for instance, a photograph of the Matterhorn as seen from the Riffel. The great white streak like a high-road, shown in the photograph to run right across the eastern face, will not be readily recognised by a man on the peak. Yet it looks a strongly marked guide.[365]

The fact that the photograph that Dent describes is entirely fictional and thus not shown in the text emphasises the role that verbal descriptions had over graphic descriptions for mountaineers around this time. The photograph that Dent refers to is excluded because what he is discussing is something that is difficult, if not impossible, to describe through graphic means. The difference being in the way that verbal description was able to bring the third dimension to an otherwise non-dimensional abstract description. This is why the mountaineer should take advantage of the fact that often, as Dent writes, every step of an expedition is 'minutely laid down in descriptions of previous ascents'.[366] In Dent's view this is important because if the climber was to rely solely upon the landmarks seen in such a photograph, the expedition would undoubtedly be compromised by those 'Unseen', and thus unexpected, parts of the mountain. What is clear, then, is that the mountaineer *needs* language and verbal description because it in many ways is able to provide more precise and specific descriptions than graphic descriptions.

[363] Dent, *Mountaineering*, p. 132
[364] Dent, *Mountaineering*, p. 132
[365] Dent, *Mountaineering*, p. 132
[366] Dent, *Mountaineering*, p. 130

In order to verbally describe a mountain, however, one must have also practiced ones observational skills of the mountain. Dent therefore argues that mountaineering is 'beyond all other sports, one that it is imperative to take up, to a certain extent, seriously' and it is the mountaineer's duty 'to acquire all the proficiency he can develop'.[367] To acquire this 'proficiency', the mountaineer must study the mountain both as a whole and in detail, he argues, and that these details would be found in the practicing of reconnoitring. His concern in the text, however, is that the practice of reconnoitring had become a thing 'of the past'.[368] The guides, he continues, already knows almost all such information, or it is known by the detailed verbal descriptions of previous ascents of the same mountain. This is often the case with mountains in the Alps, he says, implying that the Alps was a place that was well known by most people either through personal experience or through reading about the experience of others. What Dent is arguing, then, is that although verbal descriptions were an important source of information, it must not serve as the primary, or only, source. Despite his strong belief in verbal description as a tool, Dent thus draws out that verbal descriptions are second to gaining knowledge through direct observation.

Dent's use of the term 'amateur' for a person taking advantage of the minutely laid down verbal descriptions of climbing routes, emphasises that to draw conclusions about practical information from descriptive writing was imperative for those training to become professional mountaineers, and that it was for such an audience that his book was written. An amateur, not yet practiced in the skills of reconnoitring – or the surveying - of the mountain, would probably first gain information from his reading, before attempting to climb the mountain. The difficulty with verbal descriptions, as Dent expressed, was that the guidebooks that described the mountains in such a detailed way could end up being the amateur's only source of information. The difference thus lies in whether to rely upon *reading* or *observing*, or both. The two depending essentially on two different skills; the first, the ability to translate abstract information into a three-dimensional knowledge of the object, and the second, of being able to understand different aspects of the object's three dimensions as it is presented to them in the real world. If the mountaineer's abandoned reconnoitring over knowledge grained from reading, it could then be argued that the mountaineers struggled more with interpreting the real than the described.

[367] Dent, *Mountaineering*, p. 130
[368] Dent, *Mountaineering*, p. 130

Almost 30 years after Dent's writing, Geoffrey Winthrop Young also wrote in his book that during

> the last twenty-five years the standard of difficulty that can be accomplished with ease and safety by a rock climber of ability has gone up by some 25 per cent. To this rapid advance the literature published on the subject has contributed. [...] The novice, or the expert in a district new to him, *guided by his reading*, can economize his nerve and muscle for the more difficult passages [...].[369]

In this passage Young attributes indeed the increase in the climber's safety as well as his technical abilities on the rock directly to the literature that he has been reading, and that has guided him. As he says, this increase is measurable and has 'gone up by some 25 per cent'. Young's statement is intriguing, not only for directly owing these measurable improvements in climbing to the literature, but also because he suggests that the evidence is measurable in accurate percentages. It seems clear that the texts that Young was referring to were both theoretical and narrative and both types of literature, then, had an important influence upon the mountaineers' learning. Theory, we saw in chapter one, played a large part in how the two disciplines progressed due to the way in which their techniques were now systematised into rules and principles.

Young clearly emphasised the benefits of reading, and of learning principles from books, he writes for example that the 'good amateur'

> has, or ought to have the superiority of the educated mind over the uneducated, of the liberal intelligence over the narrow, of contact with men, of reading, of the chance of learning principle and precedent from books.[370]

Not only did he stress reading as a valuable tool, but he also draws a link between reading and imitating. The climber, he continues, 'has also the advantage of being able to make up rapidly, by means of reading, imitation'.[371] That reading here is compared with imitation is an interesting way to explain what describing is. By reading a description, then, one imitates in one's mind the space or the activity that the author describes. Thus, if as both authors suggested, the writing of others had the power to create talented mountaineers then we must first ask what, more specifically, was the kind of writing that Dent and Young were referring to, and how could it have such an impact?

[369] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 138-139
[370] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 108
[371] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 108

Describing space and spatial activity

We saw earlier that Ackermann called some treatises of the Renaissance 'visual' types of compendia but that they also used verbal descriptions for the practical instruction of all matters architectural. Filarete, for example, instructs the reader (verbally) about 'the architect-patron relationship, the organisation of the construction process, beauty and style in buildings, prison designs and city planning.'[372]

This organisation of information in the treatises was common during the Renaissance, and Delorme's treatise delivered information in this familiar manner, with his book one and two focusing upon the general conditions of building - such as the choice of site, its orientation and choice of materials - as well as the status of the architect. Books III and IV, as we have seen, contained explanations of the tools used by the stonemasons and gave detailed instructions for the methods of drawing the stones to be cut, the text gradually works its way through the building methodically and in stages, commencing with the building's foundations, then doorways for cellars and onto constructions such as vaults, squinches (or trompes) and staircases. Book five-seven deals with the Tuscan, Doric, Ionic and the Corinthian order as well as the new French order, whereas books eight-nine examined types of openings such as doors, windows and fireplaces.

In comparison, Young's book was divided into nineteen chapters, with chapter one instructed the mountaineer in management and leadership skills, chapter two explained the equipment which was needed in the Alps, chapter three focused upon the relationship between guide and apprentice, chapters four to nine dealt with specific instruction in techniques such as rock climbing, climbing in combination, corrective climbing, ice and snow craft, reconnoitring and mountaineering on ski. Chapter ten contained a short explanation of the uses of mountain photography whereas chapters eleven until nineteen described different types of rocks and climbing such as those in tropical countries, in the Arctic (Spitsbergen), Caucasus, Corsica, Himalaya, Norway, New Zealand, Pyrenees and the Rocky Mountains.

In this way, the information in Delorme and Young's texts share the same organisational principles; with each author considering, for example, the practitioners position – or to borrow Young's chapter title again; their 'management and leadership' skills – as one of the first topics (Young: chapter one and Delorme: book

[372] Lefaivre and Tzonis, *The Emergence of Modern Architecture*, p. 67

two). The subject of the craftsman's tools is discussed in Young's chapter two, which mirrors Delorme's descriptions in book three. Where Young's chapters four-seven and nine looked at different styles or methods of climbing, these books reflect most of the content of Delorme's books three and four, which grapple in detail with different types and methods of cuts. Young's chapters eleven-nineteen, which deal with mountaineering in different regions and examine their different types as well as giving a general impression of the topography, brings Delorme's books five-nine, which examines the architectural orders and gives a review of their different stylistic types, together. In this way, the information provided in the Renaissance treatises were organised along the same principles as the nineteenth century mountaineering manuals.

The early Renaissance treatises such as the ones by Alberti, Filarete and also Delorme's contemporary Serlio, had in common that their texts were primarily dominated by an attempt to describe *space*; the building or decorative objects associated with the building. This is where Delorme's treatise differed from other treatises written during the Renaissance because his books three and four instead provided much detailed instruction of an *activity*. This is what Delorme and the mountaineers shared, because although much of what was verbally described in the mountaineering books were used to describe the space of the mountain, their descriptions also of spatial activities was something that had a much stronger presence in these books than in the earlier architectural treatises. Accordingly, the mountaineering manuals effectively combined both types of descriptions: of both space and activity. Verbal descriptions of *space*, mountains or buildings, was often used in combination with the drawings or photographs, hence the reference to visual compendia, whereas verbal descriptions of the *activity* in combination with graphic descriptions – at least in architecture – was much less used. Nevertheless, what is certain is that graphic descriptions depended on verbal descriptions both in order to provide a fuller picture of the space as well as the activity.

The interdependent relationship between the verbal and the graphic was especially evident in Clinton Dent's book and an example of such writing is best shown in the sketch seen in Dent's chapter on sketching which we saw in the previous chapter (figure 25). By looking at the text in this drawing, we see handwritten notes such as: 'seems to be a gap here', 'these two points are in an apparently continuous gully [undecipherable] to the ridge (NB)', 'snow crest', 'cornice', 'very jagged', 'pretty level',

'old snow - good going', 'bad ice fall', 'steep little cliff', 'query about stones in it? [undecipherable] ice in parts?', 'rock smooth and [undecipherable] ice'.[373] The drawing where this text appears is also dated and timed, '7.15am' – suggesting first that the author was aware of how the varying qualities of light may influence his observations and second that he perhaps would make several such drawings at other times of the day and thus also with a different verbal description. This type of text functions primarily as a way in which to describe what Young calls the 'Unseen', that is, those aspects of the mountain that are not visible from the distance or from particular perspective views.

We saw earlier that Dent was concerned that the mountaineer would not be able 'to recognise principal landmarks from a photograph'.[374] The words above, used in combination with any graphic description, was a kind of signpost to guide the climbers and thus be able to provide the necessary spatial information. By making a personal drawing, such as the one seen in figure 25, the climber has to make a decision about which signs to describe and that would best represent the form of the mountain and what signs to describe with written words. As the example above shows, there is in fact a lot of text on the small drawing that Dent used as an example in his book, leaving us with the suspicion that, in fact, the drawing could not itself stand alone in representing the space without the accompanying text. The descriptive text written on top of the drawings attempts to depict those 'Unseen' aspects of the landscape and in this way, the written notes in a way adds the third dimension to the two-dimensional sketch. The notes representing that information which would only otherwise become visible by moving through the space of the mountain, by spending time on it and seeing it from varying points of view. This kind of information would be things such as the material qualities of snow, rock and ice, such as whether it is 'old snow' or 'smooth', what angle the surface has, whether it is 'jagged', 'steep' or 'level', - all of which are not otherwise easily understood or possible to record in the graphic descriptions.

In comparison, in Delorme's treatise, which as we saw in the previous chapters was a manual like Dent's, his verbal descriptions were more about inscribing human action into the drawing than about describing the space itself. His text, which accompanied the drawings, or traits, verbally described in a very precise way the ways

[373] Dent, *Mountaineering*, p. 387
[374] Dent, *Mountaineering*, p. 132

in which the transactions took place between the person and the act of drawing. His verbal descriptions presented the *process* of drawing to the amateur and although the lines that are inscribed within the drawing represent these actions, an amateur cannot understand them without also being able to read the text. In order to make this clearer, it is useful to quote here again from Delorme's description of the drawing of a biased doorway (figure 32), as seen in the previous chapter:

> First you will draw a straight line, such as that marked IM in the following illustration, and then again two parallel ones, GE and BD, which enclose and represent the thickness on the plan of the wall marked A, through which you intend to build the biased doorway, or the biais passe (as the workers call it). This bias is given by the two lines BG and DF which show the thickness of the wall and the bias of the doorway. [...] Afterwards you will mark on line IM two centrepoints S and T at either side of the perpendicular line, as far apart from one another as the bias of the doorway EF or GC.[375]

Delorme's precise instructions gives detailed information about where to place each line and each mark on the drawing, but more importantly, with each word Delorme is able to guide the draughtsman's eyes and hands between points in the text to points in the drawing. He uses active verbs such as 'draw' and 'mark',[376] and further on in the text how he must 'divide', 'observe', 'place', 'find', 'take', 'transfer', 'proceed', and 'cut'.[377] All of these words are evidence of deeply spatial human activities which otherwise are not visible in the drawing itself. However those who already knew their 'alphabet' of the craft of stonecutting would find these verbal descriptions to be an unnecessary addition to the drawing.

In examples such as these, then, when verbal descriptions directly accompanied the graphic, Young and Dent used short sentences; often single words, describing *space* whereas Delorme used long descriptions of the *activity*. At other times, Young and Dent naturally used longer verbal descriptions in order to instruct the activity of climbing, and not just space, as was shown in chapter two where they described in detail some of the climber's movements. That the earlier Renaissance treatises excluded activity in this way is indicative of the fact that architects from at least Filarete's time until the present day have very successfully used and valued architectural drawings such as plans, sections and elevations. These drawings were used in order to represent both the seen and unseen aspects of built space, whereas the

[375] Delorme, *Le Premier Tome de l'Architecture*, fol. 68r/p. 167
[376] Delorme, *Le Premier Tome de l'Architecture*, fol. 68r/p. 167
[377] Delorme, *Le Premier Tome de l'Architecture*, fol. 71v-88r/p. 173-207

mountaineers however, did not have the same opportunity to represent the shape of the mountains in this way. Consequently, and as was shown earlier, Young refers constantly to the problematic of the 'Unseen' aspects of the mountain. In a way, then, the two texts draw out some of the problems with space and spatial activity that the two disciplines struggled with independently of each other, but their independent struggles were also the source of the two disciplines borrowing techniques and methods of solving spatial problems from each other, in mountaineering we see the use of architectural drawings, for example, as a way of describing the shape of the mountain in a better and more comprehensible way.

This scrounging, as it were, between disciplines also happened with words, not just images, and the mountaineering literature used words that had decidedly architectural origins. These are words such as 'buttress', 'pinnacle' 'chimney', 'cornice', 'wall' and 'roof', which have been used as words that also apply to the shape of mountains. Words such as 'pinnacle', for example, appear around 1330 in the *Oxford English Dictionary* as a term which refer to 'An architectural construction surmounting a building; *spec.* a small ornamental turret, usually terminating in a pyramid or cone, crowning a buttress, roof, or coping.'[378] However, the term as it refers to mountains appeared at precisely the same time, also around 1330. The pinnacle in this respect meaning; 'A natural feature forming a peak; *esp.* a mountain peak; a pointed or projecting rock or outcrop.'[379] When terms such as 'pinnacle' started appearing in the literature, it probably did not have as distinct a separation in the way we use these terms today, rather it may have been the case that these words were referring instead to a more general way of describing space which as a result was applied to both built and natural spaces.

Whilst 'pinnacle' crossed disciplinary boundaries, the nineteenth century mountaineering literature regularly referred to other, more categorically architectural terms. One that repeatedly occurs, as Young describes below, is what they describe as a 'gothic' character of the mountain:

> Ice upon rock is apparent, either as a grey-blue, bottle-glass bordering to the stippling and nestling of old snow, or in the refrozen festoons of

[378] See sentry for 'pinnacle, n.', §1a, in *Oxford English Dictionary Online* <http://dictionary.oed.com> [accessed 26 September 2012]
[379] See sentry for 'pinnacle, n.', §2, in *Oxford English Dictionary Online* <http://dictionary.oed.com> [accessed 26 September 2012]

> new ice, exquisite and evil, that complete the Gothic character of granite and pinnacles'.[380]

Using architectural styles to describe mountains repeats itself throughout most of the literature during both the nineteenth and twentieth century. 'Buttress', for example, was a term that appeared in the two disciplines with several centuries between them. Buttress as an architectural term is referred to as 'A structure of wood, stone, or brick built against a wall or building to strengthen or support it.'[381] The word is first recorded as an architectural term in 1392, whereas its connection with the mountain space appears only about three centuries later, in 1682. Then, the term was defined as; 'A projecting portion of a hill or mountain *looking like the buttress of a building.*'[382]

The fact that the definition itself specifies its similarity to a building, is indicative of the phenomena which repeats itself throughout the nineteenth and twentieth century mountaineering literature – and that mountaineering, in a way, *needed* architectural terminology in order to verbally describe mountains. That terms such as 'gothic' was used so prolifically in the mountaineering literature in the period spanning the authors examined in this thesis have origin in the Gothic Revival which flourished in Britain between 1830 and 1900.[383] Certainly, the use of the term 'pinnacle' was an offshoot from this gothic craze. The term 'cornice', a term from classical architecture, aptly appears as an architectural term in 1563, but as a term referring to the mountain space is only seen as late as in 1871 - and the *OED* here quotes the mountaineer John Tyndall in this first entry of the word. As an architectural term it is defined as 'A horizontal moulded projection which crowns or finishes a building or some part of a building; *spec.* the uppermost member of the entablature or an order surmounting the frieze.'[384] As a term that refers to mountains, it is defined as 'An overhanging accumulation of ice and wind-blown snow at the edge of a ridge or cliff-face.'[385]

[380] Young, *Mountain Craft.* Charles Scribner's & Sons, p. 381
[381] See sentry for 'buttress, n.', §1a, in *Oxford English Dictionary Online* <http://dictionary.oed.com> [accessed 26 September 2012]
[382] See sentry for 'buttress, n.', §3, in *Oxford English Dictionary Online* <http://dictionary.oed.com> [accessed 26 September 2012]
[383] See for example Michael J. Lewis, *The Gothic Revival* (London: Thames & Hudson, c2002) and Chris Brooks, *The Gothic Revival* (London: Phaidon, 1999)
[384] See sentry for 'cornice, n.', §1a, in *Oxford English Dictionary Online* <http://dictionary.oed.com> [accessed 26 September 2012]
[385] See sentry for 'cornice, n.', §3b, in *Oxford English Dictionary Online* <http://dictionary.oed.com> [accessed 26 September 2012]

In architecture, terms such as 'roof' have entries dating as far back as medieval times, whereas the term having a specific meaning as a mountaineering term appeared only in 1963.[386] The term 'wall', however, although it has the longest of entries in the dictionary, does not have a separate paragraph for the term as it relates to mountaineering, despite authors like Clinton Dent who in his vocabulary at the end of his book has the entry: 'Wall: A term used to denote a steep face leading up to a ridge.'[387] Instead, the *OED* refers to a 'wall' in this instance as having a 'transferred' use as: 'Something that resembles a wall in appearance; a perpendicular surface forming an enclosure or barrier.'[388] The difference between terms such as 'buttress' and 'cornice', and terms like 'roof' and 'wall' is that the first set require in both disciplines either prior knowledge, an 'alphabet', of the terms, whereas the second does not. The use of the latter two terms are examples of terms that are used prolifically throughout contemporary mountaineering literature, and their reference to built architecture has deep meanings, something which we will se more about in the last chapter, on aesthetics, in this thesis.

Both the structure of the two disciplines' texts as well as the terminologies used in these texts was, then, transferable between them – drawing a strong connection between architecture and mountaineering as well as between the methods that formed their repertoire of techniques.

The difficulties with verbal description

Verbal description as instruction did not, however, provide an all-encompassing solution to the problem with describing space and spatial activity. As much as the two disciplines under no doubt relied heavily upon language there was simultaneously an awareness by both disciplines that language could only get one step closer to giving the reader a truthful idea of these spaces and activities, but that it would never be able to fully represent it. This frustration is tangible throughout both texts. Delorme, for example, often expressed very directly that his own writing was not able to provide all

[386] See sentry for 'roof, n.', in *Oxford English Dictionary Online* <http://dictionary.oed.com> [accessed 26 September 2012]
[387] Dent, *Mountaineering*, p. 416
[388] See sentry for 'roof, n.' §II 8a, in *Oxford English Dictionary Online* <http://dictionary.oed.com> [accessed 26 September 2012]

the information about the methods that were vital in order understand how to draw and cut the stones:

> For as much as one may have the knowledge to construct all the templates, there is needed a different understanding to know how to apply them and trace the stones to have them cut. The methods cannot be readily shown, and *cannot be understood from writings* if one does not see them in effect and in practice.[389]

What Delorme here refers to, and which he fears is not possible to be explained through verbal means, is the way in which the templates are applied to the stones. His Books III and IV, therefore, which grapples with detailed instructions on how to draw, does not make any attempt to verbally describe the process of applying the two-dimensional drawing to the three-dimensional object. Rather, he makes repeated statements, such as the ones above, about how the knowledge one needs in order to apply and trace the templates is a 'different' kind of knowledge than that which is needed in order to draw the cut itself.

Accordingly, the 'method' that Delorme says 'cannot be understood from writing' suggests that verbally describing the *activity* of building was something far more difficult than describing the *space* or the building itself. This was especially the case when describing how something changes from two to three dimensions, as in the case of the templates which first exists in the complex drawings, for then to be transposed from the drawing onto the stone. Interestingly, Delorme instructs the activity of drawing in detail throughout Books III and IV but argues that instructing the activity of tracing the templates onto the stone 'to have them cut' was something that could only be shown 'in practice'. It could be argued that there was a difference between two kinds of activities in his treatise, then, and that only one these were verbally described: the activity of drawing and the activity of building. However, the practice of stonecutting here leaves a distinct question: which of the two did he describe? Is the tracing of the templates onto the stones a part of the practice of drawing or is it one of building? In many ways it could be said that it is a practice that rests firmly somewhere in between the two, being both an act of drawing and an act of building. As the tracing of the templates onto the stones is one of the most crucial aspects of stonecutting it is probably more correct to say that it belongs to the practice of building, something which emphasises the argument that he described drawing and not building.

[389] Delorme, *Le Premier Tome de l'Architecture*, fol. 78v/p. 188 [my emphasis]

Delorme's familiarity with drawing, and with verbally describing its methods, can be linked with the mountaineer's ability to describe the activity of climbing – since in the two disciplines, drawing was for Delorme what climbing was for Dent. That Delorme was less encouraging about the use of verbal descriptions than the mountaineers was not surprising because during Delorme's time, as we saw in the previous chapter, the 'new genus of architects'[390] was an idea attached to their command of drawing, not building. For this reason, along with his view that stonecutting could truly only be taught through practical experience, Delorme used his writing to verbally describe the physical actions and processes necessary in order to draw the stones. To trace the stones in order to cut them however, as Delorme writes above, one needs a different sort of understanding about the object than what can be 'understood from writings'. Delorme thus understood very well that any attempt to describe either graphically or verbally the ways in which to apply drawing onto stone by tracing the templates onto the stones was an impossible task, and he refers regularly to the need to see it 'in effect and in practice', that is, the need to observe the practice of transferring the templates onto the stones first hand in order to understand. Verbal descriptions did also have many useful functions, as we have seen earlier, but the problematic relationship between the representation and its subject matter prevails throughout both literatures.

Delorme's first problem of 'a different' understanding is also the clue to the second problem with verbal descriptions. As Delorme expressed it:

> Be it as it may, the practice of this cut will be shown to you below as well as I can. However, this will not appear as self-evident as I wish, since its invention is very subtle and many Geometric cuts are required which are easier to show in practice than to explain and excogitate back to their reasons.[391]

That the reader would have to 'excogitate back to their reasons' implied that the reader would have to develop an idea of the object in thought, in other words that he would have to translate abstract language to form an idea of the object. This, as Delorme implies in the passage below, was difficult: Although Delorme is primarily describing the ability to visualise, or imagine, three-dimensional forms in the mind, he was also at the same time alluding to the ability to reason and the problems that this may have. If 'practice' is the opposite of 'reason' it may thus be proposed here that

[390] Forty, *Words and Buildings*, p. 30
[391] Delorme, *Le Premier Tome de l'Architecture*, fol. 87v/p. 206

what Delorme meant was that 'practice' in actual fact was something more intuitive than something that is resolved through rational thought. Young, however, had a different view on the way reading and the imagination is effectively collaborating to form 'a trained mind', or as he said, 'the application of imagination and a trained mind'.[392] In order to solve the problems, imagination and reasoning powers are important, he said.[393] Young emphasised the importance of the powers of the mind in this respect, and argued that the imagination was a significant part of being successful.

The modernist architect Adolf Loos famously said that he 'had no need to draw [his] designs. Good architecture, how something is to be built, can be written. One can write the Parthenon.'[394] In the modern era, the idea that one could write architecture was tried and tested by several architectural firms, examples of which we have in the Morphosis's CDLT house (1989) as well as the Italian group Archizoom's scheme in the 1960's which was presented entirely as a verbal description:

> Listen, I really think it's going to be something quite extraordinary. Very spacious, bright, really well arranged, with no hidden corners, you know. There will be fine lighting, really brilliant, that will clearly show up all those disordered objects. [....] My God, how can I describe to you the wonderful colours! You see many things are quite hard to describe, especially because they'll be used in such a new way [...].[395]

However, in the scheme itself Archizoom writes that it is 'hard to describe' the space, something which in actual fact confirms Delorme's fear that words are not precise enough to describe three-dimensional space. As Forty explains, Archizoom's description, which contained no information about particulars, 'no mention of what the space was for [...] and nothing about its physical delineation', received as many varieties of the project as there were people reading the words. Such experiments were not unique, Forty writes, William Alsop's project called 'The Other Room' was a project in words, and Jean Nouvel's Diploma project was entirely written.[396] Archizoom's experiment, although its intention was to receive as many different proposals as possible, shows that the chief difficulty with verbal descriptions was their need for precision in order to convey their intended meaning.

[392] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 108
[393] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 108
[394] Adolf Loos, 'Regarding Economy' (1924), trans. F.R. Jones, in M. Risselada (ed.), *Raumplan versus Plan Libre*, (New York: Rizzoli, 1988), p. 139
[395] Quoted in Forty, *Words and Buildings*, p. 34
[396] Forty, *Words and Buildings*, p. 35

'Verbal projections of architecture' were not uncommon in the Middle Ages Forty explains, in fact, they were more common than drawings, and this must have presumed 'an unusual degree of trust in the builder'.[397] Later, with Delorme's verbal descriptions, however, the builder or the stonemason is set in a different kind of position to the one Forty explained. Here, although previously claiming that his books three and four were instructions to stoneworkers, master masons as well as for the architect, the precise descriptions of how stonecutting was to be executed in actual fact removed the previous degree of trust and instead gave the architect more power to control masons, workers and builders. Delorme's drawings together with the accompanying text could instruct anyone of how the processes of stonecutting were to be executed. Unlike the CDLT house where 'the project must be treated as an experiment with an unknown outcome'[398] all stages of production in Delorme's text must be followed precisely as he described it – or at least this was his intention. His texts were, like a mountaineer's guidebook, an as exact as possible a description of the way to carry out an activity. However, as Delorme writes,

> the matter is very difficult to practice and execute, which is why it can hardly be taught by books and writings. Thus I may be excused if in all these discussions I have not been able to explain it all well and to make it understood as I wish and desire.[399]

Teaching stonecutting through writing, then, was only something Delorme did with difficulty and his justifications for not being able to 'explain it all well' and to 'make it understood' in the way that he wanted it to be understood, are only some of many excuses that appear throughout his treatise.

Although both Dent and Young seemed confident in verbal descriptions as a way to convey the methods and rules of climbing, there is evidence of an underlying understanding throughout both disciplines texts that 'books and periodicals' cannot be as effective a way of learning as direct advice and 'imitation'. Young writes for example that the

> presence in the hills of an increasing number of men who climb well and confidently has had even more effect than the publication of books and periodicals. Directed by advice, and by what is still more effective, by imitation, the beginner is no longer in danger of getting into habits of false positions and of false judgment, whether of the

[397] Forty, *Words and Buildings*, p. 35
[398] Forty, *Words and Buildings*, p. 35
[399] Delorme, *Le Premier Tome de l'Architecture*, fol. 87v/pp. 206-7

> angles or of the character of rock holds. He grows up in an atmosphere where these matters are common knowledge, and he learns almost unconsciously.[400]

Being directed by 'imitation' is in this context seen as something that meant adopting the methods used by other climbers whilst engaging in the activity of climbing, although as we saw earlier, 'imitation' was a term that Young earlier connected to *reading*: 'He [the good amateur] has also the advantage of being able to make up rapidly, *by means of reading*, imitation'.[401] 'Imitation' is thus simultaneously associated with a way of learning through the application of abstract concepts such as those learned whilst 'reading' as with those learned by the realistic and haptic experience that is associated with direct 'advice'. Although Young here clearly associated reading with both of these methods of learning, direct as well as abstract, the passage above does nevertheless suggest that Young may not have had as much confidence in imitation through 'reading' as he had through direct 'advice'.

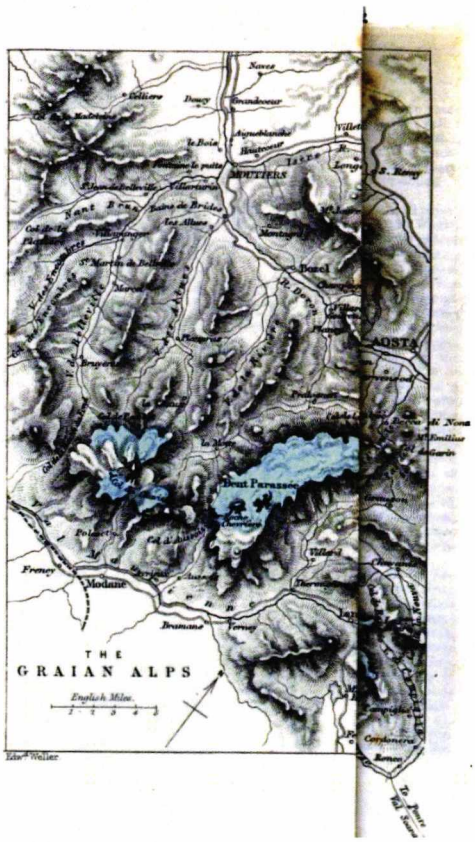
Much later in the book, Young also writes of the 'considerable loss' that mountaineering had suffered due to the production and use of 'maps and guidebooks',[402] which as he says 'relieve the mountaineer of almost all occasion to apply his powers of observation'. Here, what Young refers to is the kinds of verbal descriptions that describe the space itself rather than the activity. If guidebooks 'relieve' the mountaineer of his observational skills what he is suggesting is that being provided with verbal descriptions about a space stops the mountaineer from being able to draw conclusions from observations seen with his own eyes. In the guidebooks by John Ball, for example, we see an example of the kind of descriptions Young was referring to:

> Over the gap which marks the upper end of the gorge the snowy peaks of the Levanna are seen, and the path ascends more steeply by rude steps, in some places cut in the live rock – whence the passage is called *Scalare de Ceresole* – till at the summit it emerges abruptly into the undulating, almost level, upper stage of the valley, divided into barley-fields and rich meadows, enclosed by pine forest, and above these by rugged peaks [...].[403]

The text refers to route 'E' in the Graian Alps, the northern segment of the Western Alps along the French-Italian border, between 'Ponte to Tignes, by the Col de Galése'.

[400] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 139
[401] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 108 [my emphasis]
[402] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 370
[403] John Ball, *A Guide to the Western Alps* (London: Longmans, Green, and Co., 1866), p. 165

The text describes topographical facts such as that the gorge is 'snowy', the path is 'steep', the steps are 'rude', that 'the summit emerges abruptly', whereas the upper valley is 'almost level'. '[B]arley fields', 'meadows' and 'pine forest' as well as 'rugged peaks' are singled out as topographical landmarks. What Young was alluding to was the importance of practicing the skills of reconnoitring instead of relying on already existing interpretations. This is particularly important in the mountains where the landscape is always changing and the gorge, which in the description above is 'snowy' may not be covered in snow at a different time of the year.



35 Map of the Graian Alps by Edward Weller, 1866

Rich descriptions of buildings are especially well known through the writings Francesco Colonna, who as we saw earlier, wrote 'numerous lengthy, detailed, enthusiastic and erudite descriptions of architecture'.[404] Colonna writes for example in *Hypnerotomachia Poliphili*, the first ever descriptions of a swimming pool:

> There I gazed in wonder at a marvellous octagonal bath-house. At every single external angle there was a pair of twinned pillars. Set

[404] Lefaivre and Tzonis, *The Emergence of Modern Architecture,* p. 77

> below them, and rising from the level of the area, were pedestals or areobates, joined together all round. Then followed the pilasters, standing out from the wall by a third of their breadth, with capitals placed beneath a straight beam, and above it a frieze beneath a cornice, going completely around.[405]

Although this text has been generally attributed to Colonna, as Lefaivre and Tzonis writes; 'it was probably written by Leon Battista Alberti'.[406] The description of the buildings are equivalent to those that Ball made of the mountains, although verbal descriptions of buildings did of course not have any of the same issues related to topographic details that in the mountains depended on seasonal changes. The architectural text, unlike the mountaineering text, was rich in architecture-specific terminology – something that made the text less approachable to readers without this prior knowledge. In total, the short paragraph contains eight such terms: 'pillars', 'pedestals', 'areobates', 'pilasters', 'capitals', 'beam', 'frieze' and 'cornice', whereas the climbing text contains only three such terms: 'gorge', 'peak' and 'summit', all of which did not need much prior knowledge by the reader.

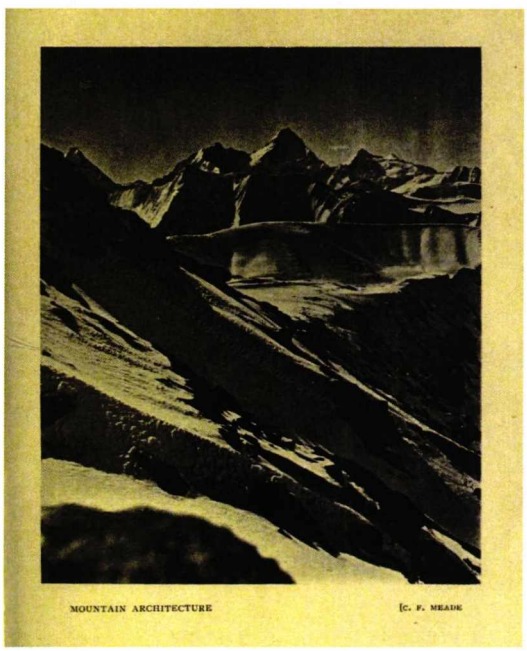
When Young argued above that verbal descriptions of mountains such as those of Ball's relieved 'the mountaineer of almost all occasion to apply his powers of observation',[407] it is as though he was afraid that verbal descriptions would bring to an end the practice of reconnoitring and learning to see. It could also be argued that the opposite may well have been the case, that these verbal descriptions in actual fact taught the mountaineer how to see, however, this was not something Young mentioned in his text, nor did Dent. What we can draw from this is that the mountaineers in the late nineteenth to early twentieth century had strong concerns with the role of the observer and anything that could interfere with this was seen as a potential threat. Both verbal and graphic descriptions could therefore pose as a threat to their attempt to establish a sense of trust in the 'techniques of the observer', to use Jonathan Crary's famous words.[408] It is clear that the mountaineers had a complex relationship to verbal descriptions, but it is difficult to draw any firm conclusion about whether *observing* was more important than *reading* in their repertoire of techniques to master a craft. Instead, I would suggest that both had equally important roles in their quest to master the difficult craft of climbing.

[405] Lefaivre and Tzonis, *The Emergence of Modern Architecture*, p. 77
[406] Lefaivre and Tzonis, *The Emergence of Modern Architecture*, p. 77
[407] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 370
[408] Jonathan Crary, *The Techniques of the Observer. On Vision and Modernity in the Nineteenth Century* (Cambridge, Mass.; London: MIT Press, c1990)

However, there was one important difference between the two disciplines, Delorme's interest in verbal description was more in the form of instructions about how to perform a spatial activity rather than description as a way to learn to see space. We saw this especially in chapter two how the prolific literature that was published during the mid nineteenth century only developed instructional literature towards the turn of the century. The problem with describing space (as opposed to activity), Young explains, lies in the difficulty with describing the 'signs' that are within view:

> We may write of a "snow sky" and an "ice sky", and a mountaineer who had them pointed out to him would recognize the difference; but we cannot with truth say "a snow sky is a whitish-blue, or shows a white underside on a cloud," or "an ice sky is greyish-blue, and reflects in a shade of grey from a cloud,"[...]. But who would learn to recognize the differences, under continually changing conditions of light, from his recollections of a written classification?'[409]

Therein lies the difficulty also with Ball's descriptions and Young's critique of those, like Ball, who wrote guidebooks from about the mid nineteenth century. '[S]igns' in practice, Young argues, 'are so modified by place, climate and season that no rules could be laid down without a page of exceptions to prove each one'.[410]



36 Photograph showing some of the 'signs', by C. F. Meade

[409] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 371
[410] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 371

If a 'page of exceptions' was necessary in order to lay down some 'written classifications', then this was also the case with those 'signs' that were visible in photographs. As we saw Dent write earlier, the mountaineer would 'find it difficult to recognise principal landmarks from a photograph'.[411] Young, being well aware of the limitations in verbal (as well as graphic) descriptions thus proposes that

> One day of practical demonstration under guidance will reveal more of what we ought to see and how to see it than much tabulation.[412]

Yet he compares reconnoitring with grammar by using the phrase 'the grammar of reconnoitring',[413] almost as though the practical study of the landscape could be compared with the structure of a sentence. In the late nineteenth and early twentieth century the term 'grammar' was known as referring to the fundamental principles or rules of an art and often appeared in titles of books,[414] but its use in this context disappeared during the early to mid part of the twentieth century. The term nevertheless suggests a relationship between a craft and a language, both of which consists of rules for their practice. The function of the letters in the alphabet and the reference to 'an alphabet of a language', which we saw earlier, also affirms this view.

The strongest criticism Young gives to verbal descriptions comes in his chapter on 'ice craft' where he writes that

> Theory can only help save him from certain false positions. A word from a mentor on the spot will save aching shoulders and blistered hands, and be of far more use than many books. Book-lore has rather hindered than helped us by some of the theory it has set down.[415]

Young's 'word from a mentor', which here refers to the orally spoken word, rather than the written, indicates the medieval craftsman's approach to learning which Delorme's stoneworkers would have relied on at a time when verbal instructions were more common than either drawing or writing. The word that Young is here referring to is thus a language that belongs to practical rather than to theoretical language. Thus, 'Book-lore' and 'the theory it has set down' is something Young here sees as an obstruction to learning. Although he writes in the chapter on 'mountaineering by ski'

[411] Dent, *Mountaineering*, p. 132
[412] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 371
[413] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 373
[414] See sentry for 'grammar, n.', §6a-b, in Oxford English Dictionary Online <http://dictionary.oed.com> [accessed 03 October 2012]
[415] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 294

that more 'can be learned from books than the reader might imagine',[416] and that verbal instruction 'will save aching shoulders and blistered hands'. The spoken word is of course also based upon theory, but it is a theory that always relies upon the practical implementation of its rules, something that Young clearly considers advantageous.

There is, then, a difference between the written word and the spoken word and what Delorme seems to be saying is that 'written things', as well as not providing the same pleasure as first hand experiences, it does not provide the same kind of 'instruction' – something both Young and Delorme agrees upon. The practice of mountaineering and the practice of architecture, despite their many centuries of distance apart, seemed to have an underlying understanding that knowledge could not effectively be 'instructed' through verbal descriptions. Delorme writes in this context that he

> would add that extracting the fruition and profit out of written things does not provide the delectation, pleasure and instruction that can be had from things practiced and shown first hand [...].[417]

It does, perhaps, not come as a surprise that Delorme would write such a thing and that 'written things', in his opinion, would only be a weak substitute for the pleasure that 'first hand' experience provides. As both disciplines were fundamentally based around the practical implementation of rules in order to perform essentially practical tasks, these problems with description is a recurring problem for both disciplines. Hence, we see in the nineteenth century climbing books a tendency towards a similarly divided opinion in whether, and to what extent, verbal descriptions on climbing have influenced the technical development of climbing and therefore also the level of difficulty that a climber could achieve whilst still remaining safe on the mountain.

In fact, Delorme's treatise was filled with suspicions about both verbal and graphic descriptions. 'I believe', he writes, 'that few would profit from the simple and naïve demonstrations I could make of them'.[418] Other times, we find that Delorme finds it difficult to explain either in words or in drawings how an activity is to be executed, because he does not have the necessary technical knowledge about how particular problems can be represented and thus described. We therefore see in Book IV a particularly interesting passage in this respect where he states that 'it is difficult to explain it better other than by practice, showing the hand and eye how the stones are

[416] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 404
[417] Delorme, *Le Premier Tome de l'Architecture*, fol. 87v/p. 206
[418] Delorme, *Le Premier Tome de l'Architecture*, fol. 61v/p. 153

to be traced and assembled.'[419] He continues that he 'would willingly describe many of these here' but that their 'excogitation and presentation [was] like assembling a great puzzle [...].'[420] Later architects proved indeed that it was possible to describe these geometric problems, but as Delorme writes: [t]o tell the truth, I scarcely know what else to say, other than to show how it is to be constructed in practice, which is here impossible.[421]

Conclusion

In this chapter we have seen what views the two disciplines had upon verbal descriptions and also how they were used in combination with, and without, graphic descriptions. It was shown that both disciplines to a great extent relied upon the verbal although their dependency upon language also was the source of much criticism throughout the texts. On the one hand Clinton Dent distinguished verbal from graphic descriptions in their ability to provide instruction and guidance to amateurs who previously only could have learned from practical experience. Geoffrey Young agreed that it was owing to the literature that an increase in the climber's technical abilities improved. Generally, they established that they needed verbal descriptions in order to create a more realistic and three-dimensional impression than what the graphic descriptions were able to provide.

However, these two authors as well as Philibert Delorme heavily criticised the way that the descriptive methods failed in being able to provide the necessary information required to perform a task, and they resorted instead to expressing the need to 'show in practice' what a space was like, or how a spatial activity was done. As a consequence, they all agreed that neither graphic nor verbal descriptions could replace practical experience and this is referred to repeatedly throughout the texts. They all understood that the means they had at hand, verbal and graphic descriptions, were not able to provide all the information they needed in order to explain neither the space nor the activity. Finally, we saw that the problems with verbal descriptions crossed many historical boundaries, but that it was one that persisted to be a problem across many centuries and different spatial disciplines.

[419] Delorme, *Le Premier Tome de l'Architecture*, fol. 108r/p. 247
[420] Delorme, *Le Premier Tome de l'Architecture*, fol. 61v/p. 153
[421] Delorme, *Le Premier Tome de l'Architecture*, fol. 107v/p. 246

5

Lines of Thought

Technical Repertoires of Visual and Other Spaces

In the last four chapters the role of theory, practice, graphic and verbal description in the two disciplines' spatial practice was examined. The current chapter will build on some of the concerns indicated in chapter two and three, and examine different types of cognitive processes and what roles they fulfilled in the quest to master a craft and became part of the repertoire of techniques for architects and mountaineers. It will be concerned with cognitive processes such as those modes of actions that take place in memory and in the imagination, but also the less easily understood mode of intuition. It will examine the ways in which cognitive processes are employed in acquiring and enhancing their skills and the ways in which information is absorbed, processed and retained. More specifically it examines the evidence within the texts of the use of several cognitive processes, but without making a distinct difference between them, because although they are separate from each other, in the original texts they are presented as indistinct from each other, as a whole. It is beyond the scope of this chapter to give an entire systematic account of these cognitive processes beyond what the authors themselves wrote, however, this chapter will gather the evidence within the texts of a recognition by the writers that cognitive processes were an essential part of the ways in which they built and climbed, and because neither professions systematically reflected upon its role, this chapter will assemble those sections which in the original texts only appeared as parts and thus be able to examine in more detail that which is explicit in the texts in order to understand their implicit meanings.

The underlying concern in this chapter, as with this project as a whole, is with the ways in which the practitioners of architecture and mountaineering use a number of techniques as a way of enhancing their knowledge of the object as well as the spatial activity that dominates their disciplines and thus achieve a sense of mastery of their craft. The idea that the disciplines used visual and 'other' spaces, or mind-spaces, as one of these techniques, forms the fifth in the repertoires of the two disciplines. The enquiry is built around trying to understand the capacity that some of these practitioners have, to figuring out through such processes in the mind highly complex three-dimensional configurations without the need for other sources of imagery. This is a necessary and additional part of the role of 'the practical' as discussed in chapter two. The unyielding substance of stone that in one discipline is used as a material to build and in another as a material to climb is here challenged by the flexible quality of the mind that both disciplines use in order to contest its counterpart.

Again, one part will examine architecture in the sixteenth century, especially through Philibert Delorme's *Le Premier Tome de l'Architecture* and the evidence in Books III and IV on stonecutting of a transaction that takes place between the processes of cognition, drawing and building. The other part will examine the transactions that occur between the activities of the mind and the activity of climbing in the late nineteenth and early twentieth century through Clinton Dent's *Mountaineering* and Geoffrey Young's *Mountain Craft* as well as examples from our contemporary time.

From drawings to 'spiritual labour'

Whilst the two disciplines were emerging into what we know today as the modern architect and mountaineer, proper terminology and conceptual frameworks developed and we saw how theory, practice, graphic and verbal descriptions all formed part of such a framework. The role of cognition and representations of the mind, however, brings to this thesis something which neither discipline attempted to frame in any way through theory, although it is clear that it had a major role within their work. Although the historical research into these two disciplines reveal that its role was fundamentally practical, an understanding of their background in contemporary debates during each respective period must also be brought into the discussion in order to appreciate not only how it was used, but to provide a snapshot of what it might have meant to their current mindsets.

The painter Henry George Willink argued in Dent's publication *Mountaineering* in 1892 that 'the end is achieved if [...] *with or without* the aid of a map' the mountaineer would be able to 'recognise the essential features of the depicted view, when he has changed his position; and especially when he has walked right into that view, and is surrounded by those features'.[422] Although Willink's chapter on 'Sketching for climbers' attempted to convince the reader of the necessity of learning to draw, what this also implied was that the sketch, which 'begins where that of a map leaves off', also should become redundant and that no form of graphic representations would be needed at all. Geoffrey Young accordingly argued in his book *Mountain Craft* that the mountaineer had to 'learn to see and to record all day and every day, not only distant signs for future use, but each and every detail of his surroundings. The detail may be forgotten, but its accumulation will gradually form in his mind a mass of general precedents and of knowledge of the characteristics of particular shapes and structures. This will remain with him, and will return instinctively to aid his judgement when some cognate detail presents itself to be interpreted as a piece of solitary evidence.'[423]

Such an act of 'recording', an act of memorising 'details of his surroundings' in the mind, meant as a consequence that any record of these topographic details 'may be forgotten'. Nevertheless, as Clinton Dent wrote, a

> note-book and pencil may be of assistance, but it is often better to rely on your memory, which is a book that can be kept open in the worst weather, leaving both hands free for climbing.[424]

Although representations such as drawings and photographs provided the instrument that made it possible to record, and as a result learn, knowledge gained from recording evidence in a graphic form, and thus having to carry them, was not particularly sensible, nor very practical. It was therefore necessary, Dent proposed above, to be able to identify topographic details, as well as remember them, without the need to carry graphic representations. A 'book' of this nature, the book of memory as it were, would leave 'both hands free for climbing' and indeed, could 'be kept open in the worst weather'. Dent's proposition of the role of memory, although very important as a practical technique, was not elaborated upon nor explained in any more detail than what has already been shown.

[422] Willink in Dent, *Mountaineering*, p. 381 [my emphasis]
[423] Young, *Mountain Craft*, Charles Scribner's & Sons, pp. 395-396
[424] Dent, *Mountaineering*, p. 311

Chapter three of this thesis examined the role of drawings and photographs, but what had to be excluded from the discussion was the link that connects the ways in which the climbers used drawings and other graphic descriptions in order to train their cognitive abilities. In other words, how they would be able to memorise topographic details in the mind alone and as a result not depend upon drawings at all. In order to grapple with concepts that belong to the faculty of the mind, it thus seems appropriate to first make this exchange that takes place between the two kinds of representational techniques, the ones that exist graphically and the ones that exist cognitively.

Contemporary climber Ben Heason explains that when he first became serious about climbing and attempted harder climbs, he would use different methods of graphically recording the climbs in order to help him remember the hand and foot-moves for his next attempt on a climb. Having returned home after a climb he would then:

> attempt to recreate the climb, in as much detail as I could with a picture diagram, detailing every single hand and foot hold (and gear placements where necessary), and number each hold in the order of the sequence I used them in. Next time I went back to the climb I would assess how accurate my 'memory' of the climb had been. I would repeat this several times, or until I had the route 'wired' in my mind.[425]

As Heason writes, his drawings were used predominantly in order to learn to remember - it was a method that, in effect, trained the mind to remember entire sequences of hand and foot moves of particular climbs. Picture diagrams containing detailed information such as 'every single hand and foot hold' as well as 'gear placements where necessary' became a distinct method to 'assess' the accuracy of his memory, and this process would be repeated until the route was 'wired' in his mind. That the memory would be accurate and the information perceived as being reasonably permanent is indicated in his expression that it was 'wired in [the] mind'. Heason continues that as his climbing improved, his ability to remember the route would improve and as a consequence the need to use drawings, or even words, declined: 'I found that I could remember sequences and specific gear placements much better so the need to actually draw diagrams or write words as reminders became less important.'[426] The ability to memorise routes thus improved in parallel to the climber's skills, gradually making the drawings redundant.

[425] Email correspondence with Ben Heason, 30th June 2008, p. 255
[426] Email correspondence with Ben Heason, 30th June 2008, p. 255

Neil Gresham also uses drawings in order to help him remember climbing moves, and he explains that 'I draw topo plans of the route, with all handholds, footholds, rests and clips marked + also relevant prompts for each move. This tends to be for hard redpoints[427] (e.g. 8b and above). They serve the purpose of helping to engrain all aspects of the sequence.'[428] Gresham thus draws a direct link between the use of drawing and its function in helping, as he says, 'to engrain' the sequence of the climb. Both Heason and Gresham's terms for memorising: being 'wired' or 'engrain[ed]' in the mind both indicate something quite physical, something that has a material reality and a permanent presence – unlike the matter of memory itself. The first, being 'wired' insinuates something that has a mesh-like but yet three-dimensional structure, whereas being 'engrained' purports to the form and shape of something that is physically impressed in somebody's mind.

Scottish climber Dave MacLeod however claims that he does not use drawings at all: 'I just remember the moves in my head', he writes, 'but I play moves back in my head so often I don't even realize I'm doing it.' [429] A lot of his time is spent thinking consciously about each move he has to make, he says, but this thinking also continues in the 'background'. Interestingly, he writes that the

> only thing I've ever drawn out was the gear placements on a winter route called 'The Hurting'. I could remember the moves no problem, but seemed to have problems remembering which piece of gear went where. [...] I'm thinking about doing the same on the route I'm trying now on Ben Nevis. It's easier for me to remember maybe 300 or more foot moves than 14 gear placements in the right order.[430]

This statement is very significant because the fact that MacLeod is having trouble remembering the gear placements, but not his hand or foot moves, emphasises the implications that tactile experience has on the ability to remember. The gear was in some way experienced as a separate entity to the bodily movements and was as a consequence much harder to remember. Nevertheless, drawings were clearly seen as an important part of the process and especially for difficult climbs such as redpoints. It is not clear whether it is the process of drawing the lines on paper or the result of the visual image itself that helps this 'engrainment' of the sequence, but it is possible to assume that the physical act of drawing the lines created this feeling as a result of a

[427] A 'redpoint' refers to climbs that are free-climbed, (i.e. where no equipment is allowed except a rope which is used only in the event that the climber falls) after having practiced on the route beforehand.
[428] Email correspondence with Neil Gresham, 8th August 2008, see appendix, p. 256
[429] Email correspondence with Dave MacLeod, 28th June 2008, see appendix, p. 257
[430] Email correspondence with Dave MacLeod, 28th June 2008, see appendix, p. 257

combination of the act of moving the hand to *draw*, and with *looking* at the object. In effect, this is what the nineteenth century mountaineer's called 'learning to see'. This both haptic and visual experience of the climb had an added benefit of providing the entire climb in the 'single glance'.

Not everyone, however, found a benefit in using drawings, as MacLeod's example above proves, but it does seem as if for the majority of climbers this independence from drawings seems to be inherently related to the level of experience a climber has, and that the more experienced he is the less likely he is to need the drawings. Neil Gresham writes accordingly:

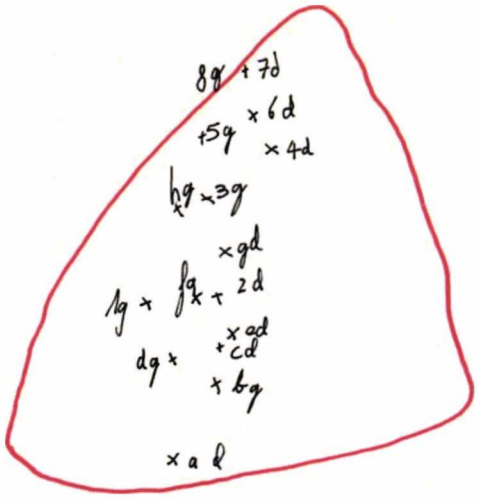
> I know for sure that the ability to remember moves comes with practice. Some of the most intelligent people who I coach [...] can't remember more than 2 moves at a time. I find that I can remember up to 20 hand moves at a time having only been through them twice. I could probably remember 40 hand moves if I went through it 4 times. Foot moves are a different story - it takes a lot of practice on the route itself to be able to remember how these tie in with the hand sequence.[431]

The more difficult a climb is, the more likely the climber is to seek different types of aids, such as drawings, photographs or models[432] to help him remember the correct sequence of moves. Most climbers will seek to find the methods that best will lessen the dangers involved in climbing and the use of drawings as a way to help remember moves and sequences was certainly one of these. Steve McClure, another contemporary climber, explains how he uses drawings for the same reasons as Neil Gresham described above:

> With long term projects, like taking 20 days or so I do make a plan of the route with a little map showing all the holds, and dotted lines showing movement of left hand, RH, RF, LF.[433] This is partly a memory thing in case I end up not on it for ages, but also part of the process of becoming one with the route, letting it all sink in and learning all the subtle movements. Its even possible to see things while making the map, like why did I use my left hand here rather than my right etc. [...] Generally I don't need the map, the making is more of a setting in stone of the sequences and becoming even more familiar. Generally after a few hours on a route I'll know all the hand moves, and after a few days every hand and foot move.[434]

[431] Email correspondence with Neil Gresham, 11th August 2008, see appendix, p. 257
[432] For example, contemporary climbers make models at a scale of 1:1 of the most difficult sections of a climb on a climbing wall.
[433] RH = right hand, RF = right foot, LF = left foot.
[434] Email correspondence with Steve McClure, 4th August 2008, see appendix, pp. 257-258

The passage by Gresham is particularly interesting because the drawing, it seems, helps McClure to become 'one with the route'. The process of drawing, then, must have the ability to engrain aspects of haptic experience, and that in some way the making of the drawing helps the 'setting in stone' of the whole sequence of the climb. The drawing below (figure 37) is an example of such a drawing by a French climber, recreated by the artist Dan Shipsides.



37 Duel by Phillipe le Denmat

It may seem like an unlikely parallel to draw, but like these contemporary climbers, Philibert Delorme's stoneworkers depended much less on the drawings than the drawings themselves suggested. He wrote for example that his 'designs are never carried out exactly as they are shown' and that he does 'not draw [his] figures as precisely'[435] as they are presented in his treatise. Instead, the stoneworker 'by casting their eyes' on these relatively approximate drawings 'will immediately understand', he says.[436] The stonecutters, like the climbers, depended instead on this ability to 'engrain' all aspects of the activity, that the 'design' can become 'wired' in his mind and that he can 'becom[e] one with' the stone. In the two practical books on stonecutting, Books III and IV of the *Le Premier Tome de l'Architecture*, Delorme indicates

[435] Delorme, *Le Premier Tome de l'Architecture*, fol. 106v/p. 244
[436] Delorme, *Le Premier Tome de l'Architecture*, fol. 61v/p. 154

in several places that his work on stonecutting was achieved because of what he calls 'spiritual labour' both in the creation of his drawings as well as the architectural constructions to which they referred.[437] Although Delorme does not explain directly what he meant by this labour, a study of his text reveals the context by which something 'spiritual' was employed during both the theory and practice of drawing, as well as the cutting and construction of stones. 'Geometry' and 'great spiritual labour',[438] he observes in Book IV, were the two most important factors which he claims assisted him whilst designing his famous trompe at the Château d'Anet:

> I discovered the cut and invented the artifice in the year 1536, by the help of Geometry as well as great spiritual labour [...].[439]

The example from Delorme's text is tremendously important for our knowledge of how a mason, just turned architect, in the sixteenth century worked. Although Delorme was one of the first to embark on the development of a science of stonecutting (stereotomy), his text suggests something *other* than the systematic and rational processes of the practical treatises which began to develop around the sixteenth century, and which underpins much of Delorme's work. 'Spiritual labour', as the words themselves imply, was something that could not be carried out according to methods centred primarily upon a material reality.

At the beginning of Book III Delorme introduces these 'spiritual', rather than material, matters. An architect, he writes, should be a 'learned and wise man' and Delorme uses the drawing of an architect as he emerges from a cave (figure 38) to illustrate that the cave is 'de contemplation, solitude, et lieu d'étude', that is, 'a place of contemplation, solitude and study'.[440] In this cave, or place of darkness, Delorme continues, the architect will be able to 'attain to the true knowledge' of his art and he continues that the architect, by means of 'précogitation, discrétion et prévoyance' - 'forethought, discretion and foresight',[441] will be a good architect. In Randle Cotgrave's *Dictionarie of the French and English Tongues* (1611), an important account of the French language in the 16th century, the entry for the French 'contemplation' reads:

[437] See for example Delorme, *Le Premier Tome de l'Architecture*, fol. A4v, fol. 58v, fol. 61v, fol. 80r and fol. 91r
[438] Delorme, *Le Premier Tome de l'Architecture*, fol. 91r/p. 213
[439] Delorme, *Le Premier Tome de l'Architecture*, fol. 91r/p. 213
[440] Delorme, *Le Premier Tome de l'Architecture*, fol. 50r/p. 129
[441] Delorme, *Le Premier Tome de l'Architecture*, fol. 51r/p. 131

> contemplation, deepe consideration, inward beholding of, profound musing on, a matter.[442]

This ability for deep contemplation, or 'inward beholding', alongside 'précogiter' - 'to precogitate, premeditate, think of beforehand'[443] and 'prévoyance' - 'foresight',[444] indicates that the architect had to have something more than just intellectual skills, and that he had to employ a range of cognitive skills. That the architect in the sixteenth century became an intellectual rather than manual labourer is something seen throughout the earlier chapters in this thesis, but now it becomes increasingly obvious that architects such as Delorme saw a professional architect as someone who also were required to have profound cognitive abilities. Moreover, because the concept of the 'spiritual' did not receive any particular attention in the treatise, it seems that whatever the spiritual must have meant during this period, an instinctive understanding of the term was assumed upon the reader. When Delorme used terms such as 'spiritual labour' throughout Books III and IV it seemed as if the spiritual, for him, reflected a 'labour' or effort that engaged these cognitive processes of 'contemplation', 'forethought' and 'foresight', but what, more precisely, did this mean for the sixteenth century architect?

As a humanist Delorme was concerned with the individual and with the rediscovery of ancient Greek and Roman philosophy – and Delorme's repeated reference to Plato would at first suggests that his idea of the 'spiritual' followed, at least in part, Plato's ideals. Plato's idealism was based upon the premise that reality only consisted of spirit and mind, furthermore that knowledge was innate and that the only method for discovering truth was through introspection,[445] hence Delorme's reference to 'contemplation' and his illustration of the architect coming out from his cave. (See figure 38) However, Delorme makes it clear throughout his treatise that *experience* is the true source of learning a craft, and although Cotgrave's entry for 'esprit' includes 'mind, thought; opinion; wit, [and] conceit', as well as 'Soule' and 'The Spirit'[446] it

[442] See entry for 'contemplation, *fol.*' in Cotgrave, Randle. *Dictionarie of the French and English Tongues* <http://www.pbm.com/~lindahl/cotgrave/> [accessed 15 February 2012]
[443] See entry for 'precogiter' in Cotgrave, Randle. *Dictionarie of the French and English Tongues* <http://www.pbm.com/~lindahl/cotgrave/> [accessed 15 February 2012]
[444] See entry for 'prevoyance' in Cotgrave, Randle. *Dictionarie of the French and English Tongues* <http://www.pbm.com/~lindahl/cotgrave/> [accessed 15 February 2012]
[445] Grider, Clint. *Foundations of Cognitive Theory: A Concise Review*, 1993, p. 4 (Bell-Gredler 1986) [http://www.eric.ed.gov] accessed 22 March 2012
[446] See entry for 'esprit, *m.*' in Cotgrave, Randle. *Dictionarie of the French and English Tongues* <http://www.pbm.com/~lindahl/cotgrave/> [accessed 15 February 2012]

nevertheless seems that 'spiritual labour' in Delorme's text would refer to the first three entries. Hence, it would refer instead to the ways in which knowledge is acquired through the individual's ability to think, reason and understand experience rather than to knowledge that is in any way innate or acquired from supernatural powers that in any way are attributed to a deity. The 'spiritual' in Delorme's text refers instead to a range of cognitive abilities and intellectual thought being one of these, something that reflects his view on the professional architect as an intellectual. This is also consistent with the then current ideals that an architect should be an intellectual, well read and be able to master his craft equally well in theory as in practice. This is another indication that his use of the term 'spiritual' implied a strong connection to the processes of thought because, alongside practice, it was what the Renaissance architect should know. It may indeed be, then, that whatever the spiritual meant for Delorme it was something that had the capacity to replace those functions the drawing ordinarily would have provided. The following will begin to expound on what kinds of cognitive activities, or 'spiritual labour', the two disciplines made use of as techniques in their spatial practice.

38 The architect emerging from the cave.

From being 'blind' to 'mental photography'

One of these cognitive skills was the ability to memorise and thus visualise, which we saw the climbers explain earlier. Accordingly, in order to continue from this discussion, it will now be shown how the mountaineers in the late nineteenth and early twentieth century talked about the experience of being 'blind' whilst climbing. This will allow us to make the conceptual leap from the use of drawings and other graphic representations, to 'spiritual labour', and then to what Pilkington calls 'mental photography'. The experience of being 'blind' was something Geoffrey Young described in his chapter on rock climbing and the term referred to particular moments when a climber negotiated large slabs of rock. On slabs, there is a great chance of being what he calls 'spread-eagled'[447] because on a slab, which by its very nature is a relatively flat piece of rock angled at less than 90 degrees, losing sight of the route is easy:

> Let nothing tempt you to alter your plan once you are moving. This is the hardest lesson to learn. If you have any eye at all, your alteration will never be for the better. Whenever, as must occur in awkward places, your sight of the holds is interrupted, keep your head and stick coolly to your recollection. Many climbers get slightly flurried once they are 'blind'. They forget their plan, even the existence perhaps of the one hold that made the passage seem possible [...].[448]

'This liability to flurry', Young continues, 'may take years to master', and he promptly advices the reader that the 'only protection is foresight'.[449] Young's reference to 'foresight' is reflected in Delorme's use of the same term as we saw earlier. Thus, what Young is actually proposing here is that in order to climb the route successfully the climber must make a detailed and strategic selection of hand and foot moves before setting out on the route, and that these holds, he says, must be used just as the climber 'designed'[450] them. This 'plan' of the route must be brought back to mind as a 'recollection' during these 'blind' instances, but as Young alludes to, it is very difficult to stick to the original 'design' because, during these blind sections of the route, climbers naturally get very nervous, or 'flurried', as Young wrote.

[447] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 166
[448] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 166
[449] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 166
[450] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 166

Clinton Dent had also identified a few years earlier that 'it is not sufficient to merely reconnoitre and note down, or even (the best plan) to sketch what is seen',[451] and he continues that

> Unless a man keeps his wits well about him, his mind will but stagger feebly over the information he has himself collected, and fumble among his amassed facts. It requires a cool head and judgement to utilise knowledge and experience. People collect facts, but do not always know how to pack them so that they can be readily got at when wanted.[452]

Carruthers and Ziolkowski have argued that, in common terms, memory is something which 'specifically connotes 'storage' [...] ', and that it is like 'a treasure house both of experiences and facts.'[453] Although Dent is not referring directly to memory here, he says that 'the information he has [...] collected' can be 'pack[ed]' away and 'got at when wanted', and that this information is neither found in 'reconnoitring' nor in his 'note[s]' or 'sketch[es]', but rather in his 'knowledge and experience'. What Dent thus brings forth is this meaning that memory commonly has, and as Carruthers and Ziolkowski argued, and thus what he is actually saying is that the climber must unpack, so to speak, from his memory these 'amassed facts'. This kind of memory, however, is what Carruthers and Ziolkowski call a 'passive model' of memory and that in order 'to make use of memories [...] we must recall them to our active awareness, our knowing'.[454] This is precisely what Dent must have been aware of when he wrote that the climber's 'mind will but stagger feebly' over all this collected information and that the real skill was being able to utilise this knowledge which is 'collected' and 'pack[ed] away' as memory. In order to utilise it the climber must 'keep his wits well about him', Dent writes, and he must have a 'cool head' and the ability to make 'judgements' – all of which suggests an 'active' form of awareness in opposition to the passive method of storing the amassed knowledge.

It is this active awareness, then, that Dent alludes to when he writes about a well known problem that climbers have when returning via the same route that they had ascended, but who nevertheless 'fail entirely to follow the identical line'.[455] 'This inability to recollect a route', he writes

[451] Dent, *Mountaineering*, p. 146
[452] Dent, *Mountaineering*, p. 146
[453] Mary Carruthers, and Jan M. Ziolkowski (eds.), *The Medieval Craft of Memory: An Anthology of Texts and Pictures* (Philadelphia, Pa. ; [Great Britain] : University of Pennsylvania Press, 2002), p. 1
[454] Carruthers and Ziolkowski, *The Medieval Craft of Memory*, p. 1
[455] Dent, *Mountaineering*, p. 234

> arises almost wholly from the fact that most people neglect as they ascend to look continually backwards and note mentally the detailed appearance of the rocks viewed from above.[456]

But to 'note mentally' does therefore refer to something more than the otherwise graphic kind of picture that noting appearances mentally otherwise might imply. Dent consequently explains how amateurs tend to think of mountain guides as having this 'faculty' that has the ability to make mental notes of the topographic details almost as an instinct, but there 'is no instinct in the matter at all', he writes, it is 'an acquired quality, the outcome of experience'.[457] By using the term 'faculty', which refers to one of 'the several 'powers' of the mind',[458] Dent again emphasises the ability to make use of knowledge through an 'active', rather than passive, kind of awareness. Dent concludes that

> mental notes of cross bearings in the detail of a line of ascent are as valuable as written notes [...].[459]

The idea that taking 'notes' can be something both 'mental' and 'written' and that the 'mental notes' are here viewed as being 'as valuable as' the written notes, advocates the idea that the two have similar functions. If we can assume that 'mental' involves a pictorial representation and 'written' a verbal, it could be argued that the nineteenth century climbers looked at memory in much the same way as in the Middle Ages where the tools used for 'memory-making': words and pictures, were 'intimately and collaboratively related as devices for composing thoughts and memories'.[460] Carruthers and Ziolkowski argues that in 'medieval learned cultures [...] such a thorough mixing of media, especially the visual and the verbal, was commonplace'.[461] This was also the case with Delorme, who writes that a

> young apprentice [...] must seek out the learned and wise to obtain instruction, both in words, in memorials, writings, and in drawings and models [...].[462]

[456] Dent, *Mountaineering*, p. 234
[457] Dent, *Mountaineering*, p. 234
[458] See entry for 'faculty, *n.*', in *Oxford English Dictionary Online* <http://www.oed.com> [accessed 06 March 2012]
[459] Dent, *Mountaineering*, p. 234
[460] Carruthers and Ziolkowski, *The Medieval Craft of Memory*, p. 2
[461] Carruthers and Ziolkowski, *The Medieval Craft of Memory*, p. 2
[462] Translation in Lefaivre and Tzonis *The Emergence of Modern Architecture*, p. 134

The idea that memory was something 'active' was an idea shared between several writers in the nineteenth century climbing literature. However, when Charles Pilkington in Dent's book writes that

> [c]onstant diligent practice of this mental photography will make a marvellous difference in your power of observation,[463]

it thus seems at first as if he is thinking of a rather more 'passive model' of storage. If the 'careful mental notes' which were taken and any prominent objects 'should be connected in the mind with the route'[464] the act of connecting the mind with the object immediately draws 'mental photography' to something that has a stronger connection to an active use of the mind than it at first seems. The mind as a camera, so to speak, was instead a powerful 'faculty of observation', Pilkington goes on to explain, and 'the power to apply the knowledge acquired' was 'absolutely necessary'.[465] In this way, the mountaineers had several verbal and 'visual spaces'[466] between which they fluctuated; the written notes, the drawings, the photographs, and a 'picture' as it is visualised in the mind. That photography was important in the climber's training as a tool to reconnoitre and learn to see was something we saw in chapter three, however, that the climber's mental powers could be compared with 'mental photography' reinforces not only their ability to record as accurately and detailed as the photographic image, but the *need* to do so.

Judgement, 'the brain as clearing-station' and instinct

Linking to the earlier discussion on memory and 'spiritual labour' we will now consider other cognitive activities that both disciplines used. To make use of several cognitive powers was indeed something the mountaineers during the late nineteenth and early twentieth century discussed in their texts, and it was something which was seen as an essential part of a mountaineer's training, and as we will see, it was also recommended that these powers should be trained. In a passage where Dent makes a comparison between 'snowcraft' and 'rockcraft', the author describes this lesser-known connection that cognitive processes had to the discipline of mountaineering:

[463] Pilkington in Dent, *Mountaineering*, p. 311
[464] Pilkington in Dent, *Mountaineering*, p. 311
[465] Pilkington in Dent, *Mountaineering*, p. 311
[466] A term borrowed from Crary, *The Techniques of the Observer*, p. 1

> Beginners will recognise early that snowcraft is a difficult matter; one that requires judgement, and one in which the head must guide the limbs.[467]

Rock climbing however, he writes, is seen 'more as an amusement',[468] but that it must be taken seriously because 'generally speaking' it 'entails worse consequences' than snowcraft.[469] Hence, in snowcraft, climbers recognised the importance of making careful judgements, whereas in rock climbing they did not. Although Young is merely referring to something which 'requires judgement', what he meant by this was that climbing thus depended upon several processes of thought in ways that were both considered and deliberate.

To make a judgment of something is to perform a particular cognitive act, and to form a sound opinion on where to place hands and feet during a climb depends upon the climber's ability to make an estimate of something that is both worldly and spiritual in nature. Worldly referring to something that belongs to the physical world where visual and other sensual information is at its base, spiritual referring to something that does not have a material reality, such as memory, which was discussed earlier. The ability to plan and successfully execute the climb depends upon this estimate of worldly as well as spiritual matters. Although in this particular part of the book, Dent merely refers to 'judgement' and that the 'head must guide the limbs', there are a number of important clues to the meaning behind these statements in various places throughout the book.

Consequently, when Young writes that the 'lines of communication between toe and finger and eye, with the brain as clearing-station, have to be opened up or reopened',[470] he is referring to the ways in which the climber makes an estimate of these worldly as well as spiritual matters. The 'toe and finger and eye' presumably being the main source of worldly and thus sensual information, and the 'brain' as a place where 'spiritual' matters such as memory and imagination was at the same time located and assessed. Nevertheless, what Young implied was that the climbers were not taking advantage of the faculties of the mind as a tool to analyse this worldly as well as spiritual information and therefore that their 'lines of communication' had to be 'opened up or reopened'. However, as Young proposed, these lines were closed.

[467] Dent, *Mountaineering*, p. 216
[468] Dent, *Mountaineering*, p. 216
[469] Dent, *Mountaineering*, pp. 216-217
[470] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 148

Both Dent and Young refer regularly to the climber's 'judgement', and as judgement really means to make an estimate on something based upon observation, it is clear that what they were referring to was the ways in which powers of observation were trained, but not only of making an estimate of worldly matters but also be able to assess the spiritual. As Dent writes, the 'power of judging is of the highest importance'.[471]

The process of this kind of observation, and of the ways in which cognitive processes could be employed in order to enhance climbing techniques, he writes, was that the climber

> has only to train his eye to select holds ahead which will allow of a sequence of harmonic positions; to train his instinct to imagine beforehand what these positions will be; and to train his body to move from each one of these positions to the next.[472]

The process of learning to climb for Young was thus threefold: 'to train his eye', 'to train his instinct to imagine', and 'to train his body'. The first is a preparation to improve the role of seeing, the second to extend the powers of seeing images in the mind and the third to translate these observations into physical movement. This was, according to Young, the 'ladder of modern technique'.[473] The significance of the first, which was discussed in the previous chapter, is that the eye is trained to select holds 'ahead', Young writes. This meant that the mountaineer had to train the eye to understand what it was that it was looking at, and subsequently be able to see and select a route that would be in a 'harmonic' sequence. Therefore in order to understand the seen, training the eye suggests a skill that is gained through a prolonged involvement in the activity. The author's reference to the second part however, to 'training the instinct to imagine' and thus to the faculty of the imagination, refers to a wholly new technique in the climber's repertoire, but not entirely unlike memory, because both techniques used the skill of visualising the planned route in the mind, the configuration of hand- and foot-holds before the climber makes his assault. 'Seeing' is thus something of both worldly and spiritual matter and Dent's references to judgement, above, accordingly suggests a connection between both of these: the seeing eye and the minds eye, the latter which will be examined further on.

[471] Dent, *Mountaineering*, p. 234
[472] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 145
[473] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 145

Robin Evans, in analysing the processes Delorme employed in his work, also argued, like Young, that the craftsman relied extensively upon the use of pictures that are seen in the minds eye, or the imagination, and not via the real eye. Indeed, what Evans in actual fact proposed was that Delorme would not have been able to draw the trompe at Anet unless he

> had a clear mental picture of the three-dimensional configuration to which it referred.[474]

We saw earlier that Delorme's architect emerged from the cave, his place of contemplation and study and where he had learnt to become a good architect. If for Delorme 'précogiter' and 'prévoyance' meant that designs and inventions could be created through contemplation, and that one could effectively pre-view the forms and shapes of these designs in the mind alone, then it is possible to suggest that Delorme was indeed implying that the ability to 'see' in the minds eye was one of the most significant skills an architect should have. This was, as we saw earlier, what Delorme called 'spiritual labour', a capacity for the architect to visualise and design the forms in spiritual rather than worldly matter. Conversely, and in opposition to Plato, because Delorme throughout his treatise talks about the importance of experience, it seems that he also believed that the forms arisen out of 'précogiter' and 'prévoyance' occurred from experience which was then stored in a specific location, in thought, and actively recollected when needed. It may be, then, that Delorme's 'spiritual labour' meant both memory and imagination simultaneously, that the two were interconnected and used during the processes of design.

In this way Young's idea of 'imagin[ing] beforehand' the route up the mountain therefore reflects Delorme's idea of 'précogiter' and 'prévoyance', because to imagine the route beforehand in mountaineering depends both upon prior knowledge of climbing as well the ability to memorise topographical details. However, without prior knowledge and the ability to reason from such knowledge, simply recognising the topographical signs would merely be an ability to recognise signs that have no meaning. Young's 'ladder of modern technique' thus implied the ability to judge worldly matters as well as spiritual matters and this is what Young calls 'instinct'. Accordingly, because his idea of an 'instinct to imagine' could be trained, it suggests that Young in actual fact meant that this knowledge was experimentally testable,

[474] Evans, *The Projective Cast, Architecture and Its Three Geometries*, p. 189

which is fundamentally the opposite of anything that is instinctive or innate[475] and raises instead the question of what he meant by 'instinct' and how these were acquired.

It is interesting that Young's view on 'instinct' varies throughout his book. In a couple of places his view is critical, and relates specifically to the skills of a mountain guide, which he in this connection calls a 'peasant'. He writes for example that few

> peasants will be able to help him much by explanation. They act on instinct and experience; the reasons they may be induced to give are less likely to be correct than the conclusions which an intelligent amateur can draw for himself.[476]

Nevertheless, he says that the amateur 'should hold his tongue' and 'learn all he can' from the guide and after acquiring 'a mass of small precedents' and 'intelligently applied, will prove often of even more service than the local guide's instinct'.[477] Further on, however, he writes for example that 'the guide is taken because he is technically better qualified and has also, by local knowledge, instinct, etc. a larger proportion of the qualities necessary [...].'[478] Young does also at times express the idea that instincts as a climbing skill could be inherited: 'each new generation of climbers appears to inherit, almost as in instinct and without visible or conscious study, a greater adaptability, an easier apprehension, as it were'.[479]

However, despite this observation on inherited skills, it nevertheless seemed that Young did not see knowledge in any way as a gift, nor did Delorme, and they therefore seemed to share the Empiricist idea that our understanding of the world 'is the product of our individual labor [...] the general ability to reason, and [that] this includes the ability to acquire knowledge from experience [...].'[480] As Jerry Samet concludes, in the Empiricist view we 'fully own our knowledge: we collect the raw materials and add our mental labor to create it.' In this way both Delorme and Young opposes the Platonic idea that one develops the intellect by strongly contemplating innate knowledge.[481] However, this labour was neither easy nor uncomplicated, and

[475] Paul Griffiths, "The Distinction Between Innate and Acquired Characteristics", *The Stanford Encyclopedia of Philosophy* (Fall 2009 Edition), Edward N. Zalta (ed.),
<http://plato.stanford.edu/archives/fall2009/entries/innate-acquired/> [accessed 20 Aug 2012]
[476] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 115
[477] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 115
[478] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 119
[479] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 105
[480] Jerry Samet, 'The Historical Controversies Surrounding Innateness', *The Stanford Encyclopedia of Philosophy* (Fall 2008 Edition), Edward N. Zalta (ed.),
<http://plato.stanford.edu/archives/fall2008/entries/innateness-history/> [accessed 18 Aug 2012]
[481] See for example Peter Markie, 'Rationalism vs. Empiricism', *The Stanford Encyclopedia of Philosophy* (Summer 2012 Edition), Edward N. Zalta (ed.),

any means by which the 'spiritual labour' could be reduced was sought by both disciplines. As Delorme pointed out:

> in order to shorten their effort and not lose time they can request the advice and understanding of those who make a profession of Geometric cuts and are learned in the practice and theory of Architecture. These will make them understand promptly and with few words what would otherwise be sought with long labour and spiritual fatigue.[482]

In order to achieve this level of mastery it therefore required 'great spiritual labour' and 'fatigue', as Delorme writes, and a continuity of 'mental concentration', as we saw Young write. The significance of this 'labour' was that it required of both disciplines an unusual amount of intellectual and cognitive effort, processes that involved abstract thinking and reasoning. As Delorme draws attention to, without the advice of 'those who make a profession' of the art, to arrive at a true understanding of it, the effort involved in such abstract thinking and reasoning would for the amateur and reader of his treatise undoubtedly cause 'spiritual fatigue'.

Visualisation, nerves and mental rotation

The struggle with the enormity of the mental labour which was involved in the craft was reflected also by Young who wrote that the

> interrupted continuity of our earlier struggle (with) step and grip hold involved a disturbance of the balance and a break in the continuity of mental concentration.[483]

The 'mental concentration' which Young here refers to, signifies the effort required of the climber to memorise the route as a whole and make informed judgements along the route, based upon both innate and acquired knowledge. The clue to its success lies in being able to do all of these things as a 'continuity', that is, as a continuous flow of what Delorme calls 'spiritual' or mental labour alongside the activity. The passage draws attention to the fact that climbing requires of the mountaineers to direct all their efforts towards this labour of the mind, just like the architect who just emerged from his cave. Young stressed that the need for 'mental concentration' originated from the

<http://plato.stanford.edu/archives/sum2012/entries/rationalism-empiricism/> [accessed 19 Aug 2012]

[482] Delorme, *Le Premier Tome de l'Architecture*, fol. 80r/p. 191

[483] Young, *Mountain Craft*, Charles Scribner's & Sons, New York, 1920, p. 147

'severe', and what was then seen as a 'modern', type of climbing. Climbing and mountaineering saw great technological changes during this time and as Young continues, despite these improvements to the art, the ability to climb to a standard that was current at the time of his writing, was a challenging one and was

> as much a matter of mental fitness as of bodily fitness[484].

At times, Young blurs somewhat the distinction between 'mental fitness' and what he calls 'nervous control' and sometimes refers to the 'imagination' when really he means the ability to control one's 'nerves'. He says for example about the person leading the current rock climbs that it demanded 'initiative, imagination and nervous force, added to a suitable physique'.[485] Further on, he describes how the rhythm of the mind, nerve and muscle were working 'at the same high tension to the same deep tune'.[486] Imagination and nerves are here working together and they account for the 'mental fitness' that Young discussed above.

In Clinton Dent's earlier publication from 1892 we can see evidence of the term 'imagination' being used as an ability to control emotional response in a similar way to Young's 'nervous control'. Dent writes for example about the reasons why 'descending rocks' is seen as more difficult than ascending - a 'partial explanation', he writes

> is to be found in the effect on the imagination of looking down any place.[487]

As Dent observes, 'standing on a steep rock face but little of the route to be followed can be seen';[488] the emotional response - 'nerves' - occurs. Once these nerves are under control, he writes, the climber can instead make use of the imagination as a source from which to provide the climber with the techniques that could help resolve difficult problems, and the imagination becomes a significant tool in the climber's repertoire of techniques to master his craft in this respect.

In a passage from the later 1945 edition of Young's book, we can observe this change in his understanding of the imagination:

> The nerves become, and can remain, trained to height and exposed climbing. Imagination, which used to be an enemy, is now enlisted on

[484] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 149
[485] Young, *Mountain Craft*, Charles Scribner's & Sons, pp. 150-151
[486] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 151
[487] Dent, *Mountaineering*, p. 233
[488] Dent, *Mountaineering*, p. 233

> the side of the climber. Where, on his infrequent ventures, he used to eye a cliff as a stranger and imagine himself falling off it, he can now, as a habitué facing familiar passages, only picture to himself how he will climb them.[489]

Whilst the imagination had been understood and associated with the climber's fear of the constant dangers presenting themselves whilst climbing, what Young implied in this passage what the imagination was now instead understood as a *skill* and therefore something the climber should make conscious use of in order to 'picture to himself how he will climb'. The author highlighted in this way not only what the imagination meant to climber, that it was a 'picture' in the mind of how to climb the mountain, but it also drew attention to the fact that an historical change had taken place in the way that the imagination was understood by the climbers.

However, what is interesting about Young's 'continuity of mental concentration' is the ways in which a route, or a design, was thought of and what form it would take in the mind. The significance of this is the ways in which the techniques used by the craftsman affected the form that the design or the climb had in the space of the mind, or in thought, as it were. In discussing Delorme's drawings, Robin Evans made the case that

> the imagination and the technique worked well together, the one enlarging the other, and [...] the forms in question [...] could not have arisen other than through projection.[490]

Although we saw that Evans earlier had observed that the drawing of the Anet trompe, the most complex of Delorme's constructions, 'could not have been made unless Delorme had a clear mental picture of the three-dimensional configuration to which it referred',[491] what Evans actually meant was that the techniques of drawing which Delorme employed in actual fact gave thought the possibility of fabrication.[492] In this way it was therefore a two-way system where thought and technique would effectively collaborate and both 'designs', that is, both the climb and the building as they were executed in three dimensions would be influenced by one 'enlarging' the other.

The techniques in stonecutting are difficult and less easy to explain than the ones used in climbing. As Joseph Rykwert put it, the problem in stonecutting is as

[489] Geoffrey Winthrop Young, *Mountain Craft*, 7th edn (London: Methuen & Co., Ltd., 1945), p. 114
[490] Evans, *The Projective Cast, Architecture and Its Three Geometries*, p. 180
[491] Evans, *The Projective Cast, Architecture and Its Three Geometries*, p. 189
[492] Evans, *Translations from Drawing to Building and Other Essays*, p. 180

follows: 'given a plan, how do you arrive at a proportional elevation, how do you figure it?'[493] Evans, in explaining the true complexity of the techniques Delorme used, says that Delorme's drawing of the Anet trompe is in fact constructed of 15 separate drawings superimposed on top of each other and that each one 'represents a different horizontal or vertical slice through the trompe; each is therefore a more or less cryptic 'picture' overlaid on the others in such a way as to give the required information.'[494] The procedures of the drawings are based upon the rules of projective geometry and to get the correct shape the lines must be folded and rotated at 45°, but this is not done by a number of mathematical operations but rather 'through the manipulation of dividers', as Rykwert correctly points out.[495] Nevertheless, what this implied was that the ability to visualise spatial relationships did not depend solely upon a prescribed set of 'transmutations' from the two-dimensional drawing to the three-dimensional object, but that working with spatial folding and rotation in two dimensions greatly improved the architects ability to visualise such folding and rotation in such a way that they could influence the process from the start and thus also the three-dimensional design outcome. As a consequence, the ability to 'see' and understand complex spatial relationships was 'enhanced by' these methods of drawing,[496] and it was not solely about having prior skill in the ability to visualise that mattered but the ways in which the techniques of visualising space through the drawings and visualising space in the mind affected one another.

Because it is this particular kind of spatial folding and rotating that has to be repeated successively when the stoneworker *applies* the templates to the stones, it is clear that it must be this skill that Delorme describes as 'a different understanding' in his treatise. Delorme observes for example that

> as much as one may have the knowledge to construct all the templates there is needed *a different understanding* to know how to apply them and trace the stones to have them cut. The methods cannot be readily shown, and cannot be understood from writings if one does not see them in effect and in practice.[497]

By 'the knowledge to construct all the templates' Delorme is referring to the processes involved in following the rules of projective geometry, as we saw above, where a

[493] Joseph Rykwert, 'On the Oral Transmission of Architectural Theory', *AA Files 6*, 1984, p. 19
[494] Evans, *The Projective Cast, Architecture and Its Three Geometries*, pp. 184-6
[495] Rykwert, 'On the Oral Transmission of Architectural Theory', p. 21
[496] Evans, *Translations from Drawing to Building and Other Essays*, p. 180
[497] Delorme, *Le Premier Tome de l'Architecture*, fol. 78v/p. 188

number of drawings are superimposed on top of each other whilst the templates begin to emerge from the whole. However, once all the templates have been found, what Delorme observes here is that the stoneworker needs a 'different understanding' in order to 'apply' the templates to the blocks of stone than those he needed to draw or trace them out.

39 Stonemason Pedro Pablo García placing the templates, Spain, 2010

What Delorme conveyed was therefore that the stoneworker and the architect had to have two types of spatial visualisation skills. One where the stonecutter is able to visualise the three-dimensional construction in the image of the two-dimensional drawing, and the other where he is able to apply the templates, in real size, onto the blocks of stone and that the stones are assembled correctly. The skill of visualising from two to three dimensions, as well as the skill of mentally rotating and folding three-dimensional forms, merged with one another or at least affected each other. In the illustration above (figure 39), the stoneworker places one of these templates onto a stone of a corner arch, but without the kind of spatial understanding of the three-dimensional forms that Delorme calls 'different', the stoneworker could very easily place the templates on the wrong side of the stone, or back to front, or even upside down. This, despite sounding absurd, is a very easy mistake to make because it relies upon an extraordinary ability to make a series of mental rotations of the two

dimensional templates before being able to apply the templates by correctly assembling them into a three-dimensional object. Delorme, who was the son of a master mason and trained in stonemasonry, would have had extensive experience of these visualisation skills and thus a sort of 'intuitive' understanding of it, to use Young's term. However, Delorme probably did not have a way of conveying in writing what this skill was, because although he understood it very well, it was not something that could easily be explained or described in words.

It was not, however, only the stoneworkers and architects who found this 'mental labour' difficult. Clinton Dent writes for example that when

> a man has become hopelessly entangled on rock, he can often set himself straight by simply taking hold with his left hand in the same place that he had anchored himself with his right [...].[498]

The term 'entanglement' is ordinarily associated with a state of mind, a mental confusion or a complicated situation, but the word also brings to mind *lines*, and we often think of something being entangled as things that have a distinct linear quality. These could be thin cords, hair, twine, fibres or wire, to mention a few, and are the kinds of things that can easily be entangled, and can get twisted together. Implied in Dent's expression, then, of being 'hopelessly entangled', there is a strong connection between the drawing of lines in stereotomy and the climbing lines in mountaineering. What in mountaineering is referred to as 'lines' is simply a selection of topographical details of a mountain or wall, assembled into the climbers 'route' as it may otherwise be called. What Dent meant by the climber becoming 'entangled on the rock' may therefore be interpreted as a climber who was unable to visualise the climb's configuration of lines, or topographical details, in the mind during the climb and so finds himself 'anchored' with the wrong hand. The climber attempts to negotiate the line he holds in his mind with the actual climbing line in the mountain that becomes actual and real once the climber begins to make movements across the surface of the rock. Unlike the architects drawn lines, the climber's lines do not exist other than in the mind and only temporarily as the climb is completed. If, as Dent writes above, the climber can 'set himself straight' by swapping the left hand for the right hand, then it is clear that the climber must also be able to perform the kind of 'mental rotation' that we saw Delorme's stoneworkers did.

[498] Dent, *Mountaineering*, p. 224

Leon Battista Alberti also wrote in his treatise *On the Art of Building in Ten Books*, a century earlier than Delorme, that it 'is quite possible to project whole forms in the mind without recourse to the material.'[499] However, in order to do such a thing, and to imagine these hand and footholds in their exact sequence, required from the climber a 'continuity of mental concentration'[500] during a climb. This 'continuity' is well explained by Dave MacLeod who as we saw earlier does not use drawings to aid his climbs but that he 'just remember[s] the moves in [his] head'. The interesting thing about MacLeod is the form that the configuration of lines takes in his mind, he writes that

> I play moves back in my head so often I don't even realize I'm doing it.[501]

That the moves can be 'play[ed] back' in the climber's head confirms Young's idea of 'continuity', a flow of information through the minds-eye, as it were. In this context it is important to realise the type of climbing that MacLeod is referring to; the climbs are not only supremely advanced technically and thus also outside the perimeter of existing climbing grades, but also on a scale which entails an ability to remember and visualise more than three hundred hand and foot moves, plus having to remember the locations for all the equipment, in their correct sequence.

Robin Evans earlier observed what be believed to be a remarkable and necessary ability by Delorme to visualise the spatial configuration of the trompe at Anet in order to both design, draw and build it. This, added to the fact that the cut of the trompe at the Chateau Anet was of a very advanced technical level during his time, it could then be understood that Delorme's trompe and a climb such as 'E11', which by MacLeod, is of comparable technical difficulty. MacLeod continues that

> I can play it [the sequence of moves] back either 'inside' myself as if I was climbing it, or from 'outside' as if I was watching myself. I also find I can improve my sequence by doing this i.e. I can discover a way to climb a sequence more efficiently by playing back the different options the hand and footholds offer without being on the route to try it. Quite often when I go back to the route and try it out, it works. [502]

As we saw earlier, Young indicated that this ability to imagine or visualise the position of his limbs must be trained to become instinctual. By attempting to understand what

[499] Leon Battista Alberti, *On the Art of Building in Ten Books*, translated by Rykwert Joseph, Leach, Neil and Tavernor, Robert (Cambridge, Mass, London: MIT Press, 1988), p. 7
[500] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 147
[501] Extract from email correspondence with Dave MacLeod, June 29th 2008, see appendix, p. 257
[502] Extract from email correspondence with Dave MacLeod, June 29th 2008, see appendix, p. 257

Young really meant by training the imagination to become instinctual, MacLeod's example would perhaps serve this purpose well, because as he says 'I don't even realize I'm doing it'. MacLeod accordingly represents someone who would have been a master of his craft in the ways that both Young and Delorme expresses throughout their books and MacLeod's extraordinary skill also represents the type of innate skill, or skill that could be trained to become so, that Young was alluding to earlier.

MacLeod's example is extraordinary and especially the way in which he describes his ability to 'play' the moves back in his head, both from an internal and an external perspective. What Evans described as a 'clear mental picture' for Delorme, is for the climber a picture that is dynamic and reflective of their movements. It is unlikely that Young would have been able to envisage that a picture of the climb's hand and footholds could entail anything like the moving image that MacLeod describes, because the rock climbing abilities were at that time far below the technical standards we have today. Nevertheless, Young must have had an awareness of this skill, albeit on a somewhat lesser degree or on a smaller scale. In this way, it should now be possible to suggest that the stoneworker's experience of stonecutting would have created something like the 'moving image' that MacLeod experienced, also when trying to visualise the traits and especially with the complex design of the trompe at Anet.

These visualisation skills, the mental foldings and rotations, was what Delorme was referring to when he wrote that that many intelligent workers would

> immediately understand these cuts simply by casting their eyes upon them, and having the compass in hand will easily find the relationships, and this is why I do not discuss the matter any longer.[503]

Hence, Delorme did not find a reason to justify using too many words to describe them. That the workers could 'simply by casting their eyes' upon the drawings and presumably also be able to translate from the drawing 'immediately' and rotate all the templates correctly in the mind, implied that the workers had 'a penetrating ability to visualize spatial relationships,'[504] and thus an extraordinary ability to translate from two to three dimensions. This was what Evans called a 'transmutation'[505] that takes place between the presentation of the drawing as an image and the processes by which its form changes from one mode to the other in the mind and eventually onto its

[503] Delorme, *Le Premier Tome de l'Architecture*, fol. 61v/p. 153
[504] Evans, *Translations from Drawing to Building and Other Essays*, p. 180
[505] Evans, *Translations from Drawing to Building and Other Essays*, p. 160

transformation into three dimensions. And the more complex the drawings are, the more difficult this process becomes.

Conclusion

It is clear that both disciplines employed cognitive powers as tools to master their craft, and far from being exaggerated in the texts; their role is evident throughout the texts. Although their significance is clearly observed in the books, little more exists within these texts to build further on their role, because it was not appropriate in the otherwise practical treatises. However, with the practical role cognitive activities had within the crafts, the subject may very well have adopted a chapter of its own, but cognitive activities as a tool was not likely to achieve this status in any formal way in what was otherwise very practical kinds of disciplines. Nevertheless, the texts advocate the skills of memorising, imagining, picturing in the mind, visualising, making mental rotations and foldings because they all were indispensable in order to master the two crafts. Steve House summarises the skills examined in this chapter well: 'Climbing is about process, not achievement', he writes,

> The moment your mind wanders away from the task of the climbing at hand will be the moment you fail.[506]

Whilst there were no cognitive theories from which the craftsmen could draw their ideas from, since these only developed in the middle of the twentieth century, nineteenth century thinkers took for granted conscious experience and treated it in the same way as perception.[507] As a result, the authors did not *systematically* reflect upon its use, but it nevertheless manifested itself as an essential part of the techniques they used in order to gain a sense of mastery of their craft and space: the building and the mountain. Although both disciplines relied much upon their observational and representational skills, as seen in the previous chapters, they also developed a profound ability to use the faculties of the mind as a tool both to observe, record and 're-present' space and spatial activity and this was essential parts of the way their crafts were mastered.

[506] Steve House, *Beyond the Mountain* (Canada: Sinclair Publishing, 2010), front flap
[507] Bernard J. Baars, *A Cognitive Theory of Consciousness*, (USA: Cambridge University Press, 1995), p. 113

6

Clouds & Falling Stones

The Pursuit of Aesthetic Pleasures as a Way to Master Space

In the previous chapters the architect and the climber had to be a master theoretician, a master practitioner, a master of graphic and verbal descriptions as well as a master of cognitive processes, such as memory, abstraction and imagination. What this chapter will attempt to grapple with however, is less about adding another form of mastery to this list, than it is about understanding the driving forces behind the wish to master a craft and the ways in which this force is also at the same time inherently related to the sense of mastery that this project as a whole is concerned with. This idea is far more complex to understand than the concepts of mastery presented earlier because this driving force; aesthetic pleasure, is not only a means by which choices are made but also the end result. The concept of the aesthetic presents us with several problems: first, the assumption that architecture and mountaineering: the aesthetics of art, which architecture belongs to, and the aesthetics of nature, which mountaineering belongs to, can be discussed under the same umbrella, so to speak. Second, that aesthetic judgement and aesthetic experience in the sixteenth and the nineteenth centuries can be compared, and third, the idea that aesthetics relates in some way to the idea of mastery.

The lines of enquiry will seek to find answers from modern thoughts on aesthetics, primarily because the notion of philosophical aesthetics appeared first in the eighteenth century. That is not to say that the architects of the sixteenth century or the climbers in the nineteenth century did not have certain aesthetic principles confined to

their respective time periods and that they were influenced by. However, what this chapter seeks to understand is principles of aesthetics that have a more universal validity and that can move more easily between the two disciplines as well as between the two centuries. Although, at first, the selection of examples may seem merely accidental, this chapter will not deal with 'accidents'[508] in the perception of beauty in architecture and mountaineering. Instead, it will be concerned with forms of aesthetic appreciation that are more universally valid and that drove the two disciplines forward in their quest to master their craft.

Thus despite its relevance to this chapter, I will not take into account the literature that exists on the 'Sublime', nor use this term, but instead seek to use the term 'beauty' or 'aesthetic pleasure'. This is to avoid this historically specific term and thereby complete the quest of this thesis to cross the vast gap between the two disciplines and historical periods and achieve an a-historical tapestry, as it were. It is important to understand that this is not in order to ignore the fact that the Sublime was an enormously important factor in the development of aesthetic appreciation in the mountains, an excellent account of which can be found in Nicolson's *Mountain Gloom and Mountain Glory*.[509] Rather, it is in order to establish aesthetic appreciations that both disciplines have in common, and as they were used in practice by stoneworkers, architects and climbers then as they are now. In practice this means that at times one could quite easily swap the term 'beauty' with 'Sublime', or even think of the entire notion of 'mastery' of this thesis as a 'Sublime' experience. The difference is that I have chosen not to use the term in the same way as in chapter two I use 'practical geometry' instead of 'applied geometry'. This is in order to emphasise the fact that Diemberger was a mountaineer not a geometrician and that the latter term would not have been in a climber's vocabulary.

The question that led to this inquiry was a specific interest in the role that the aesthetic played in the configuration of lines in the architect's construction and a climber's route up the mountain. The enquiry, then, is general as well as specific: specific in its historical content, general in its aesthetic content. The chapter will focus on some aesthetic qualities that are identifiable throughout both architecture and climbing literature, such as 'difficulty' and the 'unhomely'. It will not so much be

[508] Roger Scruton, *The Aesthetics of Architecture* (Princeton Essays on the Arts; 8), (Princeton, Chichester: Princeton University Press, 1979), p. 4
[509] Marjorie Hope Nicolson, *Mountain Gloom and Mountain Glory: The Development of the Aesthetics of the Infinite* (Seattle ; London : University of Washington Press, 1997)

concerned with why they prefer one aesthetic quality to another, but what it means to do so and what kinds of experiences are derived from it. This chapter, then, which is concerned with two specific historical periods and disciplines, will focus on the experiences they share. What did it mean for an architect to enjoy a design? What does it mean for a climber to enjoy a climb? What kinds of pleasures do architects and mountaineers share and in what way did aesthetic pleasures influence their sense of mastery of space?

The specific: the chapter focuses on *difficulty* and *the unhomely* as two specific qualities that drove aesthetic judgement, and thus also their sense of mastery, in both disciplines. The aim is also twofold, on the one hand it aims to understand what kind of aesthetic judgements architects in the sixteenth century made, here focusing specifically upon Philibert Delorme and the ways in which this is expressed through his drawings and constructions as well as through his treatise. On the other hand the chapter aims to understand how the climber's aesthetic judgement influences the design of a climbing route, or line, during the late nineteenth century and today. Ultimately, the chapter seeks to understand the idea of mastery by using this complex triangulation of arguments. In architectural discourse judgments made on primarily visual aesthetic qualities has been much critiqued in contemporary discourse, however by looking at climbing literature it is evident that aesthetic judgments are here based not only upon visual pleasure, but also on experiencing sensual pleasure. Through the study of both types of aesthetic judgement, this chapter strives to see one spatial discipline through the eyes of another and as a result be able to write a theory of space and spatial activity that does not depend upon previous theories critiquing visual preference, nor those promoting sensual experience. Instead it will attempt to find a new way to embed aesthetic understanding into these two spatial discourses.

The general: in order to understand the terms 'difficulty' and 'unhomely' I will apply modern concepts of aesthetics to the two disciplines, because what both disciplines were interested in has a significant connection to these concepts. In this way, the term 'difficulty' will contend with the modern rationalist idea of beauty as well as the notion of the immediacy thesis. The concept of the unhomely will be discussed through corresponding concepts. The first two being concepts representing distinct types of cognitive pleasures, which arises from thought and the latter from haptic experience as separate from visual experience. It therefore seems important to first look briefly at the object of aesthetic enquiry - that which persists and permeates

the literature of both disciplines historically and continue to do so today; first, its matter: *the lines* and second, its non-matter: *the problems.*

An aesthetic understanding of lines and problems

Lines are central to dialogues on aesthetics in both disciplines, but what is a line? In the climbing literature it is immediately apparent that the idea of lines permeates every page; there are 'historic lines', 'good lines', 'fine lines', 'great natural lines', 'elegant lines', 'wrong lines', 'weak lines', 'freakish lines', 'fancy lines', 'great classical lines' and so on. The 'direttissima' is also a well-known line. Sir Chris Bonnington wrote for example that:

> It's got to be a good line – not just hard – but one that catches my imagination.[510]

Lines are central to the activities of both architects and mountaineers: it is that which defines their existence. Architects create lines not only through the processes of drawing but also through the transmutation of these lines into the construction and assembling of the real building. Climbers, as well as using graphic representations to illustrate a line, create lines through the joining up of the hand and foot-moves during a climb. Without lines there would be neither architecture nor mountaineering. Whilst the architect looks at the lines he has drawn or built, the climber standing at the foot of the mountain looks up on the line he is about to climb, or down on the line he has already climbed. A climber's line is recorded in drawings or photographs and then named and graded in terms of its difficulty. Climbing lines has also been regarded as, and turned into, works of art; better known through the work of Dan Shipsides, an example of which we saw in the previous chapter (figure 37).

'Lines', then, are the topic of largely all dialogues on climbing, not dissimilar to how 'design' is discussed in architectural discourse, and the choice of a route up a mountain is often referred to in the climbing literature as 'a design'. Young, for example, uses this term in several places in *Mountain Craft.* In one place he writes that 'a good leader must be able to design and direct an ascent',[511] in another that he hopes to 'design a route which by reason of its angle [...] should be safe'.[512] Equally, Dent

[510] Chris Bonnington, *I Chose to Climb.* (London: Weidenfeld and Nicolson, 1966), p. 119
[511] Young, *Mountain Craft,* Charles Scribner's & Sons, pp. 3-4
[512] Young, *Mountain Craft,* Charles Scribner's & Sons, p. 386

wrote about the conquest of Mont Blanc as a 'design'.[513] But what did the line, or design, mean for Philibert Delorme, Clinton Dent, Geoffrey Young, and for the contemporary climbers? To what extent did aesthetic concerns influence both practitioners' lines? At what point does the line become an object of pleasure? Contemporary big wall climber John Middendorf said that 'sometimes climbers fall in love with the line, or the idea of a line',[514] but what is it about a line that would make a climber 'fall in love' with it? Middendorf's reflection and distinction between the line as an object and the line as an idea suggests two types of aesthetics; it is a feeling of pleasure that is of the body and the mind at the same time: the first a result of the physical qualities of both the object and the experience, the latter; of activities of the mind. Lines in this latter respect are perhaps best known historically through Vasari's concept of 'disegno'[515] and Alberti's 'lineaments',[516] not to mention the many books on design in recent years. Lines form the basis of aesthetic discussions in both architecture and mountaineering.

Building and climbing, it could be argued, are disciplines that are primarily concerned with function. However, Roger Scruton argues that an architect, for example, cannot simply follow an 'ideal of Reason' and eliminate from his brief everything with an aesthetic aim, because if he does, he would not fully know what it is he is doing, nor be able to fully engage in it.[517] Equally, for the climber, the question could be posed whether he would know why he is climbing and be able to engage fully in what it is he is doing if there were no aesthetic aims also in his brief? Building and climbing, as we saw in the previous chapters, have in common a never-ending quest to solve spatial problems; it is the activity that preoccupies both of them for most of their time. It would, then, be natural to assume that solving spatial problems also has a part to play in the judgement of what is aesthetically pleasing. Architects speak about 'design problems' and 'design solutions', but the question is whether aesthetics is treated 'as one among a set of problems to be solved'.[518] Most often, in architecture, aesthetic considerations are only admitted to be a by-product of design, but not as an aim in itself.[519] This is to an extent also the case with climbing, because under the

[513] Dent, *Mountaineering*, p. 25
[514] Email correspondence with John Middendorf, 21st September 2008, see appendix, p. 255
[515] See Giorgio Vasari, *Lives of the Artist. 1550*, translated by George Bull (New York: Penguin, 1986), p. 25 where he says that 'disegno' is the 'animating principle of all creative processes'.
[516] See Book I in Alberti, *On the Art of Building in Ten Books*, pp. 7-32
[517] Scruton, *The Aesthetics of Architecture*, p. 26
[518] Scruton, *The Aesthetics of Architecture*, p. 25
[519] Scruton, *The Aesthetics of Architecture*, p. 25

pretence of safe routes, aesthetics appears to be the objective in more writings on climbing than not.

Scruton proposes that design, as an outcome of thought, only has a superficial relationship with the architect's problem. 'The concepts we employ', he argues, 'provides us with no practical mastery' and suggests that the reason for this is a lack of an intuitive understanding between the aims and functions of design.[520] Better concepts may locate 'the true nexus', he says, or in other words a better connection between these influences. The idea of an optimal architectural solution has to be understood as one that is derived from a rational being's ability to understand the solution. In architecture, this is quite easy to explain with a number of simple examples, such as how to produce 'the fastest, safest and most economical route between rooms of a hypothetical building'.[521] The design of such a route is thus identical to the 'design' of a route in the mountains, as Young and Dent showed earlier. However, it may happen that a person who enters the building is unable to understand how to get to the room he seeks and instead wanders around in bewilderment. This draws attention to the importance between the theoretical understanding we saw in chapter one, and the practical understanding we saw in chapter two, but aesthetics, Scruton argues, is just one part of this practical understanding, and it is why the topic here has been given a chapter of its own.

The concept of the aesthetic did not appear in literature before the eighteenth century and as James Shelley writes, it 'has come to be used to designate, among other things, a kind of object, a kind of judgment, a kind of attitude, a kind of experience, and a kind of value'.[522] Aesthetic theory has, for the most part, focused on questions that are particular to either one of these designations of the term. Nevertheless, the term aesthetics is, however, often (mis)understood as meaning beautiful. Climbers, for example, often refer to something as being 'aesthetic' when really they mean something 'beautiful' to look at. Delorme, who did not have the term 'aesthetics' during his time, used the term 'beautiful' in his vocabulary on aesthetic matters.

Historically, the concept of beauty was a significant philosophical concept in classical and medieval times, but only in eighteenth century aesthetic theory did beauty become a central concept. This chapter discusses aesthetic (and beautiful)

[520] Scruton, *The Aesthetics of Architecture*, p. 28
[521] Scruton, *The Aesthetics of Architecture*, p. 29
[522] James Shelley, 'The Concept of the Aesthetic', *The Stanford Encyclopedia of Philosophy* (Spring 2012 Edition), Edward N. Zalta (ed.), <http://plato.stanford.edu/archives/spr2012/entries/aesthetic-concept/> [accessed 21 May 2012]

matters on either side of this historical divide. If we take Shelley's 'object' above, there are especially two types that have been dealt with extensively in aesthetic theory: the art object and the natural object. It would be natural to assume that buildings and mountains would each belong to a separate category and therefore be split in their discourse. However, since this chapter is predominantly focused upon aesthetic experience what, more precisely, the object of an aesthetic attention is - matters little. To have an aesthetic understanding, Scruton argues, does neither have a fixed aim nor a body of rules and does not lead to a theoretical understanding. Subsequently, it is clear that the aesthetic is not simply about how something looks, but that through an 'aesthetic understanding our future aims become vivid to us before we are able to formulate them as policies or plans.'[523] Instead, it is *part* of a practical understanding, as he says, a kind of intuition.[524] To have an aesthetic understanding is not about utility or function, but about the quality of an experience. However, in order to have this understanding, he argues, it 'requires us to reflect upon the look and feel of something' and to imagine what something would be like.[525]

Climber Lynn Hill, who was asked what it was about climbing that attracted her the most, outlines very well two types of aesthetic pleasure in climbing:

> In climbing, the aesthetics are very important. There's the aesthetics of the line, and you look at the features and the cracks - that's exciting for me. When I look at a wall, I look for different features - the aesthetics of the route. I like climbs that are steep. My body can swing with motion and I can do acrobatic movements and that, to me, is aesthetically pleasing. I don't like grovelling, for example. Grovelling is when you grunt your way up a large crack and it's not a pretty way to do it. Like when you have to stick your hand or foot in there and pull your way up. That's not aesthetic movement.[526]

Hill's seamless move from describing the visually pleasing to sensual pleasure by the body in motion explains a kind of mastery of the forces, matter, energy and motion. In architectural discourse, what is sensually (or experientially) pleasing, as something separate from the visually pleasing, is regularly ignored in critiques of new buildings.[527] In the paragraph above, Hill describes something that in the aesthetic raises several

[523] Scruton, *The Aesthetics of Architecture*, p. 35
[524] Scruton, *The Aesthetics of Architecture*, p. 28
[525] Scruton, *The Aesthetics of Architecture*, p. 34
[526] Lynn Hill, in an interview with Gasperini, Kathleen, *Mountain Zone*, <http://classic.mountainzone.com/climbing/hill> [accessed 21 March 2009]
[527] For an account of how modern architecture is defined by the visual, see for example Beatriz Colomina, *Privacy and Publicity: Modern Architecture as Mass Media* (Cambridge, Mass.; London: MIT Press, 1994)

significant questions: is the judgement of beauty a result of a judgement of reason through an application of concepts such as 'difficulty' or is it a result of judgement based on the immediacy of sensory experiences?

An aesthetic understanding must be connected to what is meant by the aesthetic, that it is a distinct aesthetic experience; pleasure. In what way, then, do the two disciplines engage with the aesthetic and what is aesthetic pleasure? There are three distinct ways in which the aesthetic is discussed in the mountaineering literature, the first being the visual pleasure experienced by looking at the form or shape of the mountain, second, an intellectual pleasure from having solved difficult problems, and third, the sense of pleasure in the physical movements whilst climbing. For the most part, in the architecture treatises, the use of the term 'beauty' refers most often to something beautiful to look at, but there are other kinds of aesthetic pleasures, such as the kinds of pleasures derived from cognitive processes. In the mountaineering literature, something 'aesthetic' includes pleasures derived from physical activity as much as from looking, and these pleasures, although not as evident in Delorme's treatise, is also clearly seen in more recent literature on stonecutting such as that by Eric Benfield. Delorme's concept of the beautiful refers as much to particular kinds of cognitive activities as well as to the making of the object. However, as we will see, the judgement of how something is visually pleasing is necessarily related to both corporeal and mental pleasures.

The 'difficult' as aesthetic pleasure

Geoffrey Winthrop Young emphasised, as seen in the previous chapters, the necessity for climbers to 'train their eyes' in order to understand the mountains better and as a consequence improve their climbing skills. An account of what this training of the eyes involves and in what way it is related to a perception of beauty is evident in his chapter on reconnoitring. Climbers, Young says, only engage in training their observational skills when it is induced by the necessities of safety, but as he points out, the loss resulting from this lack of training is considerable:

> not only because a developed faculty of observing, and *of reasoning from the observations*, is in itself a valuable permanent possession, but because the neglect involves the failure to see much that is beautiful.[528]

By drawing a connection between looking, reason and beauty, Young appears at first to present us with something like the rationalist view on beauty. The rationalists believed that beauty was a result of reasoning something out; that one would judge something as being beautiful by applying concepts or principles to the object of attention. In the perception of art, this idea is commonly applied. However, Young continues that if

> we are accustomed to wait until beauty imposes itself upon the eye, as in the end it will, and almost flauntingly, in large mountain scenery, we shall have already *missed the discovery of the relations of line and colour and mass to which the beautiful effect is due*, and we are fated to overlook much that is lovely and much that is interesting [...].[529]

Beauty, he says here, imposes itself upon the eye; an idea that contradicts his previous statement that beauty is a result of reasoning. This suggests that the perception of beauty in the mountain landscape does not depend on an act of intelligibility; that it is not the result of a conception of what the beautiful effect was due to. A beauty that imposes itself upon the eye reflects the concept of immediacy about beauty, and the fundamental idea of this concept is that judgements of beauty are not mediated through the application of concepts, but instead is a result of immediate sensory judgements.

However, Young continues that by allowing beauty to impose itself upon the eye, the climber has failed to notice that which the beautiful effect was owed to; the relationship between lines, colour and mass 'and we are fated to overlook much that is lovely', he says. The paragraph in its entirety, then, suggests two types of beauty that the climber could engage in, one that imposes itself upon the eye, and the other, which arose from reasoning. Young was, of course, not trying to write a philosophical account of what beauty was, and as he says: 'of its rewards, in [...] aesthetic pleasure [...] it is not the place to speak in a book of practical counsel'.[530] Nevertheless, in the context of this chapter it is useful to see what sense of beauty the author has and especially how it is presented in a book about the practical aspects of climbing. What Young was interested in, was to write an account of how to do something: how to

[528] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 370 [emphasis mine]
[529] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 370
[530] Young, *Mountain Craft*, Charles Scribner's & Sons, p. ix

climb. It is with this perspective that his account becomes particularly intriguing, because what Young seems to say is that the climber needs to understand beauty, or more specifically what this beauty was an effect of, in order to become a better climber: 'mountains are visible to everybody but not equally intelligible to everybody',[531] he says. Within this rationalisation of beauty the climber would discover even more beautiful things in the mountains, more than that beauty which already had imposed itself upon him. But what kind of beauty is that?

In Young's account, there is a distinct difference in the perception of beauty: first between a beauty that is related to seeing and another, which is related to activity. In order to understand all of this better, the ways in which beauty and reasoning relates to one another needs to be examined. To do so we will study closely the idea that something difficult to do is invested with the qualities of beauty because of the processes of reasoning that is involved, and how the intellect is engaged. Beauty is represented as something that occurs only when difficult problems have been resolved. This will become more obvious by looking closely at Delorme's treatise and his representations of difficulty and beauty. In the following we will see how building and climbing are activities that are experienced as beautiful due to their physical, rather than their visual, qualities.

In Delorme's equally practical treatise on architecture to that of Young's practical 'counsel' on climbing, he associated the idea of difficulty with beauty and the idea that something difficult to do was more beautiful than something that was not, and that the more difficult something is, the more beautiful it is. Difficulty also seems to mean the difficulty in understanding, as well as the difficulty in making. This representation of beauty is particularly clear in Book III and IV. It is also evident that Delorme draws connections between the quality of strangeness with beauty and difficulty. The cut is by Delorme's definition strange, and the stranger it appears, the more difficult it is to make. Or to put it another way: the more difficult it is to make, the stranger it will appear. In Book IV, when discussing a trompe that Delorme had hoped to build in Lyon, he writes:

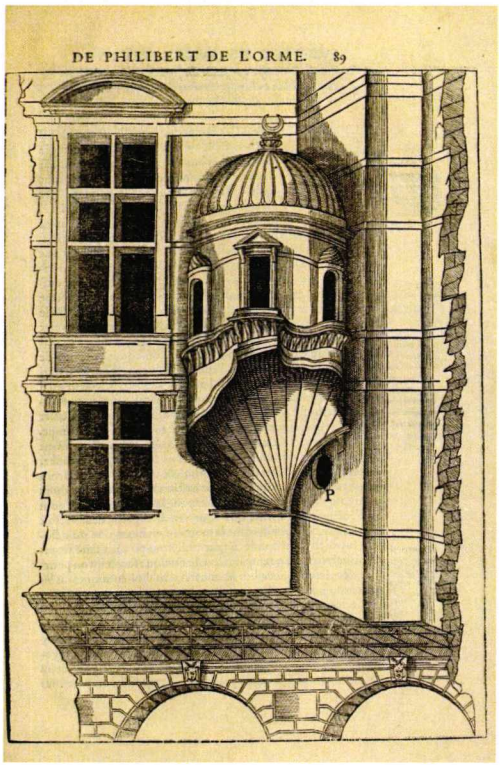
> I would have made it oval in as strange and difficult a manner as I could have thought. That is, I would have built there a cabinet which would have dumbfounded everyone to see such a great projection.[532]

[531] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 372
[532] Delorme, *Le Premier Tome de l'Architecture*, fol. 90v/p. 212

In this way it seems that designing and building a trompe as difficult as his intellect would allow him to and being able to astonish the viewer to speechlessness was Delorme's ultimate aim. Delorme was constantly searching for the most difficult ways in which to design and build his trompes. Why, then, the quality of difficulty takes on the quality of beauty is still not clear, but if the aim was to astonish or surprise, some clues may lie within the wish to cause this effect.

The trompe at the Chateau Anet, Delorme writes, was built because of a constraint: 'The constraint consisted in there not being enough space or a place to fit the cabinet within the main body of the building, which had already been started, nor within the old building that was already built.'[533] After describing this problem, Delorme presents his solution with a sense of pride and it is clear that the more difficult the solution is, the prouder he appears to be. This justification of his construction of the trompe, then, shows how Delorme relates difficulty with the pleasure he derives from solving them. In Book IV he writes that in addition to designing the cabinet he had, by creating the vault half-rampant, inserted an oval shaped window and that this 'makes the trompe a much more difficult (piece of work)'.[534] He impresses upon the reader that he had overcome the problem of the window, and that it was done with great difficulty.

[533] Delorme, *Le Premier Tome de l'Architecture*, fol. 88r/p. 207
[534] Delorme, *Le Premier Tome de l'Architecture*, fol. 88v/p. 208



40 The trompe at the Chateau Anet

It is clear that solving problems and difficulties is something Delorme gains a great sense of achievement and pride from. Accordingly, Robin Evans wrote that this

> leaves the modern reader with the suspicion that the difficulties were as much sought after as found. Delorme, it should be said, used the word difficult as a superlative.[535]

Difficulty, then, was without doubt one of the main motivators and aesthetic aims for Delorme's designs and this was especially evident in designs such as the complex trompe at Anet (figure 40). The idea of difficulty in Delorme's writing seems to be directly related to the intellect and thereby a judgement of beauty that is dependent upon the processes of thought and not upon an immediacy of sensory experiences. 'I cannot help but believe', he says, 'that this beautiful cut, which is difficult, demands that I offer some explanations in order to lead and conduct the reader to the understanding of it.'[536] Whilst Delorme had to explain the cut's difficulties in order for the reader to learn how to make it, what needs to be understood is why Delorme

[535] Evans, *The Projective Cast, Architecture and Its Three Geometries,* p. 183
[536] Delorme, *Le Premier Tome de l'Architecture,* fol. 103v/p. 238

wanted to build something as difficult as possible, and why an object invested with this intellectual challenge would, in his eyes, become beautiful.

Some clues may lie within Delorme's wish to astonish the viewers of his trompe. On a personal level Delorme clearly had a wish to prove his intellectual capacity to the public, and in his treatise he often refers to his designs as 'ingenious and clever'.[537] This arrogance has been repeatedly commented upon in writings on Delorme and according to Anthony Blunt it made him many enemies during his lifetime.[538] The underlying aim for his treatise, which was to establish a clearer divide between architect and mason, further strengthened his wish to repeatedly prove his ingeniousness as well as of the architect in general - knowledge and intellect being the decisive factors in the divide that opened up as a consequence. The architect, he writes, 'has the learning, understanding and industry to direct it well and show the master Mason how to accommodate all things where they belong so that nothing will remain imperfect'.[539] Delorme's quest to separate the architect and the mason was also a wish to raise the architect's standards to a much higher level, one where gaining the title 'Architect' only occurred once proven to surpass 'the judgement, inventiveness and understanding' of the others. Delorme, then, clearly saw himself as having surpassed all the others in this respect.

This way of judging beauty has roots in the development of science and the attention on new inventions that took place in Lyon during Delorme's time. Here, being ingenious and clever was a necessity and Delorme claims proudly that the trompe at Anet was *his* invention. This new invention, and any new invention, had to engage the intellect in ways that Delorme as well as his contemporaries saw as beautiful. This was an entirely original way of looking than what we saw in the earlier treatises where the idea of the 'new' did not exist. Delorme says that 'the Architect who knows these cuts will not be able to excuse himself from discovering an infinitude of beautiful inventions and making things surpassing the judgement, inventiveness and understanding[540] of many who take the name and title of Architect.'[541] Delorme's 'infinitude' referring to the infinite possibilities and many different types of trompes one could design once the system of projective geometry, which stonecutting is based upon, was understood. Here, beauty does not refer to a quality that the object has, it

[537] Delorme, *Le Premier Tome de l'Architecture*, fol. 119r/p. 273
[538] Blunt, *Art and Architecture in France 1500-1700*, p. 132
[539] Delorme, *Le Premier Tome de l'Architecture*, fol. 82r/p. 196
[540] 'opinion, engin et savoir' – Delorme, *Le Premier Tome*, fol. 86v/p. 205
[541] Delorme, *Le Premier Tome de l'Architecture*, fol. 86v/pp. 204-205.

refers instead to a quality of the mind, an intellectual understanding. The aesthetic appreciation of something that is 'difficult', then, and as seen so far, involves both personal, practical and social reasons behind Delorme's strange obsession with that which is difficult to make.

In climbing, the idea of difficulty is inevitably related to safety. When decisions are made on which line of ascent to take one would assume that safety was the main priority, and yet there is a real dilemma throughout the literature on climbing; the challenge of solving a difficult problem persists to act as one of the key motivators for climbing. Owen Glynne Jones illustrated well this persistent attitude towards difficulty as the main motivator in climbing:

> the joy that might have attended our remaining efforts in working up to the head of the chimney was marred by the reflection that we had not *conquered the chief difficulty*, we had only avoided it. [...] Our doubts grew as we advanced, as at last I proposed to descend again and settle them finally. This suggestion was met with a very prompt approval, and ten minutes later found me at the foot of the vertical wall again.[542]

Jones later describes an instance where some climbers, after having 'practically solved the main problem', saw little reason to continue on the climb and 'were contented to work out of the gully by steep 'mantelshelf' climbing up to the left.'[543] It may of course be that the climb Jones describes was a particularly easy route, but the quest still remains the same: the 'main problem' – and the pursuit to solve it. However, what Jones explained above has been opposed by several contemporary climbers' views on what the chief motivation behind a climb is. Ben Heason says for example that the 'aesthetics of the line are the primary motivation, the difficulty of the climbing is secondary.'[544] Steve McClure agrees that there is 'always some aesthetic choices in route selection, [and that] it is definitely not just to do with difficulty [...].'[545]

Nevertheless, climbing routes are referred to as 'difficult' and as a 'problem', and we still find in contemporary climbing guidebooks descriptions of routes that are described as:

> yet another 'last great problem' on the Matterhorn.[546]

[542] Owen Glynne Jones, *Rock Climbing in the English Lake District*, (London: Longmans & Co., 1897), p. 10
[543] Jones, *Rock Climbing in the Lake District*, p. 44
[544] Email correspondence with Ben Heason, 5th August 2008, see appendix, p. 256
[545] Email correspondence with Steve McClure, 23rd August 2008, see appendix, p. 258
[546] Lindsay Griffin, *Valais Alps West. Selected Climbs.* (London: Alpine Club, 1998), p. 424

Whenever this phrase is used in the climbing literature, the word 'great' appears almost always to mean more than just the scale or difficulty of the problem but also how good it is. If the problem of a climb, then, is 'great' - it must somehow be as much sought after as it is avoided. Like Delorme, there is a sense of pride in having overcome the most difficult of problems. Why else would there be such a sense of pride in having climbed K2 instead of Everest? Everest is indeed the taller of the two, but K2, as Kurt Diemberger argues, is

> the more beautiful, more fascinating and quite the more difficult of the two.[547]

Climbing to the top of Everest long ago became much less of an achievement than other, more difficult, mountains. Ben Heason associates the quest for more difficult routes with the idea of *new* routes: 'for us here in the UK, where most of our rock has been climbed, I am more motivated to fill in the remaining gaps to create new routes. These will often tend to be the hardest way up that section of wall.'[548]

The gaze and the puzzle

'Rock climbing', Young writes, 'is a joyous method of getting up attractive mountains by attractive ways.'[549] If climbing is 'joyous', the mountains are 'attractive' and the climbing itself is an 'attractive' way - how, then, is difficulty connected with aesthetic appreciation in the two disciplines? At what point does the difficult become beautiful? When does it not? How can something that is normally understood as being problematic, an obstacle, take on a feeling of pleasure, of aesthetic pleasure? Heason and McClure seemed to separate the idea of the aesthetic with the idea of something that is difficult, but Heason describes later how the challenge is secondary but also that the best situation is where the most difficult line of ascent is also the easiest, which means it is the only way up. In this context, then, the most difficult line is also the easiest and the one that is the most aesthetically pleasing. But, in this pursuit of pleasure, why do people find difficult things pleasurable? What does it mean to get up a mountain by 'attractive ways'? Why did Delorme find difficult designs aesthetically pleasing and why did climbers find difficult routes a source of aesthetic pleasure? What

[547] Diemberger, *Omnibus: Summits and Secrets: The Endless Knot, Spirits of the Air*, p. 347
[548] Email correspondence with Ben Heason, 3rd August 2008, see appendix, p. 256
[549] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 138

about difficult things that fail, are they still pleasurable? Is the intellectual challenge still enough in itself, or are difficult things pleasurable because there is a pleasure gained through visual satisfaction? In order to understand how something that is difficult can be invested with the quality of beauty, how something difficult is not pleasurable will be illustrated.

In mountaineering, there are many dangers that halt the pursuit of climbing a particular line. As Young wrote, 'a guide has a child's fear of two things chiefly: a cloud and a falling stone'.[550] These dangers are very real, and the guide as well as his client has to put safety before all other things. Young continues that 'when the guide of the party ahead of us chose the traditional but, on the day, the more dangerous of two lines, I had to say firmly that I should retreat rather than take the risk'.[551] The traditional line that Young refers to would have been, in a visual sense, the most aesthetically pleasing line. A traditional line generally means those lines that stand out, visually, against the background and these lines are most commonly described as the most aesthetically pleasing lines in a mountain. Contemporary climbers agree that the lines they climb are selected largely due to an aesthetic appreciation; Ben Heason affirms that the lines which attracts his desire to climb them tends 'to be the most striking lines, such as the arêtes and corners, which are continuous lines from bottom to top. They are the purest lines'. These lines, he says; 'just stands out and asks to be climbed. They simply catch the eye more strongly therefore giving you a stronger urge to climb them'.[552]

Martin Moran argues that lines which seem to stand out against the background, for example long, continuous lines from base to summit, arête's, corners or long cracks and geological features are considered to be attractive lines and that these lines would be preferable to lines that were chosen purely out of difficulty.[553] However, although the reference to aesthetics here is referring to a visual kind of pleasure, Moran observes further that this is with the exception of large unclimbed peaks, such as mountains in the Himalayas, where the beauty of a line takes little precedence due to safety. If the natural aesthetic line of such climbs also happens to be the safest then 'such routes gives the best mountaineering experiences imaginable'.[554]

[550] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 130
[551] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 131
[552] Email correspondence with Ben Heason, 3rd August 2008, see appendix, p. 255
[553] Email correspondence with Martin Moran, 19th August 2008, see appendix, p. 253
[554] Email correspondence with Martin Moran, 3rd August 2008, see appendix, p. 253

Young and his team chose to climb the less visually pleasing of the two lines, the traditional line always retaining its visual aesthetic qualities, but the idea of climbing a line where the risks are too high loses its pleasurable appeal. As the author described it, it was a 'freakish alternative line'.[555] Why do climbers feel this desire to climb a line that 'stands out against the background'? Merleau-Ponty explains that we have an innate desire to organise the visual field, that space could either be seen as 'a sort of ether in which all things float',[556] or as a space, which through the act of reflection catches the space at its source and tries to see how things are connected. The gaze favours certain directions and 'our perception would not comprise either outlines, figures, backgrounds or objects, and would consequently not be perception of anything, or indeed exist at all, if the subject of perception were not this gaze which takes a grip upon things'.[557] This experience, he says, is a kind of hold upon the world, and this communication between the subject and the world, which is more ancient than thought, 'saturate[s] consciousness and [is] impenetrable to reflection'.[558]

The world is organised into depth and it is this wish to organise the visual field into depth that draws climbers to certain lines in the mountains. 'The segregation of planes and outlines is', as Merleau-Ponty points out, 'irresistible'[559] and this makes the traditional line that Young described above, the most appealing line. However, this line was ruled out for the summit attempt due to the imminent dangers it presented on that morning. The pleasures, which its visual aesthetic appeal would normally possess, immediately disappears with the risk of an imminent death. In this context, Young illustrates another incident where their

> excellent guides, overawed by the terrific threat of the sections far above us, tried prematurely to prove the whole climb impossible, by taking a fancy line early in the day which obviously led to a hopeless impasse.[560]

The 'fancy line' was chosen, not from the desire to climb it, but in order to prove the climb impossible and motivated, as Young pointed out, by fear. A later paragraph from Young's book explains something important in this respect, and is worth quoting in length:

[555] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 131
[556] Maurice Merleau-Ponty, *Phenomenology of Perception* (London: Routledge, 1992), p. 284
[557] Merleau-Ponty, *Phenomenology of Perception*, p. 295
[558] Merleau-Ponty, *Phenomenology of Perception*, p. 296
[559] Merleau-Ponty, *Phenomenology of Perception*, p. 307
[560] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 133

> It is for our reconnoitring craft, first, to reject those alternatives which are interrupted by the angle of *the impossible*; secondly, to condemn the lines where it detects surface conditions or direct menaces which will introduce *too large an element of danger*; thirdly, to except the routes where it decides that harsh angle and poor condition in unrelenting succession combine to form *too great a volume of difficulty* to be humanly vincible in a single expedition; and lastly, if *no agreeable or interesting remainder* be left over, to use its utmost skill to determine whether some unseen aspect may not reveal sufficient of its character to encourage a hope that it will offer a more helpful line of attack.[561]

In effect, what Young is saying is that the role of reconnoitring is to solve one very large problem, or a succession of problems. When the climber is struck by 'the impossible', with 'danger' and 'difficulty', the role of the climber who surveys the mountain is to determine whether there are some 'unseen' aspects of the mountain that could 'encourage a hope' and offer 'a more helpful line of attack'. It is almost exhausting just to read this paragraph as a whole, not only because it is long, but also because of the sense of impossibility with the situation that Young describes. Ultimately, to have a 'hope' of something means to have an expectation, or a desire, for something – but there is nothing in Young's passage that suggests what this desire was directed at, with the exception that it was something 'unseen'. From this 'unseen aspect' emerges something that lies at the core of mountaineering experience: a desire for something difficult to understand and to test ones ingenuity in solving the difficulty. The 'unseen' suggesting not only something that is not within view but also something that the climber must be able to see, or solve, in the mind. This difficulty that most climbers find themselves in during their pursuits of climbing mountains has been of much interest in literature in the last decade,[562] but the focus has not been on difficulty as a decidedly aesthetic aim.

The climber, in Young's text, experiences a sense of enjoyment in the search for, and possible discovery of, a single opportunity when all others have been exhausted. Young continues that very

> rarely we can say, 'It is impossible;' occasionally we can say, 'It will go for certain;' but generally we have to leave some portion of the 'round the corner' chance.[563]

[561] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 373 [my emphasis]
[562] See, for instance, Thompson, *Unjustifiable Risk: The Story of British Climbing*, Stephen. E. Schmid (ed.), *Climbing – Philosophy for Everyone: Because Its There* (New York: Wiley-Blackwell, 2010) Jeff Connor, *Douglas Haston: The Philosophy of Risk* (Edinburgh: Canongate Books, 2002)
[563] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 385

Is it, then, this prospect of a 'hope' and a 'round the corner' chance that gives climbing some of its aesthetic appeal? Part of what Young describes suggests that much of the pleasure of climbing lies in this element of being in anticipation of something, that overcoming impossible or improbable aspects of the climb 'can well be left to the moment':

> 'If we could map out a whole climb before we did it, much of the pleasure would be lost.'[564]

By their nature, the character of rock contains an element of 'whimsicality' and this is, Young writes, always in the climber's favour.[565] If much of the pleasure is lost by knowing the exact route to the summit, one can draw from this that a climber wants to experience some degree of physical as well as intellectual challenge, and that it is the challenge that is at the core of the climber's pleasure. A route that details all the obstacles, and includes information about whether some sections are possible or not possible to climb, would for the climber lose much of its aesthetic appeal. It is clear that prior knowledge of the problems as well as their predicted solutions makes the climb less intellectually and physically challenging, and because it is the challenge of the unpredictable that plays a main part in the pleasure that the climber seeks, by mapping out a whole climb, the aspect of pleasure contained in the surprise is instantly removed.

Kurt Diemberger, who started climbing in the late 1940's to early 1950's, represents the generation of climbers who would have been inspired by the books of Young and his generation of climbers. Diemberger describes well this moment of surprise that Young illustrated above, the surprise that appeared just when all other hope was lost:

> The corner, the 'groove', might be the key; but after a few steps I could see that our dream of the summit-prize was over. [...] And then, all of a sudden, I spotted it... surely, there, just above the snow-crawl, one small weakness in the ice-armour, and the only one! [...] Yes – just at the most improbable spot – there was a way up [...] that last link in the direttissima.[566]

Whilst Young attempted to theorise on how probabilities formed a key part in a mountaineer's experience of pleasure, Diemberger's description portrays the pleasure

[564] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 388
[565] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 388
[566] Diemberger, *Omnibus: Summits and Secrets: The Endless Knot, Spirits of the Air*, pp. 94-95

in 'chance', something which Young also attempted to reveal. However, what Diemberger's text makes particularly clear is the ways in which climbing is represented as and likened to a puzzle, and the intensity of the pleasure derived from solving it. Diemberger continues that ideally, a true first ascent should be made in one piece, a continuous climb from the bottom to the summit. However, the direttissima[567] of the Königswand could not be completed in a single climb, and he contemplates this last bit (of the puzzle) that was missing, and whether he should return to climb just this last section or the whole climb in its entire length.[568] The direttissima, which was in Diemberger's text associated with extreme difficulties,[569] added to the fact that he was contemplating to return to this particular section in order to climb it in one whole continuous piece confirms our suspicion that difficulty and the urge to solve this puzzle aspect of the climb were indeed the chief motivating factors.

To have a 'problem', which needed solving seems therefore to be a *criterion* for good climbing experience but if, like a puzzle, the mountaineer's criterion for experiencing pleasure requires some element that challenges the mind, there must also be an element of enjoyment in the ability to think logically and to reason as well as in the recognition of patterns. Middendorf similarly asserts: 'I enjoyed the puzzle aspect of piecing together discontinuous features in order to climb with the least permanent impact'.[570] But what does this enjoyment involve? If climbing is reminiscent of a puzzle, we need to look at the kinds of pleasures that 'the puzzle aspect' creates in climbing. A puzzle demands of the person attempting to solve it, a degree of ingenuity, or a desire to solve difficult problems and meet with challenges. A puzzle is first and foremost an intellectual challenge, which the climber enjoys, because although climbing is at its heart a physical challenge, the 'piecing together [of] discontinuous features' must first be resolved as an intellectual problem. Delorme, who was concerned with the intellect and also with the possibility of proving his intellectual capacity, actively sought out these challenges and the more difficult the puzzle was, the more pleasure it would have. His trompe at Anet being a good example of a sense of pleasure derived from 'the puzzle aspect' of his designs.

Although what Middendorf and Delorme share is a quest to solve spatial puzzles and difficult problems, it is important to ask whether they seek these

[567] Diemberger here associates the direttissima with 'extreme difficulties'.
[568] Diemberger, *Omnibus: Summits and Secrets: The Endless Knot, Spirits of the Air*, p. 96
[569] Although it must be noted that this is not always the case with direttissima's
[570] Email correspondence with John Middendorf, 21 September 2008, see appendix, p. 254

intellectual challenges for their own sake? A rationalist, for example, would have had the intellectual pursuit as the sole motivating factor that drove their quest for such challenges, whereas it would seem that for both disciplines discussed here the challenge is primarily physical. Climbing and building are after all both practical pursuits and they have these practical, and material, challenges at the centre of their activities and discourse. Can it then be argued that both disciplines' attraction to difficult lines share a kind of rationalist account of beauty? Does the puzzle once solved continue to have its intellectual appeal, like rationalist challenges that have the intellectual challenge as its sole attraction? What trompes and climbs have in common, is that once a spatial problem, or puzzle, has been solved, they become easier to understand and to resolve in the mind and other more difficult ones becomes easier and more within mental reach.

Unlike ordinary puzzles, where once the problem is solved there is nothing more to contemplate, with examples such as trompes and climbs however there is no end to the challenge because there are always more complex puzzles or spatial problems to solve. Once you have tackled a grade 5a climb, you tackle a 5b, then a 5c and so on and so forth, and once a simple trompe has been created, a more difficult one is attempted. MacLeod, one of the worlds leading contemporary rock climbers, recently (2006) reached the limit of existing climbing grades with his climb at Dumbarton Rocks, Scotland, called *Rhapsody* and graded E11 7a. MacLeod comments:

> Notes on the grade: E11 7a. Obviously this is a remarkable grade. It arises mainly from the physical and technical difficulty of the climb. It's *the hardest link* I've ever done [...] But it's also very technical climbing, a very devious sequence.[571]

Thus, each time MacLeod attempts a harder climb, his spatial puzzles becomes increasingly less likely to be solved and places a new grade on the climbing scale. As he says about one of his earlier attempts at this climb: 'my worst fear was realised and the rope wrapped itself around my leg as I fell, flipping me upside down, crushing and burning my leg and slamming my back off the wall. I just managed to pull my head out the way, If I hadn't I would be dead.'[572]

[571] Dave MacLeod <http://www.ukclimbing.com/articles/page.php?id=198.> [accessed 10 July 2009]
[572] Dave MacLeod <https://www.scottishclimbs.com/wiki/Rhapsody_E11_7a> [accessed 06 Sept 2012]

41 Dave MacLeod climbing the E11 Rhapsody at Dumbarton rock

MacLeod, like Diemberger, also uses the term 'link' in describing the climb, again drawing a connection between a climb and a puzzle. In Delorme's time, his trompe at Anet would have represented a spatial puzzle as difficult as MacLeod's climb which he graded E11 7a. A climb at this scale did not exist prior to his successful climb of this route in 2006 and throughout the history of climbing there was a quest to reach the limit of human capacity. 'Time perhaps will show,' Clinton Dent observes, and all 'that need be here pointed out is that the upward limit has assuredly not yet been reached'.[573] Just as Dent predicted, increasingly more difficult climbs began to appear, and the 'upward limit' is still as ambiguous today as it was then, as MacLeod's *Rhapsody* shows. Diemberger also wrote about this drive to climb more and more difficult routes: 'once the day dawned when to climb a peak by the normal route [...] failed to satisfy' he writes, 'I had become a rock-climber [...]. Rock – with all the difficulties of extreme climbing – that was the thing: cliffs, ridges, arêtes of rock.'[574] The challenge of these puzzles, then, is never ending.

Scruton here says something that may be of help in understanding what the relationship between the challenge of solving a difficult problem and its aesthetic appreciation is. There is a 'mistaken idea that one can somehow judge the beauty of a thing in abstracto, without knowing what kind of a thing it is',[575] he writes. What function, then, do a mountaineer's line and an architect's design have? One might

[573] Dent, *Mountaineering*, p. 89
[574] Diemberger, *Omnibus: Summits and Secrets: The Endless Knot, Spirits of the Air,* p. 62
[575] Scruton, *The Aesthetics of Architecture*, p. 9

assume that the objects discussed in this chapter and their aesthetic appreciation has nothing at all to do with their function. However, if we consider Delorme's trompe at Anet, for example, what was its main purpose? We know that Delorme had been given the task of designing a cabinet for the king and that the trompe's primary function was to support this overhanging cabinet, but it is clear from Delorme's text that his interest and appreciation of the trompe is not simply due to fulfilling this function. For him, the trompe at Anet must possess evidence of being the most difficult of designs thus proving the ingenuity of the architect. Like the climbers, the architect had a continuous quest to reach an 'upward limit' of his intellectual capacity, and to prove this to his contemporaries.

Indeed, Delorme seemed to have built the trompe at Anet solely in order to prove his own ingenuity and that he was able to construct something at this level of complexity and difficulty. This, then, was the trompe's main function: to hang on the wall as the evidence of a complex spatial and engineering problem once solved. It is this act of intelligence necessary to solve the problem of the trompe as a spatial riddle that becomes one of its primary functions, and this was the object of Delorme's own aesthetic appreciation of the object. However, many writers on Delorme did not share this appreciation in more recent times. Charles Moore, for example, described Delorme in 1905 as 'a man with little artistic genius,'[576] furthermore that his building was as an 'architectural monstrosity'[577]. According to Moore, the Chateau at Anet 'shows the same lack of a fine artistic sense'[578] and most significantly he stated that his trompe was 'a crazy composition' with 'foolishly deformed members'.[579] Clearly, what Delorme saw as aesthetically pleasing was very different to what Moore, and other architects of the late nineteenth and early twentieth century, thought were pleasing.

Accordingly, it could be said that Delorme inscribed a sort of rationalist idea of aesthetics into his designs, an idea that by the early eighteenth century had achieved dominance. The idea behind the rationalist view was that the beauty of an object arises from a conception of the object in thought, that we judge something as being beautiful 'by reasoning it out'.[580] The analogy is true of mathematicians, for example,

[576] Charles Herbert Moore, 'Lescot and de l'Orme' in *Character of Renaissance Architecture* (New York: Macmillan, 1905), p. 200
[577] Moore, 'Lescot and de l'Orme', p. 206
[578] Moore. 'Lescot and de l'Orme', p. 207
[579] Moore, 'Lescot and de l'Orme', p. 209
[580] Shelley, James, "The Concept of the Aesthetic", The Stanford Encyclopedia of Philosophy (Spring 2012 Edition), Edward N. Zalta (ed.), <http://plato.stanford.edu/archives/spr2012/entries/aesthetic-concept/> [accessed 22 May 2012]

who says that 'Mathematics are marvellous!'[581], but mathematics cannot be said to be any more or less marvellous than Delorme's trompe unless one understands the problem as well as the ways to go about solving it since its aesthetic appreciation is a result of a conception of the problem. Delorme's aesthetic judgement thus depended upon an understanding of the object and this was one of the functions that the object fulfils. Delorme's example consequently draws a direct link with his readings of the origins of the rationalist thesis in Plato and Aristotle, and their perception of art as an exercise of reason. However, Delorme's philosophy took several steps further and also involved creativity, innovation and personal expression, something the ancient rational concepts of beauty had little room for.[582]

Having looked at architecture in this way, we must now ask what function a climb has in this connection? Unlike Delorme's trompe, the climb would not fulfil any practical function at all, thus mountaineering facing 'the perennial question: why do people climb?'[583] James Morris, reporting for *The Times*, wrote after the 1953 Everest expedition that 'pride; ambition; aestheticism; mysticism and masochism' were the five main motives to pursue such a climbing expedition.[584] It is something that never fails to appear in the literature, neither in the climbing text nor in the stonecutting text. Ben Heason, in this context, explains that the attraction of climbing the most difficult part of a cliff is essentially the pride of having climbed it, a sense of accomplishment and mastery:

> The attraction of climbing a direttissima[585] is that you can be proud that you have climbed the hardest section of that cliff.

Young described this feeling in another way: 'a Napoleonic attitude with outstretched arms appeared in silhouette'[586] – the pride of which belonged not even to a person, but to an 'attitude'. However, although to climb something difficult would ordinarily be associated with pride, ambition and masochism, the challenge is closely related to the notion of what the aesthetic appreciation of the climb was.

[581] Diemberger, *Omnibus: Summits and Secrets: The Endless Knot, Spirits of the Air*, p. 177
[582] See Oswald Hanfling (ed.), *Philosophical Aesthetics. An Introduction* (Blackwell in association with the Open University, 1992), p. 6
[583] Thompson, *Unjustifiable Risk? The Story of British Climbing*, p. 323
[584] Thompson, *Unjustifiable Risk? The Story of British Climbing*, p. 323
[585] Heason here associates the direttissima with being the most difficult section of a climb, although this may not always be the case with these types of climbs.
[586] Young, *Mountain Craft*, Charles Scribner's & Sons, p. 133

Unhomely pleasures

Having considered the possibility of how something of a difficult nature, intellectually and physically, gives aesthetic pleasure to the climber and the architect, another aesthetic pleasure that the two practitioners share, and that are equally interesting in their capacity to arouse pleasure, is the unhomely. This part will focus on the capacity for the unhomely to arouse the imagination in such a way that this, otherwise non-pleasurable, experience evokes aesthetic pleasure. This pleasure, torn between its antitheses, is a powerful one and draws people to seek these experiences persistently and repeatedly. Although this enquiry necessarily must involve questions around why climbers are attracted to such spaces, it will not be as much concerned with why they are drawn to these experiences, as with the fact that they are, and in what way they do so. More importantly it will draw out how the attraction to unhomely spaces is a deep and powerful experience important for the discipline's understanding of what 'home' is, and thus also how it is an important factor in their ability to develop a sense of mastery of the two spaces.

According to Young 'a cloud and a falling stone' were the two main things that mountain guides would be frightened of, and also the two most significant dangers of a high altitude climb. Kurt Diemberger describes an episode on the ascent of Chogolisa, a mountain rising 7653 meters in the Karakorum:

> Without any warning, all hell broke loose. Grey veils of mist scurried across the ridge. Unnatural darkness swamped us. We fought our way forward through clouds of blown snow, bending double to meet the fury of the gale. On the crest of the ridge it flung itself upon us in full blast, snatching at our clothes, trying to claw us from our footing. [...] It didn't seem possible. I thought of the blue sky such a short time back. It had all been so quick. I had an uncanny feeling [...].[587]

A sudden change in the weather is a common and potentially very dangerous occurrence in the mountains, and there is nothing pleasurable about the experience in Diemberger's description. All 'hell broke loose', 'grey veils of mist scurried across the ridge' and the darkness appeared 'unnatural'; indeed one gets the sense that death has arrived, suddenly and without notice. What, then, do climbers learn from such experiences? And, in what way can there be anything pleasurable to be found in them? How does it relate to a climber's sense of mastery of this space?

[587] Diemberger, *Omnibus: Summits and Secrets: The Endless Knot, Spirits of the Air*, pp. 125-126

In a later chapter about the North Face of the Eiger, Diemberger asks himself why he, and others, climb mountains: 'Why do we do such things?' he asks, 'Because we enjoy them? Standing at the foot of the Eiger's North Face', he says, 'I very much doubted it.' He goes on to describe the Face:

> A huge, dark triangle rises sheer above the meadows of Alpiglen. There is no life in it, only cold rock. A monstrous slab composed of stone; of grey, riven ice-fields, of crumbling bastions... a labyrinth of glassy runnels and ice-encrusted niches between polished steps of rock, rising vertical – like storeys of a house set one on top of another – right up into the clouds.[588]

If the space of the Eiger's North Face, then, is 'dark', 'cold', lifeless, 'monstrous', 'riven', a sort of crumbling labyrinth, can there be anything pleasurable about climbing, or the thought of climbing, such a space? The Eiger's North Face, Diemberger writes, is large enough to accommodate a city and yet a city 'is an expression of man's life and activity. The Eiger was not made for human-beings.'[589]

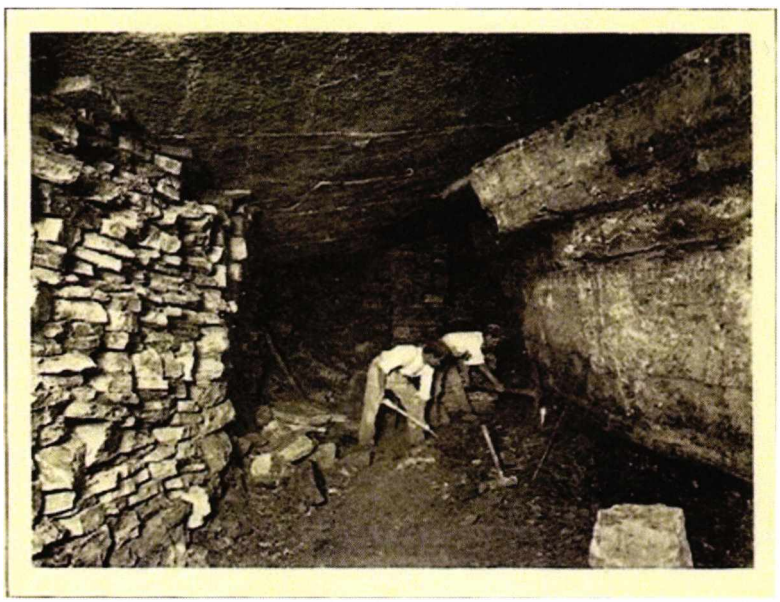
Despite this, he continues, men came to this space and imported concepts of life and death, which until then, it had transcended.[590] These men

> sought to penetrate that inhuman dimension of the North Face, by trying to climb it... It is an unnatural, outsize dimension, beyond human ken. It is also a dimension whose secret no one can resist.[591]

Even under these conditions, in this inhuman and uninhabitable space, there is something the climber cannot resist, and which Diemberger says defies all description.[592] The temptation to climb such a dark and formidable environment must provide something significantly pleasurable in order to cause such a powerful enticement, because no one (no climber at least) can resist it. Diemberger's passage, which contains significant connections to the human being as someone who dwells in 'a house', compares the 'monstrous slabs' of stone with 'storeys of a house', and some clues to the climber's enticement lies within the connections the author makes between something homely and something significantly unhomely. The 'dark triangle', which he describes, has 'no life in it', and yet the idea of 'house' and 'city' penetrates his text. If what the climber seeks is a sense of mastery of space, it could be suggested that this splitting of the two ideas of what space and home is, influences their ability to do so.

[588] Diemberger, *Omnibus: Summits and Secrets: The Endless Knot, Spirits of the Air*, p. 134
[589] Diemberger, *Omnibus: Summits and Secrets: The Endless Knot, Spirits of the Air*, p. 134
[590] Diemberger, *Omnibus: Summits and Secrets: The Endless Knot, Spirits of the Air*, p. 135
[591] Diemberger, *Omnibus: Summits and Secrets: The Endless Knot, Spirits of the Air*, p. 135
[592] Diemberger, *Omnibus: Summits and Secrets: The Endless Knot, Spirits of the Air*, pp. 134-135

There are several answers to the aesthetic pleasures found in these experiences. One answer may lie within, as Diemberger seems to suggest, our quest to understand this outsized, unnatural dimension that is 'beyond human ken'. The desire to climb such a space has a direct link with the quest to broaden our understanding about things because 'an enrichment of the understanding' is a significant feature of aesthetic experience, and it has a deep cognitive significance.[593] But how can this aesthetic pleasure, of enriching our understanding, have such significance that climbers risk their lives for it? There must be something more to it. An answer may be found in what it is an understanding of, and questions about what it means to be human and what it means to dwell, which are significant questions to the purpose and meaning of life. These may be the kinds of questions that are powerful enough to be able to drive these kinds of activities.



42 Purbeck Shop

In the accounts by stoneworkers in the quarries, there is a similar type of enticement about a space not ordinarily meant for human beings. Not on top of the world, this time, but in the bowels of the earth. 'Men will take risks underground that

[593] Jonathan Friday, *Aesthetics and Photography* (Aldershot; Burlington, VT: Ashgate, c2002), p. 23

they would not think of for a moment in the cold light of day',[594] Eric Benfield writes, and yet

> men who have been trapped until found will go back to work under the same conditions – once it has been experienced there is something in working alone in the bowels of the earth which will make a man return to it. Nowhere else can be found the same sense of being completely alone. [...] No night is ever as dark and still as a quarry.[595]

What seems to entice and draw the stoneworker back to 'the bowels of the earth', as he calls it, is first of all the sense of being alone, and second, as he continues further on, that underground there is 'a complete freedom from any contact of sound or sight'.[596] What Benfield describes is remarkably like the descriptions found in the mountaineering literature. The experiences are repeated: of exposure to the elements, of seeing a space that no other man has seen before, the discovery of a new part of the world, the sense of solitude, and of freedom from (manmade) sights and sounds. There is a dichotomy between life and death, between the human and the inhuman and most importantly; there is a distinct difference between the habitable and the uninhabitable:

> I always found something of a thrill the first time I stepped, crawled or wriggled behind a block of stone which had just been moved out of place. [...] a new bit of the world can be seen, somewhere, at least, where no other man has been.[597]

This sense of space that both Diemberger and Benfield portrays is interesting because a discourse on the unhomely[598] has not focused on the ways in which it, as an aesthetic experience, has any connection to how the disciplines develop a sense of mastery of their spaces. There is a sense of pleasure in the protection that a house can provide, and we imagine that anyone engaged with a house either through designing, building, or dwelling will daydream about a house or a home in a particular way and to seek this pleasure that they provide. However, when Bachelard writes that the house becomes more intimate 'when it is besieged by winter',[599] what he is really saying is that the understanding of what a house means is intensified by the snow outside. In Bachelard's philosophy, this type of pleasure is something sought in daydreams and in the imagination and these dreamers, he says, 'ask the sky to send down as much snow,

[594] Benfield, *Purbeck Shop: A Stoneworker's Story of Stone*, p. 66
[595] Benfield, *Purbeck Shop: A Stoneworker's Story of Stone*, p. 69
[596] Benfield, *Purbeck Shop: A Stoneworker's Story of Stone*, p. 72
[597] Benfield, *Purbeck Shop: A Stoneworker's Story of Stone*, p. 22
[598] Architectural discourse has tended mostly to draw upon Heidegger, Bachelard and Vidler in this respect.
[599] Gaston Bachelard, *The Poetics of Space* (Boston: Beacon Press, 1994), p. 38

hail and frost as it can contain'. However, Bachelard's dreamers dream about the outside from the inside, unlike the two practitioners discussed above, but what they share is the way in which they contrast the outside with the inside, the homely with the unhomely.

Climbers, like Diemberger, for example, daydream about a space outside, but he has no inside from which to observe it should 'all hell' break loose. Not unless he is at base-camp or in a camp closer to the summit, and even then, with only a millimetre of tent fabric between the 'hell' outside and the relative comfort of the inside of their tent:

> The gale screamed around the rocks and jammed every cranny with ice. We sat under the bivouac-sack and sang, almost all through the night, with breaks for brewing tea.[600]

Nevertheless, the 'bivouac-sack' in Diemberger's text provides a sense of protection and shelter; and the gale increases the shelter's value in the climber's imagination. There is a strong sense of something homely in Diemberger description of what happens inside the bivouac-sack. Despite the gale that screamed and crammed every cranny of the bivouac-sack with ice, inside the bivouac-sack, the climbers continued singing and brewing tea all through the night. Singing and brewing tea are generally activities that are associated with togetherness and homeliness, and in this extreme polarity between the homely and the unhomely, between the inside and outside, the sense of these homely pleasures is experienced with an increased intensity.[601]

After climbing the North Face of the Eiger, and upon return to the valley and to the hut, Diemberger describes with intense enjoyment those homely surroundings: 'How wonderful it was [...] to be lying in a newly-made bed, to be alive, and to be able to enjoy life – this wonderful life of ours',[602] he writes. Being exposed to extreme weather, without the protection of the home and homely comforts increased the climber's value in homely pleasures, and as it comes across in the descriptions, it is a very powerful experience. Bachelard explains this dialectic well through a metaphor of the manor house and the cottage. He refers to Saint-Pol Roux, the lord of a manor house, who nevertheless chose to live a peasant's life and who writes that 'the original reason for the manor house was, through antithesis, to enable me to really see the

[600] Diemberger, *Omnibus: Summits and Secrets: The Endless Knot, Spirits of the Air*, p. 158
[601] Bachelard, *The Poetics of Space*, p. 40
[602] Diemberger, *Omnibus: Summits and Secrets: The Endless Knot, Spirits of the Air*, p. 158

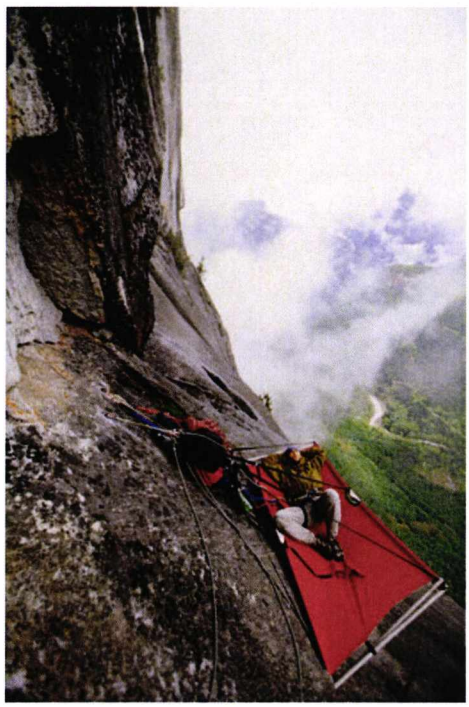
cottage'.[603] Bachelard's use of the phrase 'to enable me to really see' is a strong indication of what such experiences also means to climbers and architects. If *understanding* is such a powerful drive, and if we are to agree with Bachelard, experiencing the antithesis of what one tries to understand becomes a significant factor. Thus, he says, we have a 'need for retreat and expansion, for simplicity and magnificence'.[604]

This dialectic is extreme in the mountaineer's experience, and although we have seen that one of the pleasures mountaineers get from climbing is that it enables them to better enjoy their everyday lives and homes, what is more important for the discussion here is the way in which it teaches them what space really is. There is a passage in Diemberger's text where we see the differences between the two clearly. During an uncomfortable bivouac on the face of the Eiger, his climbing partner has a dream that he prepares to walk out onto level ground[605] and this physical comfort that he sought in the dream, is regained once the climb is completed:

> we got to the bottom at last and – remembering Wolfi's dream at the bivouac on the face – found ourselves going out 'to where it was level'.[606]

Once again, Diemberger describes all those ordinary pleasures of daily life, and of horizontal life.[607] The horizontality of space is opposed to its verticality, and the spatial qualities are deeply felt. John Long writes, for example, that nearing the top of El Capitan in the Yosemite Valley, 'the exposure is so enormous, and your perspective so distorted, that the horizontal world becomes incomprehensible.'[608] He continues that when reaching the top those 'first few moments on horizontal ground are so disorientating they hurl you into a transitional spin'.[609] To gain a true comprehension of space and spatial qualities, it seems, these kinds of 'unhomely' experiences are indeed necessary.

[603] Bachelard, *The Poetics of Space*, p. 65
[604] Bachelard, *The Poetics of Space*, p. 65
[605] Diemberger, *Omnibus: Summits and Secrets: The Endless Knot, Spirits of the Air*, pp. 153-154
[606] Diemberger, *Omnibus: Summits and Secrets: The Endless Knot, Spirits of the Air*, p. 158
[607] Bachelard, *The Poetics of Space*, p. 184
[608] John Long, John Middendorf, *Big Walls*. (USA: Falcon Publishing Inc., 1994), p. 6
[609] Long, *Big Walls*, p. 7



43 Climber relaxing in a portaledge.
Image by © Aaron Black/Solus-Veer/Corbis

Distortion, the 'incomprehensible', 'disorientation' – are all terms that reflect the problem with space that both disciplines attempts to master. Since the end of the eighteenth century, architecture has been associated with concept of the uncanny and the best-known account of this in architectural discourse is found in Anthony Vidler's book on the subject. He discusses what he calls the spatially uncanny: 'the peculiarly unstable nature of house and home',[610] and to borrow Vidler's words, there is something 'peculiarly *unstable*' about the activities of building and climbing. Akin to Delorme's trompe at Anet which appears to defy gravity in a seemingly imminent danger of falling down, the mountaineer's home during a night on a mountain is a portaledge suspended on the rock wall (figure 43). The notion of the unstable not only forms the basis for their existence, but it also holds the key, as it were, to the difficulty in comprehending space. It was for the climber as it was for the architect the most challenging of problems: how to solve a problem by attempting to defy the nature of the problem itself. The climber defies gravity as he makes his way up the mountain; it is his motive for climbing it, to conquer the verticality of space, to master space.

[610] Vidler, *The Architectural Uncanny*, p. viiii (p. 1)

Vidler's account of the spatially uncanny traces this concept from Friedrich Schelling to Sigmund Freud, and he uses Freud in particular as a point of departure for discussions around contemporary architectural and urban projects.[611] Freud's concept of the *unheimlich*, as he says, 'demonstrat[es] a disquiet slippage between what seems homely and what is definitely unhomely.'[612] Freud's *unheimlich*, which is rooted in 'the environment of the domestic' grapples with a spatiality that 'touches all aspects of social life',[613] is therefore the ultimate source of Vidler's quest to analyse what he calls 'the architectural uncanny', the title of his book. The book deals with the relationship between 'the psyche and dwelling, the body and the house, the individual and the metropolis'.[614] It discusses thus on one level the house and home and on another level the larger spaces of the modern city and how its labyrinthine spaces effects modern anxiety. Transferring this concept into the mountains, we saw for example that Diemberger indeed also used the term 'labyrinthine' in his description of the North Face of the Eiger, and that 'no one can resist' it despite this frightening prospect.[615] We have seen, then, how these unhomely qualities of space, through a desire to solve problems and to *know*, are turned into strangely pleasurable experiences which enhances the participants understanding, and sense of mastery of space. The vertical is, of course, only one of many qualities.

Another quality of space, which is equally difficult to comprehend, is depth, dimension and distance. And as Bachelard argues, 'immensity' - a pleasure found in daydreaming - is 'an inner state that is so unlike any other, that the daydream transports the dreamer outside the immediate world to a world that bears the mark of infinity'.[616] This state of mind, this intimate immensity, is an immensity that we find within ourselves; it is 'the movement of motionless man'.[617] Bachelard's idea of immensity correlates very little with geographical realities, but in building and climbing these kinds of daydreams about the spatial quality of distance and depth are given a more direct way to comprehend such qualities. When Diemberger reached the summit of Broad Peak and seeing the geographical immensity of the distances, he

[611] The discussions in the book also dealt with nineteenth and twentieth century authors of uncanny tales, such as Freud's favourite; E. T. A. Hoffmann, as we saw in chapter two, pp. 89-90
[612] Vidler, *The Architectural Uncanny*, pp. unpaginated-x
[613] Vidler, *The Architectural Uncanny*, p. x
[614] Vidler, *The Architectural Uncanny*, p. x
[615] Diemberger, *Omnibus: Summits and Secrets: The Endless Knot, Spirits of the Air*, p. 135
[616] Bachelard, *The Poetics of Space*, p. 183
[617] Bachelard, *The Poetics of Space*, p. 184

faced this latter type of daydreaming, and for him the immensities of both interior and exterior geographies meet:

> That cornice in front of me annoyed me. If one could look out over it without hindrance, it would feel just like looking down out of the sky; a unique sensation, to be up above everything, with nothing but air and empty, infinite space round and about. [...] Finally I stood clear, with nothing between me and the view, nothing but thin air all round me. I gazed eastwards for a long time over those extraordinary depths, far into the unknown, which must be Tibet. An unbounded loneliness lay on that landscape. There was something incomprehensible about it [...].[618]

When the daydreams are in natural surroundings and not in houses of the past, Bachelard suggests, it is 'original contemplation', the daydream 'flees the object nearby' and is 'in the space of elsewhere'.[619] It is this type of imagination that art-works are the by-products of, he argues, and explains that the real product in this situation is a 'consciousness of enlargement'; something that confirms the argument in this chapter that one of the forces behind the activity of climbers is driven by a desire to know. In Diemberger's example, there is something he is seeking in climbing out on the cornice, in order to see the undisturbed view, a desire to understand this spatial quality by a direct experience of it. This extraordinary depth, and the unbounded loneliness of the landscape, he writes, is incomprehensible. The infinite physical space encourages an enlarged consciousness that also points to an intimate and, to use Bachelard's apprehensive use of the term, psychological depths.[620]

Geographical dimensions, Bachelard writes, are rooted in particular oneiric values,[621] and the dimensions that are repeated in Diemberger and Benfield's texts indicate a similar kind of value in the two different spaces. Diemberger writes about the silence and distance of the mountain:

> Now was the moment of ineffable truth – the silence of space around us, ourselves silent. This was utter fulfilment. The sun went trembling to the horizon. Down there was the night, and under it the world. Only up here, and for us, was there light. [...] As I looked out, an enormous pyramid of darkness projected itself over the limitless wastes of Tibet, to lose itself in the haze of impalpable distance – the shadow of Broad Peak.[622]

[618] Diemberger, *Omnibus: Summits and Secrets: The Endless Knot, Spirits of the Air*, pp. 116-117
[619] Bachelard, *The Poetics of Space*, p. 184
[620] Bachelard, *The Poetics of Space*, p. 185
[621] Bachelard, *The Poetics of Space*, pp. 186-187
[622] Diemberger, *Omnibus: Summits and Secrets: The Endless Knot, Spirits of the Air*, p. 119

Vast distances combined with the experience of silence, as we saw in Benfield's description of the stoneworker's experience in the quarry, is a pleasure that both stoneworkers and mountaineers seek. However, Diemberger writes that a sense of pleasure in the experience appears only once his climbing partner joins him. Before this, he writes: 'I suddenly felt terribly lonely…'[623] and an 'unbounded loneliness' of the landscape we saw in the previous passage followed, and he confesses that the picture he had held of the summit in his imagination, had outshone it by far, that it had been utter disappointment.[624]

As Bachelard alluded to, there is a significant connection between an interior and exterior landscape, something which Diemberger's passage portrays well. Later, when his climbing partner Herman Bull had joined him, Diemberger experiences being at the summit together. No longer do the darkness and the night in the landscape in front of him have the 'unbounded loneliness'. The light he now describes was beautiful, and the last rays of sun rested only on the summit, and on them: 'Down on the horizon a narrow strip of sunlight flickered – a beam of light reached out above and across the darkness towards us, just caressing the last few feet of our summit. We looked down at the snow underfoot, and to our amazement it seemed to be aglow. Then the light went out.'[625] Even the darkness that followed had none of the danger or fear ordinarily attached to it, for in climbing the idea of climbing in darkness is a treacherous one. For Diemberger, it seemed to matter less after his experience of the summit this second time, with Bull. It seems fitting to end here with Diemberger's experience, because in the midst of these unhomely pleasures and that of learning to *know* space and spatial qualities, what Diemberger describes is something that is often forgotten in architecture as is particularly evident in architectural drawings; the absence of the human figure. Its absence may suggest something which architecture lacks in order to get space right.

[623] Diemberger, *Omnibus: Summits and Secrets: The Endless Knot, Spirits of the Air*, p. 116
[624] Diemberger, *Omnibus: Summits and Secrets: The Endless Knot, Spirits of the Air*, p. 117
[625] Diemberger, *Omnibus: Summits and Secrets: The Endless Knot, Spirits of the Air*, p. 119

Conclusion

Aesthetic sense, Scruton argues, has to do with feeling or wanting, it is where theory and practice merges in an area of means. It is not just about a means to an end, but also about how someone achieves an understanding of the end of his activity.[626] Although there is a more dominant focus upon climbing in this chapter, it is done so on purpose because I believe that climbers may hold the key to what space *is* and how to solve the perpetual problems with space that occurs in architecture today. We have seen that architects like Delorme, as well as Dent and Young and other climbers throughout history have actively sought out 'the difficult' and the 'unhomely', and that the motivation from which these difficult pleasures were sought by a deeply human quest to understand: to *know*, and that seeking and attempting to solve the problems of space, are just one part of in this human condition. These aesthetic experiences thus form one part in what Scruton earlier called a 'practical understanding' of space.

Contemporary architectural theory has discussed this in terms of the concept of the human 'need', but Scruton argues that the outcome is both impoverished and absurd.[627] In order to get more satisfactory designs, he says, we must study closer what it is we want and what is missing, he says, is a more complete picture of what the problem is.[628] Scruton suggests that with an aesthetic understanding of space, a better solution to the architectural problem may be found. If, as in climbing, aesthetics holds the position in the climber's experience then the activity of climbing may hold some solutions to the problem of space in architecture, and an inquiry into which we must pursue if we are to understand how to improve architecture and the architectural experience. If an aesthetic understanding of space, then, involves pleasure derived from cognitive processes as well as through bodily experiences, and aesthetics is an integral part of the ways in which a sense of mastery of space is developed, then a further study of the aesthetic of cognitive processes as well as the bodily pleasures which this chapter had to exclude for the lack of space, must get more attention in future theories of space.

[626] Scruton, *The Aesthetics of Architecture*, p. 30
[627] Scruton, *The Aesthetics of Architecture*, p. 31
[628] Scruton, *The Aesthetics of Architecture*, p. 32

Conclusion

> Though there's doorway behind thee and window before
> Go straight at the wall.[629]

In 1899, Geoffrey Winthrop Young anonymously published a small volume called *The Roof-Climber's Guide to Trinity*, effectively an instruction manual with route descriptions of climbs on the buildings of Trinity College, Cambridge. In order to draw together what in this thesis began as a metaphorical traverse between mountains and buildings, between climbers and builders, it seems fitting to end the discussion with a brief look at a practice that, literally, crosses from one discipline to the other. This will allow the weaving of (hi)stories, about how two disciplines during their emergence as professional practices identified and developed techniques that formed the basis for their ability to solve and thus master exceptionally difficult spatial problems, to come to a natural end. Although the chapters in this thesis are neither situated firmly in time nor in space, and have distinctly different disciplines and historical periods at their heart, it was the question about mastering space, the material stone and the craftsman's activities that brought the arguments together into a coherent whole.

The Roof-Climber's Guide to Trinity, although written as 'a parody of the pompous, mandarin, academic style of the early Alpine climbing guides',[630] nevertheless situates the two disciplines in this thesis to a specific time and to a specific place - and perhaps more importantly, it makes a kind of transmutation from the two disciplines into just the one. Instead of mountains, it is here buildings that are at the

[629] Robert Browning quoted in Geoffrey Winthrop Young, John Hurst, Richard Williams. *The Roof-Climber's Guide to Trinity, Omnibus Edition* (Cambridge: Oleander Press, 2011), p. 160
[630] Alan Hankinson, *Geoffrey Winthrop Young: Poet, Mountaineer, Educator* (London: Hodder and Stoughton, 1995), p. 39

centre of the climber's practice. However, 'buildering' or urban climbing as this practice is also called, is in most circumstances an illegal practice – and it was no coincidence that Young's booklet was published anonymously. As Alan Hankinson writes in his biography of Young: 'It had to be done at night because such activity was frowned upon by the authorities as possibly dangerous to the students and destructive to the aging fabric of their buildings. It also had to be done quietly for the same reason [...].'[631] In 1901, the college authorities consequently declared the sport illegal.[632] As seen in this thesis, the stone-workers who worked in the bowels of the earth – also worked in the dark, as did the mountaineers who, before dawn, would have to leave camp for a summit attempt on their mountain. However, although mountaineering was dangerous, as indeed could the practice of building be, both disciplines achieved status as respected crafts – something which buildering has never attained. Alex Hartley's relatively recent book *LA Climbs: Alternative Uses For Architecture,*[633] which proposes climbing routes on a number of buildings in Los Angeles, was for these reasons an entirely fictional account. Alain Robert, the best known climber of buildings, otherwise known simply as The Human Spider, has been arrested a number of times whilst climbing the world's tallest buildings.[634]

The underlying question throughout this thesis was what spatial mastery was, and through an examination of two disciplines, what kinds of techniques they made use of and which of these techniques made their way into the manuals of their crafts, and which did not. As we saw in the previous chapters I have identified six main areas that were clearly visible in the literature written by the two disciplines, both in the narrative descriptions as well as the technique manuals, areas where a sense of mastery was sought – a technical repertoire. Accordingly, each of these techniques were explored in the respective chapters in this thesis. Since the historical gaps between the two were consistently too large, the text was not ordered in any way chronologically, instead it was structured according to the conceptual framework that created a pattern of weaving several texts together, flowing from one discipline to the other, often seeing one practice through the eyes of the other. Necessarily this methodology has indeed also left large voids within the text, because by reading one discipline through another it is then, a story, but indeed not a linear story, that I have attempted to tell.

631 Hankinson, *Geoffrey Winthrop Young: Poet, Mountaineer, Educator,* p. 37
632 Hankinson, *Geoffrey Winthrop Young: Poet, Mountaineer, Educator,* p. 38
633 Alex Hartley, *LA Climbs: Alternative Uses for Architecture* (London: Black Dog, 2003)
634 See Alain Robert, *With Bare Hands. The Story of the Human Spider* (Dunboyne, Co. Meath: Maverick House, 2008)

The first chapter, on *theory*, introduced us to the methodology that lay behind this whole project: that of weaving one discipline and historical period with another, and that this weaving formed the tapestry, as it were, of one subject matter; mastery. As one of the first and most distinguishable steps towards developing their sense of mastery of space, we saw how the two crafts focused upon the ways in which they, during their emergence as professional practices, formed bodies of rules, principles and techniques - theories of their crafts that were systematised into comprehensive instruction manuals. This systematic approach to understanding the principles of their techniques took time to develop and we saw, for example, how such a system progressively developed over the course of nearly a century of published mountaineering literature. I have argued that the birth of written theory was a result of a quest to establish what, more precisely, gave them their distinctiveness and uniqueness as individual disciplines. With the formation of the instruction manual, the role of the master thus changed to becoming an intellectual and erudite craftsman, as opposed to the not so scholarly amateur. The idea that spatial mastery as the result of an intellectual and theorised endeavour was emphasised by both disciplines.

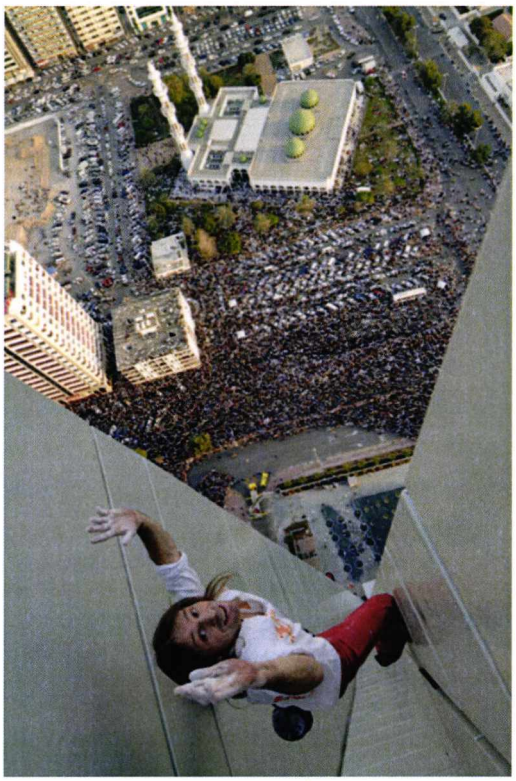
Although written theories brought with it better formed identities and new techniques as a result of such a systematic study of their disciplines, chapter two, on *practice*, demonstrated the extent to which practice or the practical nevertheless prevailed as a technique that was recognised as being a more important way to learn than through theory as a quest to master a craft. Throughout the chapter we saw how both disciplines referred back to practical experience as the only way to truly understand how techniques which were described in theory, would apply in practice. It showed that, essentially, the theories which we saw developing in the previous chapter were almost always less important for their sense of mastery than direct practical experiences which involved both body and eye. The two disciplines shared a desire to 'measure' space and this measure took the form of both corporally felt, as well as seen, knowledge - thus my use of the terms 'practical' in combination with 'geometry'. We saw that the role of an instrument to measure space changed from the scientific instruments reminiscent of earlier travels to relying solely upon body and eye as authentic instruments. These instrumental techniques were, then, both metric and projective – to refer to William Ivins' two geometries again. The corporally felt knowledge of the craftsman was something difficult to theorise, and yet it seemed to be the technique that most often solved the two disciplines' spatial problems.

In the third and fourth chapters, on *graphic and verbal descriptions*, we saw how the practitioners used descriptions as a way of grappling with their two spaces and activities. In the third chapter I argued that graphic descriptions such as sketching, drawing, painting and photography, were used in two essentially different ways; first to provide information about the space and second, information about the activity. Historically, drawing had a fundamental role within architecture and the emergence of the architect as a professional, and although some climbing manuals also emphasised its role in training the mountaineer, the lack of drawing skills along with the growing popularity and portability of the camera, meant that the photograph inherited drawing's role in this discipline. Graphic descriptions were inherently related to the practice of learning to *see* by recording the form and shape of an object as well as the corporeal movements and thus it was an obvious way in which a better sense of, and understanding about, the space and the activity could develop. It was an alphabet of a visual language which both disciplines hoped would provide 'a general rule at a single glance', and the practice of recording three-dimensional form as a result trained their ability to recognise features in both two and three-dimensions.

Although the first chapter dealt with the role of theory, it did not examine the nature of the text itself, and this is what chapter four did. It also completes the enquiry in chapter three by looking at the two descriptive types together and the realisation that the one could not do without the other, that one could not use the text without the drawing nor the drawings without the text. Descriptive geometry, as we saw, allowed three-dimensional objects to be represented in two dimensions, by using a specific set of procedures. The climbing texts did not, like Delorme's text attempt to construct an object from these procedures, but attempted nevertheless to construct something else; it allowed the climbers to re-enact the space in its real dimension. In descriptive geometry all geometric aspects of the imaginary object are accounted for in true size and shape, and can be imaged (or imagined) as seen from any position in space. Delorme's trust in the written word lay predominantly within its ability to spread knowledge about its existence rather than as a conviction that it was alone able to train the stoneworkers. Increasingly throughout we found that both practitioners moved towards the idea of imitation and both found that instinct as well as imitation was as good as each other in learning principles and precedents through books. However, lengthy descriptions, repetition, boredom and spiritual trials awaited the readers of these books.

The fifth chapter, on *thinking*, explored how cognitive processes were employed as a tool in order to solve spatial problems and thus in turn be able to perform certain spatial activities. It also examined the ways in which these processes were employed in a quest to master both the space and the activity. Without making a distinct difference between different cognitive processes, the chapter examined the evidence within the two disciplines' texts of a consciousness around the use of such a practice, and what was clear throughout was the way in which cognitive methods had been overlooked as a technique in its own right. As a consequence, these techniques were not systematised into a theory nor given separate chapters in the instruction manuals, although its use was clearly visible and described throughout the texts. Nevertheless, the skills of memorising, imagining, picturing, visualising, folding and rotating in the mind - were all indispensable skills in their quest to gain a sense of mastery over the mountain or the building. The chapter made a connection between the training of the seeing eye in chapter three to what in this chapter would be referred to as the training of the mind's eye. The capacity to figure out through processes in the mind highly complex three-dimensional configurations without the need for other sources of imagery is a necessary and additional part of the role of 'the practical' and thus also for the two disciplines' sense of mastery.

The final chapter, on *the aesthetic,* showed a preoccupation with distinct mental pleasures, such as those derived from intellectual challenges. Unlike the previous chapters, it sought to understand what the driving forces behind the wish to master a craft was, and at the same time how this was connected to the perception of what beauty was. It examined forms of aesthetic appreciation that were more universally valid through concepts such as 'difficulty' and the 'unhomely', and that crossed many historical and disciplinary boundaries. The discussion drew upon ideas from the rationalist account of beauty as well as the notion of the immediacy thesis. The object of all these aesthetic concerns, were as we saw, lines, and both disciplines repeatedly described them as puzzles and that the enjoyment of them was to piece them together into a continuous 'design', the intellectual challenge being the main aim. The quest to *know* space was omnipresent throughout this chapter, and I argued that the climber had a better aesthetic understanding of space, one which the architect may find to hold many solutions to their constant grappling with space. Thus, I argued that aesthetics and climbing could improve architecture and the architectural experience, and that the two subjects should get more, not less, attention in architectural discourse.



44 Alain Robert climbing the 38 storey Investment Authority Tower, Abu Dhabi, 2003

Tentatively, I have therefore proposed that climbing may hold one of the keys, as it were, to the problems within architecture and thus also with the mastery of built space. Alain Robert, whilst planning to scale Chicago's Citicorp Citibank Centre, described for example how he during a number of days went to the building 'to study the structure, trying to *feel* the building, trying to *imagine* [his] movements, to estimate the *effort* necessary for such an escalation.'[635] In many ways, the process he describes is much the same as what an architect does when he designs a building. Before Alain began scaling buildings, he climbed mountains: 'Fissure escalation – the ascent of igneous, metamorphic or sedimentary rocks – has been my job for more than ten years. It's no problem; I've mastered it. [...] But it has to be said that scaling the window panes of a tall building is something else entirely.'[636] However, as soon as he started reconnoitring the building, all his knowledge and experience as a climber of rocks was applied directly to the building – giving him the ability to judge the building from a climber's point of view; one based upon *feel*ing, *imagin*ing and estimating *effort*.

[635] Robert, *With Bare Hands. The Story of the Human Spider*, p. 17
[636] Robert, *With Bare Hands. The Story of the Human Spider*, p. 10

To summarise, modes of mastery that have been identified here are theoretical, practical, graphic and verbal describing as well as processes of thought and the aesthetic. That is not to say that these are by any means *all* modes of mastery, I am sure there are more, all I have attempted to do is collect those modes which were most evident in the literature that this thesis have examined. Nor are they modes that operate singularly and in isolation from one another, despite the more defined boundaries between each that this thesis has presented. Ultimately, these thematically grouped investigations revealed firstly that, indeed, it is possible to see one practice through another and allow this process of weaving to reveal how interlacing threads can combine from such separate elements into one (hi)story. This was the methodological aim for this thesis and it is my hope that this method is also a contribution to knowledge and the way knowledge is created. It is not linear in the way a normal history is written, but it is yet a (hi)story that showed how two disciplines, during their emergence as professional disciplines that had distinct characteristics followed the same direction, and that it was not a historical period nor discipline that mattered, but simply the drive towards mastering a craft and a space that brought the two together.

The illegality of buildering, however, probably means that a similar body of knowledge will never be written about this craft. Nevertheless, we saw how Alain Robert was able to apply his skills as a climber on rocks to the climbing of buildings – and his experience of the building is one that the architects of such buildings can only aspire to unless they themselves climbed their own buildings. I am neither promoting the climbing of buildings nor suggesting that buildering should be examined as a craft such as those examined in this project, but the example of buildering does stand as a good example that is able to summarise all that this thesis has been about in a single word; buildering. The project could have taken a different path, as for example that of Richard Sennett who studied the concept of the craftsman in general.[637] However, despite this relatively broad study of crafts, it is nevertheless its aim to stay close to architecture and the built environment. The closest of disciplines that perpetually brought architecture to mind was mountaineering, and thus the two have conjoined accordingly throughout. The quest to master their space and spatial activities having brought them together into a coherent whole.

[637] See Richard Sennett, *The Craftsman* (London: Allen Lane, 2008)

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Appendix

Correspondences with climbers: extracts

Email correspondence with Martin Moran

19th August – 17th September 2008

AKN: What is involved in planning a route/line up the mountain? Would you say that in choosing your routes/lines up a mountain, the aesthetics of this line is ever of any importance in choosing it?

MM: On an unclimbed mountain (i.e. in the Himalaya) practicality is the deciding factor on route line rather than aesthetics. The most alluring route may not be the easiest or else may look too hard for one's party. The most important thing is to reach the summit. Occasionally, the natural aesthetic line is also the most practical. Such routes give the best mountaineering experiences imaginable. If the mountain is beautiful then the details of the route line are less important. Just to reach the top is satisfaction enough. In picking a new route on a mountain cliff (i.e. a Scottish winter climb) aesthetics are all important. I am attracted to beautiful lines – obvious geological weaknesses or complex linkages of features. If there is no architectural stimulation then I am much less interested. I have done poor new routes that I wish I hadn't bothered with. I like to see new route lines in Scotland with my own eyes. The thrill of seeing a possible new line gives the inspiration to train hard and come back to try the climb. In the Himalayas I trawl through journal photographs looking for something appealing. When climbing a new route I may deviate in order to find the easiest line. However, major deviations detract from the quality of the climb. A short deviation to get round a blank section can be seen as masterly and adds to route quality. However, if the line starts wandering around with horizontal deviations more than 15% of the route length then quality drops and eventually the whole exercise can seem pointless.

Do you have any thoughts on why climbing this natural aesthetic line creates such experiences? What would you say the main attractions are for climbing the Direttissima?

I suppose that like other perceptive humans climbers are susceptible to the beauty of geometric form and proportion. The feeling of climbing a beautiful line is much enhanced. The quality of climbing is nearly always good on a natural line, but more than this the sensations of pleasure, surprise and privilege are so much greater. The "direttissima" syndrome can have several motivations. One is the conquistadorial desire to tame the mountain. Another is the egotistic ambition to climb the hardest and most direct line on a peak - the line that no-one else can surpass. As a result many direttissimas do not take natural lines; they avoid any natural deviating features in pursuit of the plumb-line and may cross several easier lines. Such routes have the attraction of great technical difficulty but little else. A third reason for pursuit of the "direttissima" is that many direct lines are indeed the most natural and appealing. The Walker Spur is a perfect example where directness and natural architecture of a line meet in perfection. Big ice lines in Norway also come to mind. When you see a 500

metre vertical frozen waterfall you see a single feasible line which coincides with the stunning beauty of a natural feature.

Email correspondence with John Middendorf

22nd August-22nd September 2008

AKN: What is involved in selecting a line up the mountain (or a big wall)? Would you say that in choosing your routes/lines up a mountain, the aesthetics of this line is ever of any importance in choosing it?

JM: The aesthetic of the climbing line, particularly on new routes, has always been very important to me. On climbs around the world, some of the routes I established were already populated with a lot of other routes (El Capitan, Half Dome), some of the cliffs were relatively "virgin" (Zion, Wind Rivers, Great Trango), and others were unclimbed narrow pinnacles in which the line of least resistance was the obvious solution. Always, the line in the context of the existing natural features was key to my perception of the beauty of the climb. Two schools of thought seem to be prevalent in the rock climbing world, typified by early pioneers in the sport. Royal Robbins was a proponent of finding the most natural line, the one that required the fewest "unnatural" placements of equipment to create a passage to the top. Cracks, corners and flakes, that are visible with the naked eye from afar, are the most obvious "natural" features, however, sometimes even seemingly blank rock can be very featured allowing "natural' passage if there are a lot of generally horizontal small ledges that make the section climbable. Warren Harding, on the other hand, has often been characterized as someone who chose bold yet sometimes "unnatural" lines, in the sense that his major routes often required extensive bolting up blank rock. He would choose routes that followed spectacular lines of the cliffs, but not always ones that had followed natural features. His 1971 route, the Wall of the Early Morning Light, took required over 300 drilled placements to establish.

At the time routes on El Capitan required on the order of 13 to 50 or so drilled placements to establish, and still today, there are very few routes that have required that many bolts. One could argue that in both camps are distinguishing relatively fine lines when it comes to establishing rock climbs, as they are both using an assortment of mechanical tools to establish a route to the top. Yet in the end there is a definite difference in terms of how much impact, alteration of natural features, and the use of "unnatural" permanent anchors, such as the number of drilled holes. In this context, I'll term Robbin's style as the "macroscopic" approach, and Harding's as a "photogenic" approach. While proponents of the macroscopic approach may also be looking for a photogenic result, and proponents of the photogenic approach may also be striving to find natural features, the terminology refers to the priority of the style. My style followed more of the macroscopic approach. I enjoyed the puzzle aspect of piecing together discontinuous features in order to climb with the least permanent impact. In Yosemite, my first major new route, the Atlantic Ocean Wall, followed a series of natural flakes and features up a buttress in the middle of the otherwise very overhanging SouthEast face of El Capitan.

I knew this section was less steep than the rock to the right and the left of it only from climbing neighbouring routes, which led me initially to the belief that a route was possible in this area. With this informational advantage, I then proceeded to study the actual features for months prior to the ascent. I found it very important to view the stone from varying positions in the meadow below, at various times of day,

and at various scales. By scales I refer to viewing the line at the scale of the naked eye, the scale of 30X binoculars, and the scale of a Celestron Telescope. All of these "views" were important to discover the optimal "line". Of particular note is how features that were invisible, say, in the morning light, then became clear in the afternoon light, due to the shadow created (or not) by the angle of the sun. A paper map was then created, with occasional "options" in the route. The map was essential as the perspective on the rock is often very limited due to the varying curvature of the rock's surface, and the map would be needed to properly connect each feature with the next feature. So there you have a brief introduction of my thoughts on the "climbing line". Back in the day, I had a reputation of being able to find good lines that were aesthetic and required the minimal use of bolts. A personal side thought, one that I have never seen openly discussed, is that the many "old-school" climbers who have a strong aversion to the sport's collective drilling into rock, perhaps have the same primal aversion to disrupting the earth in the same context as the Gaia theory, much like the Hopis have an aversion to disturbing the earth's soil and thus only dry-farm (instead of ploughing, the Hopis traditionally hand place seeds in between natural folds of the soil).

Does the line exist as an idea in your mind whilst you are climbing it?

Yes, the idea of the line is cemented in the climber's mind, prior and during the ascent. This applies mostly to longer routes, those that [...] would otherwise not be wholly visible from the perspective of the climber on the rock due to the varying curvature. Of course, on shorter routes, climbing a stupendous arête, for example, would not require the "view from a distance" to recognize the line. Sometimes climbers fall in love with the line, or the idea of a line. A good photo from a book or a magazine of a face in the Alps or the Himalaya can become an object of lust for a climber. In this case the "photogenic" line is what creates the appeal, as generally in a photograph it is impossible to see the myriad of features that become visible upon actually inspection in person. My feelings is that yes, when climbing a long route, the line is the passage, and thus becomes the object of focus. Features along the way are always of course interesting, but it is really the overall path of the ascent that is embedded in the climber's mind as the journey at hand.

Email correspondence with Ben Heason

30th June – 5th August 2008

AKN: Do you do any form of 'recording' your climbs whilst you are training on them? Say, for example, draw diagrams or maps of either the mountain/rock or the different moves up it?

BH: 'When I first became quite serious about my climbing, and started attempting harder climbs, I did used to use various methods to record my climbs in order to help me remember them. I would go climbing, attempt the climb, then go home. At home I would then attempt to recreate the climb, in as much detail as I could with a picture diagram, detailing every single hand and foot hold (and gear placements where necessary), and number each hold in the order of the sequence I used them in. Next time I went back to the climb I would assess how accurate my "memory" of the climb had been. I would repeat this several times, or until I had the route "wired" in my mind. As I improved at climbing, so did my mental imagery. I found that I could remember sequences and specific gear placements much better so the need to actually draw diagrams or write words as reminders became less important.'

Are there any aesthetic choices taken in route-selection?

Yes, for me the aesthetics of the line of the climb are definitely important. Not always of course but, for example, when I first visit a new climbing area, my priority is nearly always to do the best, most classic routes of the area. These often, rightly so, tend to be the most striking lines, such as the arêtes and corners, which are continuous lines from bottom to top. They are the purest lines and they do certainly attract my desires more than a wandering line. The aesthetics are more important than the difficulty.

So the aesthetic choice is more important only when the climb is new to you?

No, the aesthetics of a line is always more important to me, ie an arête or a corner. Not just when it is a new route. I am not so motivated by simply tackling the plumb line just for the sake of it. If it looks like "an obvious line" to me, when looking from the ground then that is what attracts me the most. I will not simply look to climb in a straight line to the top, regardless of the quality of the climbing and, much more importantly, the logic of the line. The line should be logical. To miss out a hold which is just within arms length, just to give a harder route, lessens the experience of that route for me. Eliminates (which are normally harder by virtue of missing out certain holds or sections of the cliff) should, in my opinion, only be climbed after all the obvious lines around it have been done first. They should take priority, not the hard line just because it is hard. This does not necessarily make a good climb just because it is hard, but it can do sometimes of course. It's difficult to try to explain why a pure line, such as an arête is more appealing than a wandering line, it seems too obvious to me – it just stands out and asks to be climbed. They simply catch the eye more strongly therefore giving you a stronger urge to climb them. The aesthetics of the line are the primary motivation, the difficulty of the climbing is secondary.

What would say the attraction of doing a Direttissima is?

My interest in this kind of line depends entirely on where I am climbing. In some circumstances it seems appropriate to me, but in others it seems utterly silly. For example, when I climbed Angel Falls in Venezuela, we most definitely took the line of least resistance up the 1,000m wall. That was still very difficult anyway, but to have sought out the hardest looking line would have seemed pointless. (And it would have probably been impossible to have climbed it anywhere else anyway, so ours was maybe the direttissima and the easiest line. On the smaller, more local rock climbing crags around Sheffield there are so many routes squeezed in together, some only 1m apart from the next one. But, even though they are so close, the climbing can often vary wildly, in terms of both difficulty and seriousness. So, for us here in the UK – where most of our rock has been climbed – I am more motivated to fill in the remaining gaps to create new routes. These will often tend to be the hardest way up that section of wall. But I am only really motivated to do the Direttissima after all the other more obvious, easier lines have been climbed. For some people I think this is not the case, but for me climbing is about going the obvious way up, the challenge is secondary. If the direttissima is the only challenge left on a section of cliff, then so be it, I will be motivated to try it. The attraction of climbing a direttissima is that you can be proud that you have climbed the hardest section of that cliff. For certain the best situation is when the hardest line is also the easiest line. I.e., it's the only way. For sure that is what motivates me the most. For me, quality is much, much, much more important than difficulty, but I think this is not always the case with elite climbers.

Email correspondence with Neil Gresham

2nd - 11th August 2008

AKN: Do you do any form of 'recording' your climbs whilst you are training on them? Say, for example, draw diagrams or maps of either the mountain/rock or the different moves up it?

NG: I draw topo plans of the route, with all handholds, footholds, rests and clips marked +also relevant prompts for each move. This tends to be for hard redpoints (eg 8b and above). They serve the purpose of helping to engrain all aspects of the sequence.

Do you find that you can memorize all the hand and footholds of a climb after you have climbed it a few times and no longer need the topo plans?

I know for sure that the ability to remember moves comes with practice. Some of the most intelligent people who I coach (Doctors, Lawyers, Bankers) can't remember more than 2 moves at a time. I find that I can remember up to 20 hand moves at a time having only been through them twice. I could probably remember hand 40 moves if I went through it 4times. Foot moves are a different story - it takes a lot of practice on the route itself to be able to remember how these tie in with the hand sequence. If I'm reading an onsight from the ground it will be more 2D, if it is a redpoint (ie: I've actually climbed on the route before) then it will be more 3D -ie: body awareness rather than just the plan of the holds.'

Email correspondence with Dave MacLeod

28th-29th June 2008

AKN: Do you do any form of 'recording' your climbs whilst you are training on them? Say, for example, draw diagrams or maps of the different moves up it?

DM: I just remember the moves in my head, but I play moves back in my head so often I don't even realise I'm doing it. Of course I spend a lot of time thinking consciously about it, but also a lot of the time 'background processing'. The only thing I've ever drawn out was the gear placements on a winter route called 'The Hurting'. I could remember the moves no problem, but seemed to have problems remembering which piece of gear went where. Maybe that's significant? I'm thinking about doing the same on the route I'm trying now on Ben Nevis. It's easier for me to remember maybe 300 or more foot moves than 14 gear placements in the right order. I'm not sure why?

So you must make a mental 'map? When you do the 'background processing', does that involve mental imagery of your arms and legs, or what does that involve exactly?

I'm not much good at remembering simple stuff like phone numbers or what day it is etc but when it comes to moves I can definitely remember them. Sometimes I can remember how my climbing partners did the moves on a route several years ago when they have forgotten. Yes it's definitely a mental map or moves. I can play it back either 'inside' myself as if I was climbing it, or from 'outside' as if I was watching myself. I also find I can improve my sequence by doing this i.e. I can discover a way to climb a sequence more efficiently by playing back the different options the hand and footholds offer without being on the route to try it. Quite often when I go back to the route and try it out, it works. This used to be a clear, mechanical process but now it

feels more 'neural'. So sometimes I'm not totally sure why the move will work better a certain way, but when I try it, it does.

Email correspondence with Steve McClure

2nd – 23rd August 2008

AKN: *Do you do any form of 'recording' your climbs whilst you are training on them? Say, for example, draw diagrams or maps of either the mountain/rock or the different moves up it?*

SM: '[...] with long term projects, like taking 20 days or so I do make a plan of the route with a little map showing all the holds, and dotted lines showing movement of left hand, RH, RF, LF. This is partly a memory thing in case I end up not on it for ages, but also part of the process of becoming one with the route, letting it all sink in and learning all the subtle movements. Its even possible to see things while making the map, like why did I use my left hand here rather than my right etc'

Do you ever think of climbing something in terms of it being 'the straightest possible line up a wall'? Are there any aesthetic choices taken in route-selection?

Climbers are drawn towards the line, myself I always am inspired by obvious lines, but they don't have to be straight. Probably a straight line would have slightly more appeal over one with bends in it, but not necessarily. There is however always some aesthetic choices in route selection, it is definitely not just to do with difficulty for me. I am inspired by obvious natural features (not necessarily straight), like corners, grooves, cracks etc, any series of features that lead from bottom to top, ideally one feature that goes the whole way.